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As filed with the Securities and Exchange Commission on April 5, 2019

Registration No. 333-

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM S-4
REGISTRATION STATEMENT
UNDER

THE SECURITIES ACT OF 1933

GTx, Inc.
(Exact name of Registrant as specified in its charter)

Delaware	2834	62-1715807
(State or other jurisdiction of incorporation or organization)	(Primary Standard Industrial Classification Code Number)	(I.R.S. Employer Identification Number)

GTx, Inc.
17 W Pontotoc Ave., Suite 100
Memphis, TN 38103
(901) 523-9700
(Address including zip code, and telephone number, including area code, of Registrant's principal executive offices)

Marc S. Hanover
Chief Executive Officer
GTx, Inc.
17 W Pontotoc Ave., Suite 100, Memphis, TN 38103
(901) 523-9700
(Name, address, including zip code, and telephone number, including area code, of agent for service)

Copies to:

Henry P. Doggrell	Chadwick Mills	James B. Breitmeyer, M.D., Ph.D.	Cheston J. Larson
Vice President, Chief Legal Officer and Secretary	Laura Medina	President & Chief Executive Officer	Matthew T. Bush
GTx, Inc.	John T. McKenna	Oncternal Therapeutics, Inc.	Anthony A. Gostanian
17 W Pontotoc Ave. Suite 100	Cooley LLP	11750 Sorrento Valley Road Suite 250	Latham & Watkins LLP
Memphis, TN 38103	101 California Street, 5th Floor	San Diego, CA 92121	12670 High Bluff Drive
(901) 523-9700	San Francisco, CA 94111-5800	(858) 434-1113	San Diego, California 92130
	(415) 693-2000		(858) 523-5400

Approximate date of commencement of proposed sale to the public: As soon as practicable after the effectiveness of this registration statement and the satisfaction or waiver of all other conditions under the Merger Agreement described herein.

If the securities being registered on this Form are being offered in connection with the formation of a holding company and there is compliance with General Instruction G, please check the following box. ☐

If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

If this Form is a post-effective amendment filed pursuant to Rule 462(d) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	☐	Accelerated filer	☒
Non-accelerated filer	☐	Smaller reporting company	☒
		Emerging growth company	☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 7(a)(2)(B) of the Securities Act. ☐

If applicable, place an X in the box to designate the appropriate rule provision relied upon in conducting this transaction:

Exchange Act Rule 13(e)-4(i) (Cross-Border Issuer Tender Offer) ☐

Exchange Act Rule 14d-1(d) (Cross-Border Third-Party Tender Offer) ☐

CALCULATION OF REGISTRATION FEE

Title of Each Class of Security Being Registered	Amount to be Registered(1)	Proposed Maximum Offering Price Per Share	Proposed Maximum Aggregate Offering Price(2)	Amount of Registration Fee(3)
Common stock, $0.001 par value per share	77,972,568	N/A	$16,957,000	$2,056

(1) Relates to common stock, $0.001 par value per share, of GTx, Inc., a Delaware corporation ("GTx"), issuable to holders of common stock, $0.0001 par value per share, and warrants and options of Oncternal Therapeutics, Inc., a Delaware corporation ("Oncternal"), in the proposed merger of Grizzly Merger Sub, Inc., a Delaware corporation and a wholly-owned subsidiary of GTx, with and into Oncternal (the "merger"). The amount of GTx's common stock to be registered is based on the estimated number of shares of GTx's common stock that are expected to be issued pursuant to the merger, before taking into account the effect of a reverse stock split of GTx's common stock, assuming a pre-split exchange ratio of 0.4474 shares of GTx's common stock for each outstanding share of Oncternal common stock and for each option and warrant exercisable for shares of Oncternal capital stock.

(2) Estimated solely for purposes of calculating the registration fee in accordance with Rule 457(f) of the Securities Act of 1933, as amended, based upon the estimated book value of the Oncternal securities to be exchanged in the merger, as of after the conversion of Oncternal preferred stock into Oncternal common stock and immediately prior to the merger. Oncternal is a private company, and no market exists for its securities.

(3) This fee has been calculated pursuant to Section 6(b) of the Securities Act of 1933, as amended.

The Registrant hereby amends this registration statement on such date or dates as may be necessary to delay its effective date until the Registrant shall file a further amendment that specifically states that this registration statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act of 1933, as amended, or until the registration statement shall become effective on such date as the Securities and Exchange Commission, acting pursuant to said Section 8(a), may determine.

The information in this proxy statement/prospectus/information statement is not complete and may be changed. GTx may not sell its securities pursuant to the proposed transactions until the Registration Statement filed with the Securities and Exchange Commission is effective. This proxy statement/prospectus/information statement is not an offer to sell these securities and is not soliciting an offer to buy these securities in any state where the offer or sale is not permitted.

Subject to completion, dated April 5, 2019

PROPOSED MERGER
YOUR VOTE IS VERY IMPORTANT

To the Stockholders of GTx, Inc. and Oncternal Therapeutics, Inc.:

GTx, Inc. ("GTx") and Oncternal Therapeutics, Inc. ("Oncternal") have entered into an Agreement and Plan of Merger and Reorganization (the "Merger Agreement") pursuant to which a wholly-owned subsidiary of GTx will merge with and into Oncternal, with Oncternal surviving as a wholly-owned subsidiary of GTx (the "merger"). Oncternal and GTx believe that the merger will result in a clinical-stage biopharmaceutical company focused on developing first-in-class product candidates for cancers with critical unmet medical need.

At the effective time of the merger (the "Effective Time"), each share of common stock of Oncternal, $0.0001 par value ("Oncternal common stock") will be converted into the right to receive approximately 0.4474 shares of GTx's common stock, subject to adjustment for the reverse stock split of GTx's common stock to be implemented prior to the consummation of the merger as discussed in this proxy statement/prospectus/information statement. This exchange ratio is an estimate only as of the date hereof and the final exchange ratio will be determined pursuant to a formula described in more detail in the Merger Agreement and in the attached proxy statement/prospectus/information statement. Prior to the Effective Time each share of preferred stock, $0.0001 par value, of Oncternal ("Oncternal preferred stock" and, together with the Oncternal common stock, "Oncternal capital stock"), will be converted into one share of Oncternal common stock in accordance with the applicable provisions of Oncternal's certificate of incorporation. GTx will assume outstanding and unexercised warrants and options to purchase shares of Oncternal capital stock, and in connection with the merger they will be converted into warrants and options, as applicable, to purchase shares of GTx's common stock. At the Effective Time, GTx's stockholders will continue to own and hold their existing shares of GTx's common stock, and all outstanding and unexercised options to purchase shares of GTx's common stock and outstanding and unexercised warrants to purchase shares of GTx's common stock will remain in effect pursuant to their terms, except that the vesting of such options will be accelerated in full effective as of immediately prior to the Effective Time. Immediately after the merger, assuming an exchange ratio of 0.4474, Oncternal's stockholders as of immediately prior to the Effective Time will own approximately 75% of the outstanding capital stock of GTx, with GTx's stockholders as of immediately prior to the Effective Time owning approximately 25% of the outstanding capital stock of GTx. The exchange ratio formula excludes Oncternal's outstanding stock options and warrants and GTx's outstanding stock options and warrants. These estimates are subject to adjustment prior to closing of the merger.

Shares of GTx's common stock are currently listed on the Nasdaq Capital Market ("Nasdaq") under the symbol "GTXI." Prior to consummation of the merger, GTx intends to file an initial listing application with Nasdaq pursuant to Nasdaq's "reverse merger" rules. After completion of the merger, GTx will be renamed Oncternal Therapeutics, Inc. and expects to trade on Nasdaq under the symbol "ONCT." On , 2019, the last trading day before the date of this proxy statement/prospectus/information statement, the closing sale price of GTx's common stock on Nasdaq was $ per share.

GTx is holding a special meeting of its stockholders (the "GTx special meeting") in order to obtain the stockholder approvals necessary to complete the merger and related matters. At the GTx special meeting, which will be held at a.m., Central time, on , 2019 at 17 W Pontotoc Ave., Suite 100, Memphis, Tennessee 38103, unless postponed or adjourned to a later date, GTx will ask its stockholders to, among other things:

1. approve the Merger Agreement, and the transactions contemplated thereby, including the merger, the issuance of shares of GTx's common stock to Oncternal's stockholders pursuant to the terms of the Merger Agreement and the change of control resulting from the merger;
2. approve an amendment to the restated certificate of incorporation of GTx to effect a reverse stock split of GTx's common stock, within a range, as determined by GTx's board of directors, of one new share for every to (or any number in between) shares outstanding;
3. approve an amendment to the restated certificate of incorporation of GTx to change the corporate name of GTx from "GTx, Inc." to "Oncternal Therapeutics, Inc.";

4. approve the adoption of the GTx, Inc. 2019 Incentive Award Plan;
5. approve, on a nonbinding, advisory basis, the compensation that will be paid or may become payable to GTx's named executive officers in connection with the merger;
6. consider and vote upon an adjournment of the GTx special meeting, if necessary, to solicit additional proxies if there are not sufficient votes in favor of Proposal Nos. 1 or 2; and
7. transact such other business as may properly come before the GTx special meeting or any adjournment or postponement thereof.

As described in the accompanying proxy statement/prospectus/information statement, certain of Oncternal's stockholders who in the aggregate own approximately 44% of the outstanding shares of Oncternal capital stock on an as converted to common stock basis, and certain of GTx's stockholders who in the aggregate own approximately 45% of the outstanding shares of GTx's common stock, are parties to voting agreements with GTx and Oncternal, whereby such stockholders have agreed to vote their shares, in favor of the adoption or approval, among other things, of the Merger Agreement and the approval of the transactions contemplated therein, including the merger, the issuance of shares of GTx's common stock to Oncternal's stockholders and the change of control resulting from the merger, subject to the terms of the voting agreements.

In addition, following the registration statement on Form S-4, of which this proxy statement/prospectus/information statement is a part, being declared effective by the U.S. Securities and Exchange Commission (the "SEC") and pursuant to the conditions of the Merger Agreement and the voting agreements, Oncternal's stockholders who are party to the voting agreements will each execute an action by written consent of Oncternal's stockholders, referred to as the written consent, adopting the Merger Agreement, thereby approving the transactions contemplated therein, including the merger. No meeting of Oncternal's stockholders to adopt the Merger Agreement and approve the merger and related transactions will be held; all of Oncternal's stockholders will have the opportunity to elect to adopt the Merger Agreement, thereby approving the merger and related transactions, by signing and returning to Oncternal a written consent.

After careful consideration, GTx's board of directors (the "GTx Board") has (i) determined that the merger and all related transactions contemplated by the Merger Agreement are fair to, advisable and in the best interests of GTx and its stockholders, (ii) approved and declared advisable the Merger Agreement and the transactions contemplated therein and (iii) determined to recommend, upon the terms and subject to the conditions set forth in the Merger Agreement, that its stockholders vote to approve the Merger Agreement and the transactions contemplated thereby. The GTx Board recommends that GTx's stockholders vote "FOR" Proposal Nos. 1, 2, 3, 4, 5 and 6.

After careful consideration, Oncternal's board of directors (the "Oncternal Board") has (i) determined that the merger and all related transactions contemplated by the Merger Agreement are fair to, advisable and in the best interests of Oncternal and its stockholders, (ii) approved and declared advisable the Merger Agreement and the transactions contemplated therein and (iii) determined to recommend, upon the terms and subject to the conditions set forth in the Merger Agreement, that its stockholders vote to approve the Merger Agreement and the transactions contemplated thereby. The Oncternal Board recommends that Oncternal's stockholders sign and return the written consent, indicating their (i) adoption and approval of the Merger Agreement and the transactions contemplated thereby, (ii) acknowledgement that the approval given is irrevocable and that such stockholder is aware of its rights to demand appraisal for its shares pursuant to Section 262 of the General Corporation Law of the State of Delaware ("DGCL"), and that such stockholder has received and read a copy of Section 262 of the DGCL, (iii) acknowledgement that by its approval of the Merger it is not entitled to appraisal rights with respect to its shares in connection with the Merger and thereby waives any rights to receive payment of the fair value of its capital stock under the DGCL, and (iv) approval of the conversion of Oncternal's outstanding preferred stock into Oncternal's common stock immediately prior to the Effective Time (collectively, the "Required Oncternal Stockholder Approval").

More information about GTx, Oncternal and the proposed transaction is contained in this proxy statement/prospectus/information statement. GTx and Oncternal urge you to read the accompanying proxy statement/prospectus/information statement carefully and in its entirety. IN PARTICULAR, YOU SHOULD CAREFULLY CONSIDER THE MATTERS DISCUSSED UNDER "RISK FACTORS" BEGINNING ON PAGE 26.

GTx and Oncternal are excited about the opportunities the merger brings to both GTx's and Oncternal's stockholders, and thank you for your consideration and continued support.

Marc S. Hanover
Chief Executive Officer
GTx, Inc.

James B. Breitmeyer, M.D., Ph.D.
President & Chief Executive Officer
Oncternal Therapeutics, Inc.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or passed upon the adequacy or accuracy of this proxy statement/prospectus/information statement. Any representation to the contrary is a criminal offense.

The accompanying proxy statement/prospectus/information statement is dated , 2019, and is first being mailed to GTx's and Oncternal's stockholders on or about , 2019.

GTX, INC.
17 W Pontotoc Ave., Suite 100
Memphis, Tennessee 38103
(901) 523-9700

NOTICE OF SPECIAL MEETING OF STOCKHOLDERS
TO BE HELD ON , 2019

Dear Stockholders of GTx:

On behalf of the board of directors of GTx, Inc., a Delaware corporation ("GTx"), we are pleased to deliver this proxy statement/prospectus/information statement for the 2019 special meeting of stockholders of GTx and for the proposed merger between GTx and Oncternal Therapeutics, Inc., a Delaware corporation ("Oncternal"), pursuant to which Grizzly Merger Sub, Inc., a Delaware corporation and a wholly-owned subsidiary of GTx ("Merger Sub"), will merge with and into Oncternal, with Oncternal surviving as a wholly-owned subsidiary of GTx. The special meeting of stockholders of GTx will be held on , 2019 at a.m., Central time, at 17 W Pontotoc Ave., Suite 100, Memphis, Tennessee 38103, for the following purposes:

1. To consider and vote upon a proposal to approve the Agreement and Plan of Merger and Reorganization, dated as of March 6, 2019, by and among GTx, Merger Sub, and Oncternal, a copy of which is attached as *Annex A* to this proxy statement/prospectus/information statement (the "Merger Agreement"), and the transactions contemplated thereby, including the merger, the issuance of shares of GTx's common stock to Oncternal's stockholders pursuant to the terms of the Merger Agreement and the change of control resulting from the merger.
2. To approve an amendment to the restated certificate of incorporation of GTx to effect a reverse stock split of GTx's common stock, within a range, as determined by GTx's board of directors, of one new share for every to (or any number in between) shares outstanding, in the form attached as *Annex D* to this proxy statement/prospectus/information statement.
3. To approve an amendment to the restated certificate of incorporation of GTx to change the corporate name of GTx from "GTx, Inc." to "Oncternal Therapeutics, Inc." in the form attached as *Annex E* to this proxy statement/prospectus/information statement.
4. To approve the adoption of the GTx, Inc. 2019 Incentive Award Plan in the form attached as *Annex F* to this proxy statement/prospectus/information statement.
5. To approve, on a nonbinding, advisory basis, the compensation that will be paid or may become payable to GTx's named executive officers in connection with the merger.
6. To consider and vote upon an adjournment of the GTx special meeting, if necessary, to solicit additional proxies if there are not sufficient votes in favor of Proposal Nos. 1 or 2.
7. To transact such other business as may properly come before the GTx special meeting or any adjournment or postponement thereof.

The GTx Board has fixed , 2019, as the record date for the determination of stockholders entitled to notice of, and to vote at, the GTx special meeting and any adjournment or postponement thereof. Only holders of record of shares of GTx's common stock at the close of business on the record date are entitled to notice of, and to vote at, the GTx special meeting. At the close of business on the record date, GTx had shares of common stock outstanding and entitled to vote.

Your vote is important. The affirmative vote of the holders of a majority of the shares of GTx's common stock entitled to vote and present in person or represented by proxy at the GTx special meeting is required for approval of Proposal Nos. 1, 4, 5 and 6. The affirmative vote of the holders of a majority of shares of GTx's common stock having voting power outstanding on the record date for the GTx special meeting is required for approval of Proposal Nos. 2 and 3. Each of Proposal Nos. 1 and 2 are conditioned upon each other. Therefore, the merger cannot be consummated without the approval of Proposal Nos. 1 and 2.

Proposal Nos. 3 and 4 are conditioned upon the consummation of the merger. If the merger is not completed or the stockholders do not approve Proposal No. 3, GTx will not change its name to "Oncternal Therapeutics, Inc." If the merger is not completed or the stockholders do not approve Proposal No. 4, the GTx, Inc. 2019 Incentive Award Plan will not become effective. Proposal Nos. 1 and 2 are not conditioned on Proposal No. 3 or Proposal No. 4 being approved.

Even if you plan to attend the GTx special meeting in person, GTx requests that you sign and return the enclosed proxy to ensure that your shares will be represented at the GTx special meeting if you are unable to attend.

THE GTX BOARD HAS DETERMINED AND BELIEVES THAT EACH OF THE PROPOSALS OUTLINED ABOVE IS ADVISABLE TO, AND IN THE BEST INTERESTS OF, GTX AND ITS STOCKHOLDERS AND HAS APPROVED EACH SUCH PROPOSAL. THE GTX BOARD RECOMMENDS THAT GTX'S STOCKHOLDERS VOTE "FOR" EACH SUCH PROPOSAL.

By Order of the GTx Board of Directors,

Marc S. Hanover
Chief Executive Officer
Memphis, Tennessee
, 2019

REFERENCES TO ADDITIONAL INFORMATION

This proxy statement/prospectus/information statement incorporates important business and financial information about GTx that is not included in or delivered with this document. You may obtain this information without charge upon your written or oral request by contacting the Chief Legal Officer of GTx, Inc., 17 W Pontotoc Ave., Suite 100, Memphis, Tennessee 38103 or by calling (901) 523-9700.

To ensure timely delivery of these documents, any request should be made no later than , 2019 to receive them before the special meeting.

For additional details about where you can find information about GTx, please see the section entitled “Where You Can Find More Information” in this proxy statement/prospectus/information statement.

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QUESTIONS AND ANSWERS ABOUT THE MERGER

Except where specifically noted, the following information and all other information contained in this proxy statement/prospectus/information statement does not give effect to the proposed reverse stock split within a range, as determined by GTx's board of directors, of one new share for every to (or any number in between) shares outstanding, as described in Proposal No. 2 beginning on page 189 in this proxy statement/prospectus/information statement (the "GTx Reverse Stock Split").

The following section provides answers to frequently asked questions about the merger. This section, however, provides only summary information. For a more complete response to these questions and for additional information, please refer to the cross-referenced sections.

Q: What is the merger?

A: GTx, Merger Sub and Oncternal entered into the Merger Agreement on March 6, 2019. The Merger Agreement contains the terms and conditions of the proposed merger of GTx and Oncternal. Under the Merger Agreement, Merger Sub will merge with and into Oncternal, with Oncternal surviving as a wholly-owned subsidiary of GTx. This transaction is referred to as "the merger."

At the effective time of the merger (the "Effective Time"), each share of Oncternal's common stock immediately prior to the Effective Time (excluding certain shares to be canceled pursuant to the Merger Agreement, and shares held by stockholders who have exercised and perfected appraisal rights as more fully described in the section entitled "The Merger—Appraisal Rights" below) will be converted into the right to receive approximately 0.4474 shares of GTx's common stock, subject to adjustment for the GTx Reverse Stock Split (the "exchange ratio"). Prior to the Effective Time, all outstanding shares of Oncternal's preferred stock will convert into shares of Oncternal's common stock. This exchange ratio is an estimate only and the final exchange ratio will be determined pursuant to a formula described in more detail in the Merger Agreement and in the attached proxy statement/prospectus/information statement.

As a result of the merger, based on the estimated exchange ratio of 0.4474, current holders of Oncternal's capital stock are expected to own in the aggregate approximately 75% of the outstanding capital stock of GTx, with GTx's current stockholders owning approximately 25% of the outstanding capital stock of GTx. The ownership percentage to be held by GTx's stockholders is subject to adjustment prior to closing of the merger, including a downward adjustment to the extent that GTx's "Parent Cash Amount" (as defined in the Merger Agreement) at the Effective Time is less than the threshold provided in the Merger Agreement, which adjusts based on the date of closing (and as a result, GTx stockholders could own less, and Oncternal stockholders could own more, of the combined company), an upward adjustment to the extent that GTx's Parent Cash Amount at the Effective Time is greater than the threshold provided in the Merger Agreement, which adjusts based on the date of closing (and as a result, GTx stockholders could own more, and Oncternal stockholders could own less, of the combined company), or an upward adjustment to the extent that Oncternal's "Company Cash Amount" (as defined in the Merger Agreement) at the Effective Time is less than $10,500,000 (and as a result, GTx stockholders could own more, and Oncternal stockholders could own less, of the combined company). The exchange ratio formula excludes Oncternal's outstanding stock options and warrants and GTx's outstanding stock options and warrants. GTx will assume outstanding and unexercised warrants and options to purchase shares of Oncternal capital stock, and such securities will be converted into warrants and options, as applicable, to purchase shares of GTx's common stock.

At the Effective Time, GTx's stockholders will continue to own and hold their existing shares of GTx's common stock, and all outstanding and unexercised options to purchase shares of GTx's common stock and outstanding and unexercised warrants to purchase shares of GTx's common stock will remain in effect pursuant to their terms, except that the vesting of such options will be accelerated in full effective as of immediately prior to the Effective Time. After the completion of the merger, GTx will change its corporate name to "Oncternal Therapeutics, Inc." as required by the Merger Agreement (the "GTx Name Change").

Q: Whatwill happen to GTx if, for any reason, the merger does not close?

A: If, for any reason, the merger does not close, the GTx Board may elect to, among other things, attempt to complete another strategic transaction like the merger, attempt to sell or otherwise dispose of the various assets of GTx, resume its research and development activities and continue to operate the business of GTx or dissolve and liquidate its assets. If GTx decides to dissolve and liquidate its assets, GTx would be required to pay all of its debts and contractual obligations, and to set aside certain reserves for potential future claims. There can be no assurances as to the amount or timing of available cash left to distribute to stockholders after paying the debts and other obligations of GTx and setting aside funds for reserves.

If GTx were to continue its business, it would need to hire scientific personnel necessary to resume research and development activities. To conserve its cash resources, GTx has substantially reduced its workforce since November 2018 and has ceased its selective androgen receptor modulators ("SARM") development activities and all other operations except for day-to-day business operations, completing ongoing mechanistic selective androgen receptor degrader ("SARD") preclinical studies and those activities necessary to complete the merger. As of March 31, 2019, GTx had 13 full-time employees. If the merger is not completed and GTx is able to raise sufficient additional funds necessary to pursue the continued development of its SARD program, GTx will need to hire experienced personnel to continue to develop its SARD program and to develop and commercialize any potential future product candidates, and GTx will need to expand the number of its managerial, operational, financial and other employees to support that growth.

Q: Whyare the two companies proposing to merge?

A: Oncternal and GTx believe that the merger will result in a clinical-stage biopharmaceutical company focused on developing first-in-class product candidates for cancers with critical unmet medical need. For a discussion of GTx's and Oncternal's reasons for the merger, please see the section entitled "The Merger—GTx Reasons for the Merger" and "The Merger—Oncternal Reasons for the Merger" in this proxy statement/prospectus/information statement.

Q: Whyam I receiving this proxy statement/prospectus/information statement?

A: You are receiving this proxy statement/prospectus/information statement because you have been identified as a stockholder of GTx as of the record date, or a stockholder of Oncternal eligible to execute the Oncternal written consent. If you are a stockholder of GTx, you are entitled to vote at GTx's annual stockholder meeting (referred to herein as the "GTx special meeting") to approve Proposal Nos. 1, 2, 3, 4, 5 and 6. If you are a stockholder of Oncternal, you are being requested to sign and return the Oncternal written consent to adopt the Merger Agreement and approve the transactions contemplated thereby, including the merger.

This document serves as:

- a proxy statement of GTx used to solicit proxies for the GTx special meeting;
- a prospectus of GTx used to offer shares of GTx's common stock in exchange for shares of Oncternal's capital stock in the merger and issuable upon exercise of Oncternal's warrants and options, as applicable; and
- an information statement of Oncternal used to solicit the written consent of its stockholders for the adoption of the Merger Agreement and the approval of the merger and related transactions.

Q: Whatis required to consummate the merger?

A: To consummate the merger, GTx's stockholders must approve Proposal Nos. 1 and 2.

Proposal No. 1, the approval of the merger and the issuance of GTx's common stock pursuant to the Merger Agreement by GTx's stockholders and the change of control resulting from the merger, requires the

affirmative vote of the holders of a majority of the shares of GTx's outstanding common stock entitled to vote and present in person or represented by proxy at the GTx special meeting. Proposal Nos. 2 and 3, the approval of the amendments to the restated certificate of incorporation of GTx to effect the GTx Reverse Stock Split and the GTx Name Change, each requires the affirmative vote of the holders of a majority of the shares of GTx's common stock having voting power outstanding on the record date for the GTx special meeting. Each of Proposal Nos. 1 and 2 are conditioned upon each other. Therefore, the merger cannot be consummated without the approval of Proposal Nos. 1 and 2. Proposal Nos. 3 and 4 are conditioned upon the consummation of the merger. If the merger is not completed or the stockholders do not approve Proposal No. 3, GTx will not change its name to "Oncternal Therapeutics, Inc." If the merger is not completed or the stockholders do not approve Proposal No. 4, the GTx, Inc. 2019 Incentive Award Plan will not become effective. Proposal Nos. 1 and 2 are not conditioned on Proposal No. 3 or Proposal No. 4 being approved.

The (i) adoption and approval of the Merger Agreement and the transactions contemplated thereby, and (ii) the conversion of Oncternal's outstanding preferred stock into Oncternal's common stock immediately prior to the Effective Time, requires the written consent of the following, in each case, outstanding as of the record date for the written consent:

- the holders of a majority of the shares of Oncternal's common stock and Oncternal's preferred stock, voting as a single class;
- the holders of at least 60% of the shares of Oncternal's preferred stock, voting together as a single class;
- the holders of at least a majority of the outstanding shares of Oncternal's Series A preferred stock, voting as a single class;
- the holders of at least a majority of the outstanding shares of Oncternal's Series B preferred stock and Oncternal's Series B-2 preferred stock, voting together as a single class; and
- the holders of at least 70% of the shares of Oncternal's Series C preferred stock, voting as a single class.

Certain of Oncternal's stockholders who in the aggregate own approximately 44% of the outstanding shares of Oncternal's capital stock on an as converted to common stock basis, and certain of GTx's stockholders who in the aggregate own approximately 45% of the outstanding shares of GTx's common stock, are parties to voting agreements with GTx and Oncternal, whereby such stockholders have agreed, subject to the terms of the voting agreements, to vote their shares in favor of the adoption or approval, among other things, of the Merger Agreement and the transactions contemplated therein, including the merger and the issuance of GTx's common stock to Oncternal's stockholders pursuant to the Merger Agreement. In addition, following the registration statement on Form S-4, of which this proxy statement/prospectus/information statement is a part, being declared effective by the SEC and pursuant to the conditions of the Merger Agreement, Oncternal's stockholders who are party to the voting agreements will each execute written consents approving the merger and related transactions. Stockholders of Oncternal, including those who are parties to voting agreements, are being requested to execute written consents providing such approvals. Oncternal's largest stockholder prior to the merger, Shanghai Pharmaceutical (USA) Inc. ("SPH USA"), which holds 100% of the outstanding Series C preferred stock and which represents approximately 20.9% of the outstanding shares of Oncternal capital stock on as converted common stock basis, has not executed a voting agreement. Although Oncternal expects to receive stockholder approval from SPH USA approximately two months after the date of the Merger Agreement, there can be no assurance that all of the necessary stockholder approvals will be obtained.

In addition to the requirement of obtaining the stockholder approvals described above and appropriate regulatory approvals, each of the other closing conditions set forth in the Merger Agreement must be satisfied or waived. For a more complete description of the closing conditions under the Merger Agreement, we urge you to read the section entitled "The Merger Agreement—Conditions to the Completion of the Merger" in this proxy statement/prospectus/information statement.

Q: Whatwill Oncternal's stockholders, warrant holders and option holders receive in the merger?

A: As a result of the merger, assuming an estimated exchange ratio of 0.4474, Oncternal's stockholders will become entitled to receive shares of GTx's common stock equal to, in the aggregate, approximately 75% of the outstanding capital stock of GTx. The ownership percentage to be held by GTx's stockholders is subject to adjustment prior to closing of the merger, including a downward adjustment to the extent that GTx's "Parent Cash Amount" (as defined in the Merger Agreement) at the Effective Time is less than the threshold provided in the Merger Agreement, which adjusts based on the date of closing (and as a result, GTx stockholders could own less, and Oncternal stockholders could own more, of the combined organization), an upward adjustment to the extent that GTx's Parent Cash Amount at the Effective Time is greater than the threshold provided in the Merger Agreement, which adjusts based on the date of closing (and as a result, GTx stockholders could own more, and Oncternal stockholders could own less, of the combined organization), or an upward adjustment to the extent that Oncternal's "Company Cash Amount" (as defined in the Merger Agreement) at the Effective Time is less than $10,500,000 (and as a result, GTx stockholders could own more, and Oncternal stockholders could own less, of the combined organization).

GTx will assume outstanding and unexercised warrants and options to purchase shares of Oncternal capital stock, and in connection with the merger they will be converted into warrants and options, as applicable, to purchase shares of GTx's common stock, with the number of GTx shares subject to such warrant or option, and the exercise price, being appropriately adjusted to reflect the exchange ratio between GTx's common stock and Oncternal capital stock determined in accordance with the Merger Agreement.

For a more complete description of what Oncternal's stockholders, warrant holders and option holders will receive in the merger, please see the sections entitled and "The Merger Agreement—Merger Consideration" in this proxy statement/prospectus/information statement.

Q: Whatwill GTx's stockholders, warrant holders and option holders receive in the merger?

A: At the Effective Time, GTx's stockholders will continue to own and hold their existing shares of GTx's common stock, and all outstanding and unexercised options to purchase shares of GTx's common stock and outstanding and unexercised warrants to purchase shares of GTx's common stock will remain in effect pursuant to their terms, except that the vesting of such options will be accelerated in full effective as of immediately prior to the Effective Time.

In addition, GTx stockholders as of immediately prior to the Effective Time will receive one contingent value right ("CVR") for each share of GTx common stock held of record as of immediately prior to the Effective Time. Each CVR will represent the right to receive payments based on GTx's SARD or SARM technology. In particular, CVR holders will be entitled to 50% of the aggregate amount of any net proceeds received by the combined company during the 15-year period after the closing of the merger from the grant, sale or transfer of rights to GTx's SARD or SARM technology that occurs during the 10-year period after the closing (or in the 11th year if based on a term sheet approved during the initial 10-year period) and, if applicable, to receive royalties on the sale of any SARD or SARM products by the combined company during the 15-year period after the closing. The CVRs will be issued pursuant to a Contingent Value Rights Agreement (the "CVR Agreement") and Marc Hanover will act as representative of holders of the CVRs. In light of the results of the ASTRID trial, Oncternal has no current intent to develop the SARM program.

Q: Whowill be the directors of GTx following the merger?

A: In connection with the merger, the GTx Board will be expanded to include a total of nine directors. Pursuant to the terms of the Merger Agreement, two of such directors will be designated by GTx and two of such directors will be designated by SPH USA, Oncternal's largest stockholder prior to the merger. Four of the remaining five directors are expected to be current directors of Oncternal, including one such director who will be the Chairman of the combined organization and one such director who will be the Chief Executive

Officer of the combined organization. It is anticipated that, following the closing of the merger, the GTx Board will be constituted as follows:

Name	Age	Current Principal Affiliation
David F. Hale	70	Oncternal Therapeutics, Inc., Chairman
James B. Breitmeyer, M.D., Ph.D.	65	Oncternal Therapeutics, Inc., President, Chief Executive Officer and Director
Michael G. Carter, M.D., Ch.B., F.R.C.P.	81	GTx, Inc., Director
Daniel L. Kisner, M.D.	71	Oncternal Therapeutics, Inc., Director Nominee
William R. LaRue	68	Oncternal Therapeutics, Inc., Director
Yanjun Liu, Ph.D.	54	Oncternal Therapeutics, Inc., Director
Xin Nakanishi, Ph.D.	56	Oncternal Therapeutics, Inc., Director
Charles P. Theuer, M.D., Ph.D.	55	Oncternal Therapeutics, Inc., Director
Robert J. Wills, Ph.D.	65	GTx, Inc., Executive Chairman

Q: Whowill be the executive officers of GTx immediately following the merger?

A: Immediately following the consummation of the merger, the executive management team of GTx is expected to be composed solely of the members of the Oncternal executive management team prior to the merger:

Name	Title
James B. Breitmeyer, M.D. Ph.D.	President and Chief Executive Officer
Richard G. Vincent	Chief Financial Officer
Hazel M. Aker	General Counsel

Q: Asa stockholder of GTx, how does the GTx Board recommend that I vote?

A: After careful consideration, the GTx Board recommends that GTx's stockholders vote:

- "FOR" Proposal No. 1 to approve the Merger Agreement and the transactions contemplated thereby, including the merger, the issuance of shares of GTx's common stock to Oncternal's stockholders in the merger and the change of control resulting from the merger;
- "FOR" Proposal No. 2 to approve an amendment to the restated certificate of incorporation of GTx to effect the GTx Reverse Stock Split;
- "FOR" Proposal No. 3 to approve an amendment to the restated certificate of incorporation of GTx to effect the GTx Name Change;
- "FOR" Proposal No. 4 to approve the adoption of the GTx, Inc., 2019 Incentive Award Plan;
- "FOR" Proposal No. 5 to approve, on a nonbinding, advisory basis, the compensation that will be paid or may become payable to GTx's named executive officers in connection with the merger; and
- "FOR" Proposal No. 6 to adjourn the special meeting, if necessary, if a quorum is present, to solicit additional proxies if there are not sufficient votes in favor of Proposal Nos. 1 or 2.

Q: Asa stockholder of Oncternal, how does the Oncternal Board recommend that I vote?

A: After careful consideration, the Oncternal Board recommends that Oncternal's stockholders execute the written consent indicating their vote in favor of the adoption of the Merger Agreement and the approval of the merger and the transactions contemplated by the Merger Agreement.

Q: What risks should I consider in deciding whether to vote in favor of the merger or to execute and return the written consent, as applicable?

A: You should carefully review the section of this proxy statement/prospectus/information statement entitled "Risk Factors," which sets forth certain risks and uncertainties related to the merger, risks and uncertainties to which the combined company's business will be subject, and risks and uncertainties to which each of GTx and Oncternal, as an independent company, is subject.

Q: Whendo you expect the merger to be consummated?

A: We anticipate that the merger will occur during the second quarter of 2019, soon after the GTx special meeting to be held on , 2019 but we cannot predict the exact timing. For more information, please see the section entitled "The Merger Agreement—Conditions to the Completion of the Merger" in this proxy statement/prospectus/information statement.

Q: What are the material U.S. federal income tax consequences of the merger to U.S. Holders of Oncternal shares?

A: It is a condition to GTx's obligation to consummate the merger that GTx receive an opinion from Cooley LLP, dated as of the closing date, to the effect that the merger will qualify as a "reorganization" within the meaning of Section 368(a) of the Internal Revenue Code of 1986, as amended (the "Code"). It is a condition to Oncternal's obligation to consummate the merger that Oncternal receive an opinion from Latham & Watkins LLP, dated as of the closing date, to the effect that the merger will qualify as a "reorganization" within the meaning of Section 368(a) of the Code. Subject to the tax opinion representations and assumptions (as defined on page 162), in the opinions of Cooley LLP and Latham & Watkins LLP, the merger will qualify as a "reorganization" within the meaning of Section 368(a) of the Code. Accordingly, a U.S. Holder (as defined on page 161) of Oncternal's common stock will not recognize any gain or loss for U.S. federal income tax purposes on the exchange of shares of Oncternal common stock for shares of GTx common stock in the merger, except with respect to cash received by a U.S. Holder of Oncternal common stock in lieu of a fractional share of GTx common stock. If any of the tax opinion representations and assumptions is incorrect, incomplete or inaccurate or is violated, the accuracy of the opinions described above may be affected and the U.S. federal income tax consequences of the merger could differ from those described in this proxy statement/prospectus/information statement.

Please review the information in the section entitled "The Merger—Material U.S. Federal Income Tax Consequences of the Merger" for a more complete description of the material U.S. federal income tax consequences of the merger to U.S. Holders of Oncternal common stock. The tax consequences to you of the merger will depend on your particular facts and circumstances. Please consult your tax advisors as to the specific tax consequences to you of the merger.

Q: What are the material U.S. federal income tax consequences of the receipt of CVRs and the GTx Reverse Stock Split to GTx U.S. Holders?

A: GTx intends to report the issuance of the CVRs, to be received by GTx stockholders pursuant to the Merger Agreement, to GTx U.S. Holders (as defined on page 184) as a distribution of property with respect to its stock. Please review the information in the section entitled "Agreements Related to the Merger—CVR Agreement—Material U.S. Federal Income Tax Consequences of the Receipt of CVRs" for a more complete description of the material U.S. federal income tax consequences of the receipt of CVRs to GTx U.S. Holders, including possible alternative treatments. A GTx U.S. Holder generally should not recognize gain or loss upon the GTx Reverse Stock Split, except to the extent a GTx U.S. Holder receives cash in lieu of a fractional share of GTx common stock. Please review the information in the section entitled "Proposal No. 2: Approval of the GTx Reverse Stock Split—Material U.S. Federal Income Tax Consequences of the GTx Reverse Stock Split" for a more complete description of the material U.S. federal income tax consequences of the GTx Reverse Stock Split to GTx U.S. Holders.

The tax consequences to you of the receipt of CVRs and the GTx Reverse Stock Split will depend on your particular facts and circumstances. Please consult your tax advisors as to the specific tax consequences to you.

Q: What do I need to do now?

A: GTx and Oncternal urge you to read this proxy statement/prospectus/information statement carefully, including its annexes, and to consider how the merger affects you.

If you are a stockholder of GTx, you may provide your proxy instructions in one of four different ways. First, you can mail your signed proxy card in the enclosed return envelope. Second, you may provide your proxy instructions via phone by following the instructions on your proxy card or voting instruction form. Third, you may provide your proxy instructions via the Internet by following the instructions on your proxy card or voting instruction form. Finally, you may vote in person at the GTx special meeting, as described below. Please provide your proxy instructions only once, unless you are revoking a previously delivered proxy instruction, and as soon as possible so that your shares can be voted at the GTx special meeting.

If you are a stockholder of Oncternal, you may execute and return your written consent to Oncternal in accordance with the instructions provided by Oncternal.

Q: Whathappens if I do not return a proxy card or otherwise provide proxy instructions, as applicable?

A: If you are a stockholder of GTx, the failure to return your proxy card or otherwise provide proxy instructions (a) will reduce the aggregate number of votes required to approve Proposal Nos. 1, 4, 5 and 6, (b) will have the same effect as voting against Proposal Nos. 2 and 3 and (c) your shares will not be counted for purposes of determining whether a quorum is present at the GTx special meeting.

Q: MayI vote in person at the special meeting of stockholders of GTx?

A: If your shares of GTx's common stock are registered directly in your name with GTx's transfer agent, you are considered to be the stockholder of record with respect to those shares, and the proxy materials and proxy card are being sent directly to you by GTx. If you are a stockholder of GTx of record, you may attend the GTx special meeting and vote your shares in person. Even if you plan to attend the GTx special meeting in person, GTx requests that you sign and return the enclosed proxy to ensure that your shares will be represented at the GTx special meeting if you become unable to attend. If your shares of GTx's common stock are held in a brokerage account or by another nominee, you are considered the beneficial owner of shares held in "street name," and the proxy materials are being forwarded to you by your broker or other nominee together with a voting instruction card. As the beneficial owner, you are also invited to attend the GTx special meeting. Because a beneficial owner is not the stockholder of record, you may not vote these shares in person at the GTx special meeting unless you obtain a proxy from the broker, trustee or nominee that holds your shares, giving you the right to vote the shares at the GTx special meeting.

Q: Whenand where is the special meeting of GTx's stockholders?

A: The GTx special meeting will be held at a.m., Central time, on , 2019 at 17 W Pontotoc Ave., Suite 100, Memphis, Tennessee 38103, unless postponed or adjourned to a later date. Subject to space availability, all of GTx's stockholders as of the record date, or their duly appointed proxies, may attend the GTx special meeting.

Q: Ifmy GTx shares are held in "street name" by my broker, will my broker vote my shares for me?

A: Unless your broker has discretionary authority to vote on certain matters, your broker will not be able to vote your shares of GTx's common stock without instructions from you. Brokers are not expected to have

discretionary authority to vote for any of the Proposals. To make sure that your vote is counted, you should instruct your broker to vote your shares, following the procedures provided by your broker.

Q: MayI change my vote after I have submitted a proxy or provided proxy instructions?

A: GTx's stockholders of record, other than those of GTx's stockholders who are parties to voting agreements, may change their vote at any time before their proxy is voted at the GTx special meeting in one of three ways. First, a stockholder of record of GTx can send a written notice to the Secretary of GTx stating that it would like to revoke its proxy. Second, a stockholder of record of GTx can submit new proxy instructions either on a new proxy card or via the Internet. Third, a stockholder of record of GTx can attend the GTx special meeting and vote in person. Attendance alone will not revoke a proxy. If a stockholder of GTx of record or a stockholder who owns GTx shares in "street name" has instructed a broker to vote its shares of GTx's common stock, the stockholder must follow directions received from its broker to change those instructions.

Q: Whois paying for this proxy solicitation?

A: GTx and Oncternal will share equally the cost of printing and filing of this proxy statement/prospectus/information statement and the proxy card. Arrangements will also be made with brokerage firms and other custodians, nominees and fiduciaries who are record holders of GTx's common stock for the forwarding of solicitation materials to the beneficial owners of GTx's common stock. GTx will reimburse these brokers, custodians, nominees and fiduciaries for the reasonable out-of-pocket expenses they incur in connection with the forwarding of solicitation materials.

Q: Whocan help answer my questions?

A: If you are a stockholder of GTx and would like additional copies, without charge, of this proxy statement/prospectus/information statement or if you have questions about the merger, including the procedures for voting your shares, you should contact:

GTx, Inc.
17 W Pontotoc Ave., Suite 100
Memphis, TN 38103
Tel: (901) 523-9700
Attn: Henry Doggrell

If you are a stockholder of Oncternal, and would like additional copies, without charge, of this proxy statement/prospectus/information statement or if you have questions about the merger, including the procedures for voting your shares, you should contact:

Oncternal Therapeutics, Inc.
11750 Sorrento Valley Road, Suite 250
San Diego, CA 92121
Tel: (858) 434-1113
Attn: Richard G. Vincent
Email: info@oncternal.com

PROSPECTUS SUMMARY

This summary highlights selected information from this proxy statement/prospectus/information statement and may not contain all of the information that is important to you. To better understand the merger, the proposals being considered at the GTx special meeting and Oncternal's stockholder actions that are the subject of the written consent, you should read this entire proxy statement/prospectus/information statement carefully, including the Merger Agreement attached as Annex A, the opinion of Aquilo Partners, L.P. attached as Annex B and the other annexes to which you are referred herein. For more information, please see the section entitled "Where You Can Find More Information" in this proxy statement/prospectus/information statement.

The Companies

GTx, Inc.
17 W Pontotoc Ave., Suite 100
Memphis, Tennessee 38103
(901) 523-9700
Attn: Marc S. Hanover

GTx is a biopharmaceutical company dedicated to the discovery, development and commercialization of medicines to treat serious and/or significant unmet medical conditions. Under an exclusive worldwide license agreement with the University of Tennessee Research Foundation ("UTRF"), GTx is developing UTRF's proprietary selective androgen receptor degrader, or SARD, technology, which GTx believes has the potential to provide compounds that can degrade or antagonize multiple forms of androgen receptor thereby potentially inhibiting tumor growth in patients with progressive castration-resistant prostate cancer, including those patients who do not respond to or are resistant to current androgen targeted therapies. GTx is in the process of completing ongoing mechanistic preclinical studies in order to select the most appropriate SARD compounds to move forward into the additional preclinical studies required to submit an investigational new drug application ("IND"), and potentially advance one of its SARD compounds into a first-in-human clinical trial.

Oncternal Therapeutics, Inc.

11750 Sorrento Valley Road, Suite 250
San Diego, CA 92121
Tel: (858) 434-1113
Attn: James B. Breitmeyer, M.D., Ph.D.

Oncternal is a clinical-stage biopharmaceutical company focused on developing potential first-in-class therapies for cancers in which there is critical unmet medical need. The company's drug development efforts are focused on promising, yet untreated biological pathways implicated in cancer genesis and progression. Oncternal's pipeline includes several key programs.

- ***Cirmtuzumab***, Oncternal's lead product candidate, is an investigational, potentially first-in-class humanized monoclonal antibody that is designed to bind with high affinity to Receptor-tyrosine kinase-like Orphan Receptor 1 ("ROR1"), a protein that is selectively expressed in many forms of cancer including hematological malignancies as well as many solid tumors. Cirmtuzumab is being developed in collaboration with the University of California San Diego ("UC San Diego") and in collaboration and with funding support from the California Institute for Regenerative Medicine, ("CIRM"). Early preclinical and clinical results suggest that ROR1 is a target with broad potential in oncology. Cirmtuzumab is being studied in a Phase 1/2 clinical trial in combination with ibrutinib in patients with chronic lymphocytic leukemia ("CLL") and mantle cell lymphoma ("MCL"), and in combination with paclitaxel for the treatment of women with metastatic breast cancer.

- ***TK216*** is an investigational, potentially first-in-class small molecule that is designed to inhibit the biological activity of E26 transformation-specific ("ETS"), transcription factor oncoproteins including fusion proteins. TK216 is being evaluated alone and in combination with vincristine in a Phase 1 clinical trial in patients with relapsed or refractory Ewing sarcoma, a rare pediatric cancer that has historically been very challenging to treat effectively.
- ***ROR1 CAR-T***—Oncternal is also developing a CAR-T program targeting ROR1 in collaboration with UC San Diego, who has received funding support directly from CIRM. This program is currently in preclinical development as a potential treatment for both hematologic malignancies and solid tumors.

Grizzly Merger Sub, Inc.

Merger Sub is a wholly-owned subsidiary of GTx, and was formed solely for the purposes of carrying out the merger.

The Merger (see page 120)

If the merger is completed, Merger Sub will merge with and into Oncternal, with Oncternal surviving as a wholly-owned subsidiary of GTx.

Prior to the Effective Time, each share of Oncternal preferred stock will be converted into one share of Oncternal common stock. At the Effective Time, each share of Oncternal common stock outstanding immediately prior to the Effective Time (excluding certain shares to be canceled pursuant to the Merger Agreement, and shares held by stockholders who have exercised and perfected appraisal rights as more fully described in the section entitled "The Merger—Appraisal Rights" below) will be converted into the right to receive approximately 0.4474 shares of GTx's common stock, subject to adjustment for the GTx Reverse Stock Split. This exchange ratio is an estimate only and the final exchange ratio will be determined pursuant to a formula described in more detail in the Merger Agreement and in this proxy statement/prospectus/information statement. Immediately after the merger, assuming an exchange ratio of 0.4474, Oncternal's stockholders as of immediately prior to the Effective Time will own approximately 75% of the outstanding capital stock of GTx, and GTx's stockholders as of immediately prior to the Effective Time will own approximately 25% of the outstanding capital stock of GTx. The ownership percentage to be held by GTx's stockholders is subject to adjustment prior to closing of the merger, including a downward adjustment to the extent that GTx's "Parent Cash Amount" (as defined in the Merger Agreement) at the Effective Time is less than the threshold provided in the Merger Agreement, which adjusts based on the date of closing (and as a result, GTx stockholders could own less, and Oncternal stockholders could own more, of the combined company), an upward adjustment to the extent that GTx's Parent Cash Amount at the Effective Time is greater than the threshold provided in the Merger Agreement, which adjusts based on the date of closing (and as a result, GTx stockholders could own more, and Oncternal stockholders could own less, of the combined company), or an upward adjustment to the extent that Oncternal's "Company Cash Amount" (as defined in the Merger Agreement) at the Effective Time is less than $10,500,000 (and as a result, GTx stockholders could own more, and Oncternal stockholders could own less, of the combined company). The exchange ratio formula excludes Oncternal's outstanding stock options and warrants and GTx's outstanding stock options and warrants. GTx will assume outstanding and unexercised options and warrants to purchase Oncternal capital stock, and each such option or warrant will be converted into options or warrants, as applicable, to purchase GTx's common stock.

For a more complete description of the merger exchange ratio please see the section entitled "The Merger Agreement" in this proxy statement/prospectus/information statement.

The closing of the merger will occur no later than the second business day after the last of the conditions to the merger has been satisfied or waived (other than those conditions that by their nature are to be satisfied at the closing, but subject to the satisfaction or waiver of each such conditions), or at such other time as GTx and Oncternal agree. GTx and Oncternal anticipate that the consummation of the merger will occur in the second

quarter of the fiscal year. However, because the merger is subject to a number of conditions, neither GTx nor Oncternal can predict exactly when the closing will occur or if it will occur at all. After completion of the merger, assuming that GTx receives the required stockholder approval of Proposal No. 3, GTx will be renamed "Oncternal Therapeutics, Inc."

Reasons for the Merger (see page 133)

The merger will produce a clinical-stage biopharmaceutical company focused on developing first-in-class product candidates for cancers with critical unmet medical need. GTx and Oncternal believe that the combined company will have the following characteristics found in successful biotech companies:

- *Diverse Clinical Stage Pipeline*. The combined company will focus on developing potentially first-in-class product candidates for cancers with critical unmet medical need and will have two clinical stage product candidates, cirmtuzumab and TK216, in clinical trials for CLL, MCL and Ewing sarcoma. Additional indications are under consideration for future clinical trials.
- *Novel Preclinical Programs*: The combined company will develop a CAR-T program targeting ROR1 as a potential treatment for both hematologic malignancies and solid tumors, and a selective androgen receptor degrader, or SARD, as a potential treatment for patients with castration-resistant prostate cancer.
- *Management Team*. The combined company will be led by the experienced senior management from Oncternal and a board of directors with representation from each of Oncternal and GTx.
- *Cash Resources*. The combined company is expected to have approximately $26.0 million in cash and cash equivalents at the closing of the merger, which GTx and Oncternal believe is sufficient to enable Oncternal to implement its near-term business plans.

Each of GTx's and Oncternal's respective board of directors also considered other reasons for the merger, as described herein. For example, the GTx Board considered, among other things:

- the strategic alternatives of GTx to the merger, including the discussions that GTx senior management and the GTx Board previously conducted with other potential merger partners;
- the failure to demonstrate the effectiveness of enobosarm as a potential treatment for stress urinary incontinence ("SUI"), and the unlikelihood that such circumstances would change for the benefit of GTx's stockholders in the foreseeable future;
- the risks of developing a product candidate out of the SARD program, including the costs of contracting with third parties to complete the necessary preclinical development work to select a lead compound, submitting an IND, and developing a product candidate through further preclinical studies and potentially clinical trials;
- the risk associated with, and uncertain value and costs to stockholders of, winding down operations of GTx;
- the risks of continuing to operate GTx on a stand-alone basis, including developing its SARD program and the need to raise additional funding and expend significant resources to advance this portfolio and to rebuild its infrastructure and management to continue its operations; and
- the opportunity as a result of the merger for GTx's stockholders to participate in the potential value of the Oncternal product candidate portfolio as well as the potential value derived from the sale or licensing of its SARD or SARM programs pursuant to the CVR agreement.

In addition, the Oncternal Board approved the merger based on a number of factors, including the:

- potential increased access to sources of capital and a broader range of investors to support the clinical development of its products than it could otherwise obtain if it continued to operate as a privately held company;
- potential to provide its current stockholders with greater liquidity by owning stock in a public company;
- Oncternal Board's belief that no alternatives to the merger were reasonably likely to create greater value for Oncternal's stockholders, or enable accelerated investment in Oncternal's portfolio, after reviewing the various strategic options to enhance stockholder value that were considered by the Oncternal Board;
- cash resources of the combined organization expected to be available at the closing of the merger; and
- expectation that the merger will be treated as a reorganization for U.S. federal income tax purposes.

Opinion of the GTx Financial Advisor (see page 138)

The GTx Board engaged Aquilo Partners, L.P. ("Aquilo") to provide financial advisory services and to consider and evaluate potential strategic transactions on its behalf. GTx ultimately requested that Aquilo deliver a fairness opinion with respect to the merger with Oncternal. On March 6, 2019, Aquilo delivered its oral opinion, subsequently confirmed in writing, to the GTx Board to the effect that, as of the date of its opinion and based upon and subject to the qualifications, limitations and assumptions set forth therein, the consideration is fair, from a financial point of view, to GTx's stockholders.

The full text of Aquilo's written opinion, which sets forth the procedures followed, assumptions made, matters considered, and limitations and qualifications of the review undertaken in connection with the opinion, is attached as *Annex B*. You are urged to, and should, read the written opinion of Aquilo carefully and in its entirety. Aquilo's opinion was intended for the use and benefit of the GTx Board (in its capacity as such) in connection with its evaluation of the merger. Aquilo's opinion was not intended to be used for any other purpose without Aquilo's prior written consent in each instance, except as GTx's counsel advises is required by law. Aquilo has consented to the inclusion of Aquilo's opinion in this proxy statement. Aquilo's opinion does not address GTx's underlying business decision to enter into the Merger Agreement or CVR Agreement, the relative merits of the merger compared to any alternative transactions or strategies that were or may be available to GTx. Aquilo's opinion did not constitute a recommendation to the GTx Board as to how to act or to any GTx stockholder or any other person as to how to vote with respect to the merger with Oncternal or any other matter.

For a more complete description, see the section of this proxy statement captioned "The Merger—Opinion of the GTx Financial Advisor."

Material U.S. Federal Income Tax Consequences of the Merger (see page 160)

It is a condition to GTx's obligation to consummate the merger that GTx receive an opinion from Cooley LLP, dated as of the closing date, to the effect that the merger will qualify as a "reorganization" within the meaning of Section 368(a) of the Code. It is a condition to Oncternal's obligation to consummate the merger that Oncternal receive an opinion from Latham & Watkins LLP, dated as of the closing date, to the effect that the merger will qualify as a "reorganization" within the meaning of Section 368(a) of the Code. Subject to the tax opinion representations and assumptions (as defined on page 162), in the opinions of Cooley LLP and Latham & Watkins LLP, the merger will qualify as a "reorganization" within the meaning of Section 368(a) of the Code. Accordingly, a U.S. Holder (as defined on page 161) of Oncternal common stock will not recognize any gain or loss for U.S. federal income tax purposes on the exchange of shares of Oncternal common stock for shares of

GTx common stock in the merger, except with respect to cash received by a U.S. Holder of Oncternal common stock in lieu of a fractional share of GTx common stock. If any of the tax opinion representations and assumptions is incorrect, incomplete or inaccurate or is violated, the accuracy of the opinions described above may be affected and the U.S. federal income tax consequences of the merger could differ from those described in this proxy statement/prospectus/information statement.

Please review the information in the section entitled "The Merger—Material U.S. Federal Income Tax Consequences of the Merger" for a more complete description of the material U.S. federal income tax consequences of the merger to U.S. Holders of Oncternal common stock. The tax consequences to you of the merger will depend on your particular facts and circumstances. Please consult your tax advisors as to the specific tax consequences to you of the merger.

Material U.S. Federal Income Tax Consequences of the Receipt of CVRs and the GTx Reverse Stock Split (see pages 183 and 193)

GTx intends to report the issuance of CVRs to GTx U.S. Holders (as defined on page 184) as a distribution of property with respect to its stock. Please review the information in the section entitled "Agreements Related to the Merger—CVR Agreement—Material U.S. Federal Income Tax Consequences of the Receipt of CVRs" for a more complete description of the material U.S. federal income tax consequences of the receipt of CVRs to GTx U.S. Holders, including possible alternative treatments.

A GTx U.S. Holder generally should not recognize gain or loss upon the GTx Reverse Stock Split, except to the extent a GTx U.S. Holder receives cash in lieu of a fractional share of GTx common stock. Please review the information in the section entitled "Proposal No. 2: Approval of the GTx Reverse Stock Split—Material U.S. Federal Income Tax Consequences of the GTx Reverse Stock Split" for a more complete description of the material U.S. federal income tax consequences of the GTx Reverse Stock Split to GTx U.S. Holders.

The tax consequences to you of the receipt of CVRs and the GTx Reverse Stock Split will depend on your particular facts and circumstances. Please consult your tax advisors as to the specific tax consequences to you.

Overview of the Merger Agreement

Merger Consideration (see page 158)

Prior to the Effective Time, each share of outstanding Oncternal preferred stock will be converted into one share of Oncternal common stock. At the Effective Time, each share of Oncternal's common stock outstanding immediately prior to the Effective Time (excluding shares of Oncternal's common stock held as treasury stock or held by Oncternal, Merger Sub or any subsidiary of Oncternal) will automatically be converted into the right to receive a number of shares of GTx's common stock equal to approximately 0.4474. This exchange ratio is an estimate only and the final exchange ratio will be determined pursuant to a formula described in more detail in the Merger Agreement and in this proxy statement/prospectus/information statement.

Immediately after the merger, assuming an exchange ratio of 0.4474, Oncternal's stockholders as of immediately prior to the Effective Time will own approximately 75% of the outstanding capital stock of GTx and GTx stockholders as of immediately prior to the Effective Time will own approximately 25% of the outstanding capital stock of GTx. The ownership percentage to be held by GTx's stockholders is subject to adjustment prior to closing of the merger, including a downward adjustment to the extent that GTx's "Parent Cash Amount" (as defined in the Merger Agreement) at the Effective Time is less than the threshold provided in the Merger Agreement, which adjusts based on the date of closing (and as a result, GTx stockholders could own less, and Oncternal stockholders could own more, of the combined organization), an upward adjustment to the extent that GTx's Parent Cash Amount at the Effective Time is greater than the threshold provided in the Merger Agreement, which adjusts based on the date of closing

(and as a result, GTx stockholders could own more, and Oncternal stockholders could own less, of the combined organization), or an upward adjustment to the extent that Oncternal's "Company Cash Amount" (as defined in the Merger Agreement) at the Effective Time is less than $10,500,000 (and as a result, GTx stockholders could own more, and Oncternal stockholders could own less, of the combined organization). The exchange ratio formula excludes Oncternal's outstanding stock options and warrants and GTx's outstanding stock options and warrants.

The Merger Agreement does not include a price-based termination right, and there will be no adjustment to the total number of shares of GTx's common stock that Oncternal's stockholders will be entitled to receive for changes in the market price of GTx's common stock after the date the Merger Agreement was signed. Accordingly, the market value of the shares of GTx's common stock issued pursuant to the merger will depend on the market value of the shares of GTx's common stock at the time the merger closes, and could vary significantly from the market value on the date of this proxy statement/prospectus/information statement.

Treatment of GTx's Stock Awards and Warrants (see page 169)

Prior to the closing of the merger, the GTx Board will adopt appropriate resolutions and take all other actions necessary and appropriate to provide that the vesting of each unexpired and unexercised option to purchase GTx's common stock will be accelerated in full effective as of immediately prior to the Effective Time. The number of shares of common stock underlying each option and warrant and the exercise price for such options and warrants will be adjusted to account for the GTx Reverse Stock Split. The terms governing options and warrants to purchase GTx's common stock will otherwise remain in full force and effect following the closing of the merger.

Under the Merger Agreement, as of immediately prior to the closing of the merger (but in no event more than 30 days prior to the Effective Time), GTx shall take all actions necessary to cause the termination and liquidation of the GTx 2018 Amended and Restated Directors' Deferred Compensation Plan (the "GTx Director Deferred Compensation Plan"), and all deferred stock rights thereunder, effective immediately prior to the closing of the merger, subject to the consummation of the merger (the "GTx Deferred Stock Rights"). GTx shall also ensure that any deferrals under the GTx Director Deferred Compensation Plan on or after January 3, 2019, shall be settled only in cash and that the maximum number of shares of common stock of GTx issuable upon settlement of the GTx Deferred Stock Rights shall be limited to the number of GTx Deferred Stock Rights outstanding as of the date of the Merger Agreement.

Treatment of Oncternal's Stock Awards and Warrants (see page 170)

Pursuant to the Merger Agreement, at the Effective Time:

- each option to purchase shares of Oncternal's capital stock that is outstanding and unexercised immediately prior to the Effective Time granted under the Oncternal Therapeutics 2015 Equity Incentive Plan, whether or not vested, will be assumed by GTx and will become an option to purchase that number of shares of GTx's common stock equal to the product obtained by multiplying (i) the number of shares of Oncternal's common stock that were subject to such option immediately prior to the Effective Time by (ii) the exchange ratio, rounded down to the nearest whole share. The per share exercise price for shares of GTx's common stock issuable upon exercise of each Oncternal option assumed by GTx shall be determined by dividing (a) the per share exercise price of Oncternal's common stock subject to such Oncternal option, as in effect immediately prior to the Effective Time, by (b) the exchange ratio, rounded up to the nearest whole cent. Any restriction on the exercise of any Oncternal option assumed by GTx will continue in full force and effect and the term, exercisability, vesting schedule and other provisions of such Oncternal option shall otherwise remain unchanged; and

- each warrant to purchase shares of Oncternal capital stock outstanding and unexercised immediately prior to the Effective Time will be assumed by GTx and will become a warrant to purchase that number of shares of GTx's common stock equal to the product obtained by multiplying (i) the number of shares of Oncternal's common stock, or the number of shares of Oncternal's common stock issuable upon conversion of the shares of Oncternal's preferred stock issuable upon exercise of the Oncternal warrant, as applicable, that were subject to such warrant immediately prior to the Effective Time by (ii) the exchange ratio, rounded down to the nearest whole share. The per share exercise price for shares of GTx's common stock issuable upon exercise of each Oncternal warrant assumed by GTx shall be determined by dividing (a) the per share exercise price of Oncternal's capital stock subject to such Oncternal warrant, as in effect immediately prior to the Effective Time, by (b) the exchange ratio rounded up to the nearest whole cent. Any restriction on any Oncternal warrant assumed by GTx shall continue in full force and effect and the terms and other provisions of such Oncternal warrant shall otherwise remain unchanged.

In addition, pursuant to the Merger Agreement, at the Effective Time, each restricted share of Oncternal common stock that is outstanding will be converted into a share of GTx on the same basis as other shares of Oncternal common stock. Any restrictions on such restricted shares will continue in full force and effect and the vesting schedule and other provisions of such Oncternal restricted shares shall otherwise remain unchanged.

Conditions to the Completion of the Merger (see page 171)

To consummate the merger, GTx's stockholders must approve Proposal Nos. 1 and 2. Additionally, Oncternal's stockholders must (i) adopt and approve the Merger Agreement and the transactions contemplated thereby, (ii) acknowledge that the approval given is irrevocable and that such stockholders are aware of their rights to demand appraisal for its shares pursuant to Section 262 of the DGCL, and that such stockholders have received and read a copy of Section 262 of the DGCL, which is included as *Annex C* in this proxy statement/prospectus/information statement, (iii) acknowledge that by their approval of the merger the approving stockholders are not entitled to appraisal rights with respect to their shares in connection with the merger and thereby waive any rights to receive payment of the fair value of their capital stock under the DGCL, and (iv) approve the conversion of Oncternal's outstanding preferred stock into Oncternal's common stock immediately prior to the Effective Time.

In addition to obtaining such stockholder approvals and appropriate regulatory approvals, each of the other closing conditions set forth in the Merger Agreement, as described under the section entitled "The Merger Agreement—Conditions to the Completion of the Merger" in this proxy statement/prospectus/information statement must be satisfied or waived.

No Solicitation (see page 175)

Each of GTx and Oncternal agreed that, except as described below, from the date of the Merger Agreement until the earlier of the consummation of the merger or the termination of the Merger Agreement in accordance with its terms, GTx and Oncternal and any of their respective subsidiaries will not, nor will either party or any of its subsidiaries authorize any of the directors, officers, employees, agents, attorneys, accountants, investment bankers, advisors or representatives retained by it or any of its subsidiaries to, directly or indirectly:

- solicit, initiate or knowingly encourage, induce or facilitate the communication, making, submission or announcement of, any "acquisition proposal" (as defined in the section entitled "The Merger Agreement—No Solicitation" below), or "acquisition inquiry" (as defined in the section entitled "The Merger Agreement—No Solicitation" below);
- furnish any non-public information with respect to it to any person in connection with or in response to an acquisition proposal or acquisition inquiry;

- engage in discussions or negotiations with any person with respect to any acquisition proposal or acquisition inquiry;
- approve, endorse or recommend an acquisition proposal;
- execute or enter into any letter of intent or similar document or any contract contemplating or otherwise relating to an acquisition transaction (other than a confidentiality agreement as permitted by the Merger Agreement) (as defined in the section entitled "The Merger Agreement—No Solicitation" below); or
- publicly propose to do any of the above.

Termination of the Merger Agreement (see page 180)

Either GTx or Oncternal can terminate the Merger Agreement under certain circumstances, which would prevent the merger from being consummated.

Termination Fee (see page 182)

If the Merger Agreement is terminated under certain circumstances, GTx or Oncternal will be required to pay the other party a termination fee of up to $2.0 million.

CVR Agreement (see page 183)

At the closing of the merger, GTx, Marc Hanover, as representative of holders of the CVRs, and a rights agent will enter into the CVR Agreement. Pursuant to the CVR Agreement, GTx stockholders will receive one CVR for each share of GTx common stock held as of immediately prior to the Effective Time. Each CVR will represent the right to receive payments based on net proceeds derived from GTx's SARD or SARM technology during the term of the CVR. In particular, CVR holders will be entitled to 50% of the aggregate amount of any net proceeds received by the combined company during the 15-year period after the closing of the merger from the grant, sale or transfer of rights to GTx's SARD or SARM technology that occurs during the 10-year period after the closing (or in the 11th year if based on a term sheet approved during the initial 10-year period) and, if applicable, to receive royalties on the sale of any SARD or SARM products by the combined company during the 15-year period after the closing. In light of the results of the ASTRID trial, Oncternal has no current intent to develop the SARM program.

Voting Agreements and Written Consents (see page 186)

In order to induce GTx to enter into the Merger Agreement, certain stockholders of Oncternal are parties to a voting agreement with Oncternal and GTx pursuant to which, among other things, each stockholder has agreed, solely in its capacity as a stockholder of Oncternal, to vote all of its shares of Oncternal's capital stock in favor of (i) the adoption and approval of the Merger Agreement and the transactions contemplated thereby, (ii) acknowledgement that the approval given for the Merger Agreement is irrevocable and that the stockholder is aware of its appraisal rights under the DGCL, (iii) acknowledgement that the stockholder is not entitled to appraisal rights by voting in favor of the transaction and waiving appraisal rights under the DGCL, and (iv) the conversion of each share of Oncternal preferred stock into Oncternal common stock. Additionally, each stockholder has agreed, solely in its capacity as a stockholder of Oncternal, to vote against any competing acquisition proposal and any action, proposal or transaction that would reasonably be expected to result in a material breach of the voting agreement. These stockholders of Oncternal have also granted an irrevocable proxy to Oncternal and its designee to vote their respective Oncternal's capital stock in accordance with the voting agreements. Oncternal's stockholders may vote their shares of Oncternal capital stock on all other matters not referred to in such proxy.

The Oncternal stockholders who are parties to these voting agreements include all directors, executive officers and certain stockholders, including entities related to MagnaSci Ventures, which represents approximately 10.4% of the outstanding shares of Oncternal capital stock on as converted common stock basis. SPH USA, which holds 100% of the outstanding Series C preferred stock and which represents approximately 20.9% of the outstanding shares of Oncternal capital stock on as converted common stock basis, has not executed a voting agreement. Although Oncternal expects to receive stockholder approval from SPH USA approximately two months after the date of the Merger Agreement, there can be no assurance that all of the necessary stockholder approvals will be obtained.

The Oncternal stockholders who are party to a voting agreement held, as of March 31, 2019:

- an aggregate of 32,059,203 shares of Oncternal's common stock and 38,883,369 shares of Oncternal preferred stock, representing approximately 44% of the outstanding shares of Oncternal capital stock on an as converted to common stock basis;
- an aggregate of 38,883,369 shares of Oncternal's preferred stock, representing approximately 35.0% of the outstanding Oncternal preferred stock, considered as a single class;
- an aggregate of 5,960,000 shares of Oncternal's Series A preferred stock, representing approximately 44.0% of the outstanding Series A preferred stock; and
- an aggregate of 32,923,369 shares of Oncternal's Series B preferred stock and Series B-2 preferred stock, representing approximately 51.9% of the outstanding Series B preferred stock and Series B-2 preferred stock, considered as a single class.

Following the effectiveness of the registration statement of which this proxy statement/prospectus/information statement is a part and pursuant to the Merger Agreement, these stockholders will execute a written consent providing for such adoption and approval.

Under these voting agreements, subject to certain exceptions, such stockholders have also agreed not to sell or transfer shares of Oncternal's capital stock and securities held by them, or any voting rights with respect thereto, until the earlier of the termination of the Merger Agreement or the completion of the merger. To the extent that any such sale or transfer is permitted pursuant to the exceptions included in the voting agreement, each person to which any shares of Oncternal's capital stock or securities are so sold or transferred must agree in writing to be bound by the terms and provisions of the voting agreement, subject to certain further exceptions.

In addition, in order to induce Oncternal to enter into the Merger Agreement, certain of GTx's stockholders have entered into voting agreements with GTx and Oncternal pursuant to which, among other things, each such stockholder has agreed, solely in his, her or its capacity as a stockholder of GTx, to vote all of his, her or its shares of GTx's common stock in favor of Proposal Nos. 1, 2, 3, 4 and 5. Additionally, each such stockholder has agreed, solely in his, her or its capacity as a stockholder of GTx, to vote against any competing acquisition proposal and any action, proposal or transaction that would reasonably be expected to result in a material breach of the voting agreement. These stockholders of GTx have also granted GTx and its designee an irrevocable proxy to vote their respective shares in accordance with the voting agreements. GTx's stockholders may vote their shares of GTx's common stock on all other matters not referred to in such proxy.

The GTx stockholders who are parties to these voting agreements are:

- Robert J. Wills, Ph.D.
- Marc S. Hanover
- J.R. Hyde, III

- Michael G. Carter, M.D., Ch.B., F.R.C.P.
- J. Kenneth Glass
- Garry A. Neil, M.D.
- Kenneth S. Robinson, M.D., M.Div.
- Henry P. Doggrell
- Jason Shackelford
- Pyramid Peak Foundation

As of March 31, 2019, the stockholders of GTx who are party to a voting agreement (including any affiliated entities) owned an aggregate of 10,938,824 shares of GTx's common stock representing approximately 45% of the outstanding shares of GTx's common stock.

Under these voting agreements, subject to certain exceptions, such stockholders also have agreed not to sell or transfer their shares of GTx's common stock and securities held by them until the earlier of the termination of the Merger Agreement or the completion of the merger. To the extent that any such sale or transfer is permitted pursuant to the exceptions included in the voting agreements, each person to whom any shares of GTx's common stock or securities are so sold or transferred must agree in writing to be bound by the terms and provisions of the voting agreement, subject to certain further exceptions.

Lock-up Agreements (see page 188)

As a condition to the closing of the merger, certain stockholders of each of GTx and Oncternal and their affiliates, have entered into lock-up agreements, pursuant to which such parties have agreed not to, except in limited circumstances, offer, pledge, sell, contract to sell, transfer or dispose of, directly or indirectly, engage in swap or similar transactions with respect to, or make any demand for or exercise any right with respect to, any shares of GTx's common stock or any security convertible into or exercisable or exchangeable for GTx's common stock, including, as applicable, shares received in the merger and issuable upon exercise of certain warrants and options, during the period commencing at the Effective Time and continuing until the date that is 180 days from the Effective Time.

Each of the stockholders who is party to a GTx voting agreement is a party to a lock-up agreement. As of March 31, 2019, GTx's stockholders who have executed lock-up agreements owned in the aggregate approximately 45% of the outstanding common stock of GTx.

Each of the stockholders who is party to an Oncternal voting agreement is a party to a lock-up agreement. Oncternal's stockholders who have executed lock-up agreements, as of March 31, 2019, beneficially owned in the aggregate approximately 44% of the outstanding shares of Oncternal's capital stock on an as converted to common stock basis. SPH USA, which holds 100% of the outstanding Series C preferred stock and which represents approximately 20.9% of the outstanding shares of Oncternal capital stock on as converted common stock basis, but Oncternal expects it to execute a lock-up agreement prior to the closing of the merger, which is a condition to closing.

Management Following the Merger (see page 290)

Effective as of the closing of the merger, GTx's executive officers are expected to include:

Name	Title
James B. Breitmeyer, M.D., Ph.D.	President and Chief Executive Officer
Richard G. Vincent	Chief Financial Officer
Hazel M. Aker	General Counsel

Interests of Certain Directors, Officers and Affiliates of GTx and Oncternal (see pages 146 and 155)

In considering the recommendation of the GTx Board with respect to the issuance of common stock of GTx pursuant to the Merger Agreement and the other matters to be acted upon by GTx's stockholders at the GTx special meeting, GTx's stockholders should be aware that certain members of the GTx Board and executive officers of GTx have interests in the merger that may be different from, or in addition to, interests they have as GTx's stockholders. For example, GTx has entered into employment agreements with its executive officers that may result in the receipt by such executive officers of cash severance payments and other benefits upon an eligible termination of employment of each executive officer's employment.

As of March 31, 2019, GTx's directors and executive officers beneficially owned, in the aggregate approximately 39.2% of the outstanding shares of common stock of GTx. As of March 31, 2019, GTx's directors and officers beneficially owned, in the aggregate, 1,035,549 options to purchase GTx common stock, all of which will become vested immediately prior to the closing of the merger and will be entitled to an extension of the post-termination exercise period of stock options upon an eligible termination of service following the merger or upon their retirement in accordance with the applicable equity plan.

Under the Merger Agreement, as of immediately prior to the closing of the merger (but in no event more than 30 days prior to the Effective Time), GTx shall take all actions necessary to cause the termination and liquidation of the GTx Deferred Stock Rights. GTx shall also ensure that any deferrals under the GTx Director Deferred Compensation Plan on or after January 3, 2019 shall be settled only in cash and that the maximum number of shares of common stock of GTx issuable upon settlement of the GTx Deferred Stock Rights shall be limited to the number of GTx Deferred Stock Rights outstanding as of the date of the Merger Agreement. As of March 31, 2019, five of GTx's directors held Deferred Stock Rights and an aggregate of 155,426 shares of GTx common stock were issuable pursuant to the GTx Deferred Stock Rights.

In addition, Dr. Carter and Dr. Wills, each of whom is currently a director of GTx, are expected to continue as directors of the combined organization after the Effective Time.

The compensation arrangements with GTx's officers and directors are discussed in greater detail in the section entitled "The Merger—Interests of GTx Directors and Executive Officers in the Merger" in this proxy statement/prospectus/information statement.

In considering the recommendation of the Oncternal Board with respect to approving the merger and related transactions by written consent, Oncternal's stockholders should be aware that employees of Oncternal, including Oncternal's executive officers, are expected to become employees and/or executive officers of GTx upon the closing of the Merger. David F. Hale is expected to be appointed to the board as Chairman of the board of directors and James B. Breitmeyer, M.D., Ph.D. is expected to be appointed to the board pursuant to his role as Chief Executive Officer. It is anticipated that Yanjun Liu, Ph.D. and Xin Nakanishi, Ph.D. will be appointed as the designees of SPH USA and that Charles P. Theuer, M.D., Ph.D., William R. LaRue and Daniel L. Kisner, M.D. will be appointed to the remaining three director positions. It is anticipated that GTx's executive officers upon the closing of the merger will be Dr. Breitmeyer, President and Chief Executive Officer, Richard G.

Vincent, Chief Financial Officer and Hazel M. Aker, General Counsel. In addition, Oncternal's directors and executive officers and will be entitled to certain indemnification and liability insurance coverage pursuant to the terms of the Merger Agreement. Following completion of the merger, it is expected that the combined organization will provide compensation to non-employee directors. GTx's current director compensation program will be suspended at the time of the closing of the merger and the director compensation policies for the combined organization following the merger will be re-evaluated by the compensation committee and board of directors of the combined organization following completion of the merger and may be subject to change. Non-employee directors of the combined organization are, however, expected to receive annual cash retainers and equity compensation, although the amount of such compensation has not yet been determined.

As of March 31, 2019, Oncternal's directors and executive officers beneficially owned: (i) approximately 43% of the outstanding shares of common stock of Oncternal, (ii) approximately 19% of the outstanding shares of preferred stock of Oncternal, (iii) warrants to purchase 1,910,604 shares of Oncternal Series B-2 preferred stock, all of which will be converted into warrants to purchase GTx common stock in connection with the closing of the merger pursuant to the merger agreement, and (iv) options to purchase 4,920,000 shares of Oncternal common stock, all of which will be converted into options to purchase GTx common stock in connection with the closing of the merger pursuant to the Merger Agreement.

The compensation arrangements with Oncternal's officers and directors are discussed in greater detail in the section entitled "Agreements Related to the Merger—Interests of Oncternal Directors and Executive Officers in the Merger" in this proxy statement/prospectus/information statement.

Certain of Oncternal's and GTx's executive officers and directors have also entered into voting agreements, pursuant to which certain directors, officers and stockholders of Oncternal and GTx, respectively, have agreed, solely in their capacity as stockholders of Oncternal and GTx, respectively, to vote all of their shares of Oncternal capital stock or GTx's common stock in favor of the adoption or approval, respectively, of the Merger Agreement and the transactions contemplated therein in connection with the merger. The voting agreements are discussed in greater detail in the section entitled "Agreements Related to the Merger—Voting Agreements and Written Consent" in this proxy statement/prospectus/information statement.

Risk Factors (see page 26)

Both GTx and Oncternal are subject to various risks associated with their businesses and respective assets. In addition, the merger poses a number of risks to each company and its respective stockholders, including the possibility that the merger may not be completed and the following risks:

- the exchange ratio is not adjustable based on the market price of GTx's common stock, so the merger consideration at the closing may have a greater or lesser value than at the time the Merger Agreement was signed;
- failure to complete the merger may result in either GTx or Oncternal paying a termination fee or expenses to the other and could harm the price of GTx's common stock and the future business and operations of each company;
- the merger is subject to approval by the GTx stockholders and Oncternal stockholders, including Oncternal's largest stockholder, SPH USA, which has not delivered a voting agreement;
- the merger may be completed even though material adverse changes may result solely from the announcement of the merger, changes in the operations of GTx and Oncternal operate that apply to all companies generally and other causes;
- some of GTx's and Oncternal's respective officers and directors have interests that are different from or in addition to those considered by other stockholders of Oncternal and GTx and which may influence them to support or approve the merger;

- the market price of the combined organization's common stock may decline as a result of the merger;
- GTx's and Oncternal's stockholders may not realize a benefit from the merger commensurate with the ownership dilution they will experience in connection with the merger;
- during the pendency of the merger, GTx and Oncternal may not be able to enter into a business combination with another party under certain circumstances because of restrictions in the Merger Agreement, which could adversely affect their respective businesses;
- certain provisions of the Merger Agreement may discourage third parties from submitting alternative takeover proposals, including proposals that may be superior to the arrangements contemplated by the Merger Agreement;
- because the lack of a public market for shares of Oncternal's capital stock makes it difficult to evaluate the fairness of the merger, Oncternal's stockholders may receive consideration in the merger that is less than the fair market value of the shares of Oncternal's capital stock and/or GTx may pay more than the fair market value of the shares of Oncternal's capital stock; and
- if the conditions to the merger are not met, the merger will not occur.

These risks and other risks are discussed in greater detail under the section entitled "Risk Factors" in this proxy statement/prospectus/information statement. GTx and Oncternal both encourage you to read and consider all of these risks carefully.

Regulatory Approvals (see page 160)

In the United States, GTx must comply with applicable federal and state securities laws and the rules and regulations of the Nasdaq Capital Market ("Nasdaq") in connection with the issuance of shares of GTx's common stock and the filing of this proxy statement/prospectus/information statement with the SEC. As of the date hereof, the registration statement of which this proxy statement/prospectus/information statement is a part has not become effective.

Nasdaq Stock Market Listing (see page 164)

Prior to consummation of the merger, GTx intends to file an initial listing application with Nasdaq pursuant to Nasdaq Stock Market LLC "reverse merger" rules. If such application is accepted, GTx anticipates that GTx's common stock will be listed on Nasdaq following the closing of the merger under the trading symbol "ONCT."

Anticipated Accounting Treatment (see page 164)

The merger will be recorded by GTx using the reverse asset acquisition method of accounting. For accounting purposes, Oncternal is considered to be acquiring GTx in the merger.

Appraisal Rights (see page 164)

Holders of GTx's common stock are not entitled to appraisal rights in connection with the merger. Oncternal's stockholders are entitled to appraisal rights in connection with the merger under Delaware law. For more information about such rights, see the provisions of Section 262 of the DGCL attached hereto as *Annex C*, and the section entitled "The Merger—Appraisal Rights" in this proxy statement/prospectus/information statement.

Comparison of Stockholder Rights (see page 339)

Both GTx and Oncternal are incorporated under the laws of the State of Delaware and, accordingly, the rights of the stockholders of each are currently, and will continue to be, governed by the DGCL. If the merger is completed, Oncternal's stockholders will become stockholders of GTx, and their rights will be governed by the DGCL, GTx's amended and restated bylaws and, GTx's restated certificate of incorporation, as amended by the amendments set forth in *Annex D* and *Annex E*, assuming Proposal Nos. 2 and 3 are approved. The rights of GTx's stockholders contained in GTx's restated certificate of incorporation and GTx's amended and restated bylaws differ from the rights of Oncternal's stockholders under Oncternal's amended and restated certificate of incorporation and Oncternal's bylaws, as more fully described under the section entitled "Comparison of Rights of Holders of GTx Stock and Oncternal Stock" in this proxy statement/prospectus/information statement.

SELECTED HISTORICAL AND UNAUDITED PRO FORMA CONDENSED COMBINED FINANCIAL DATA

The following tables present summary historical financial data for GTx and Oncternal, summary unaudited pro forma condensed financial data for GTx and Oncternal, and comparative historical and unaudited pro forma per share data for GTx and Oncternal.

Selected Historical Financial Data of GTx

The selected financial data as of December 31, 2018 and 2017 and for the years ended December 31, 2018 and 2017 are derived from the GTx audited financial statements prepared using accounting principles generally accepted in the United States ("U.S. GAAP"), which are included in this proxy statement/prospectus/information statement. The financial data should be read in conjunction with "GTx Management's Discussion and Analysis of Financial Condition and Results of Operations" and GTx's financial statements and related notes appearing elsewhere in this proxy statement/prospectus/information statement. GTx's historical results are not necessarily indicative of results to be expected in any future period.

	Years Ended December 31,	
	2018	2017
Statements of Operations Data (in thousands, except per share data):		
Operating expenses:		
Research and development	$ 29,669	$ 21,467
General and administrative	9,390	9,188
Total operating expenses	39,059	30,655
Loss from operations	(39,059)	(30,655)
Other income, net	641	216
Net loss	$ (38,418)	$ (30,439)
Net loss per share, basic and diluted	$ (1.65)	$ (1.75)
Weighted-average shares of common stock outstanding, basic and diluted	23,346,231	17,441,280

	December 31, 2018	December 31, 2017
Balance Sheet Data (in thousands):		
Cash, cash equivalents and short-term investments (a)	$ 28,458	$ 43,899
Working capital (b)	25,998	38,102
Total assets	31,321	46,236
Accumulated deficit	(600,055)	(561,637)
Total stockholders' equity	26,111	38,261

(a) Cash, cash equivalents and short-term investments for the year ended December 31, 2018 includes the net proceeds of $24.5 million received from the sale of common stock under our At-the-Market Equity Offering SM Sales Agreement with Stifel, Nicolaus & Company, Incorporated, in May 2018. Cash, cash equivalents and short-term investments for the year ended December 31, 2017 includes the net proceeds of $45.6 million received from the private placement of common stock and warrants completed in September 2017.

(b) Working capital is defined as current assets less current liabilities.

Selected Historical Consolidated Financial Data of Oncternal

The selected consolidated financial data as of December 31, 2018 and 2017 and for the years ended December 31, 2018 and 2017 are derived from Oncternal's audited consolidated financial statements prepared using U.S. GAAP, which are included in this proxy statement/prospectus/information statement. These historical results are not necessarily indicative of results to be expected in any future period. The selected consolidated financial data should be read in conjunction with Oncternal's consolidated financial statements and the related notes to those statements included in this proxy statement/prospectus/information statement and "Oncternal Management's Discussion and Analysis of Financial Condition and Results of Operations."

	Years Ended December 31, 2018	Years Ended December 31, 2017
Selected Consolidated Statements of Operations Data (in thousands, except per share data):		
Grant revenue	$ 2,521	$ 1,674
Operating expenses:		
Research and development	8,287	9,363
General and administrative	1,820	2,871
Total operating expenses	10,107	12,234
Loss from operations	(7,586)	(10,560)
Other income (expense):		
Change in fair value of warrant liability	713	124
Other income	216	—
Interest income	79	10
Interest expense	(1)	(10)
Total other income (expense)	1,007	124
Net loss	$ (6,579)	$ (10,436)
Net loss per share, basic and diluted	$ (0.13)	$ (0.23)
Weighted average shares of common stock outstanding, basic and diluted	48,930,354	45,914,263

	December 31, 2018	December 31, 2017
Selected Consolidated Balance Sheet Data (in thousands):		
Cash and cash equivalents	$ 20,645	$ 10,188
Working capital (a)	16,879	6,558
Total assets	21,962	11,069
Warrant liability	674	1,387
Convertible preferred stock	46,588	28,715
Total stockholders' deficit	(29,631)	(23,278)

(a) Working capital is defined as current assets less current liabilities.

Selected Unaudited Pro Forma Condensed Combined Financial Data of GTx and Oncternal

The following information does not give effect to the GTx Reverse Stock Split described in Proposal No. 2 discussed in this proxy statement/prospectus/information statement.

The following selected unaudited pro forma condensed combined financial data was prepared using the reverse asset acquisition method of accounting under U.S. GAAP. For accounting purposes, Oncternal is considered to be acquiring GTx and the merger is expected to be accounted for as an asset acquisition as the fair value of the acquired preclinical assets is deemed to be substantially concentrated in a group of similar assets that do not meet the definition of a business. The GTx and Oncternal unaudited pro forma combined balance sheet data assume that the merger took place on December 31, 2018, and combines the GTx and Oncternal historical balance sheets at December 31, 2018. The GTx and Oncternal unaudited pro forma condensed combined statements of operations data assume that the merger took place as of January 1, 2018, and combines the historical results of GTx and Oncternal for the year ended December 31, 2018.

The selected unaudited pro forma condensed combined financial data are presented for illustrative purposes only and are not necessarily indicative of the combined financial position or results of operations of future periods or the results that actually would have been realized had the entities been a single entity during these periods. The selected unaudited pro forma condensed combined financial data as of and for the year ended December 31, 2018 are derived from the unaudited pro forma condensed combined financial information and should be read in conjunction with that information. For more information, please see the section entitled "Unaudited Pro Forma Condensed Combined Financial Information" in this proxy statement/prospectus/information statement.

The unaudited pro forma condensed combined financial information assumes that, at the Effective Time, each share of Oncternal common stock will be converted into the right to receive shares of GTx common stock such that, immediately following the Effective Time, GTx's stockholders as of immediately prior to the Effective Time are expected to own approximately 25% of the outstanding common stock of GTx, and Oncternal's stockholders as of immediately prior to the Effective Time are expected to own approximately 75% of the outstanding common stock of GTx, and is subject to adjustment to account for the occurrence of certain events discussed elsewhere in this proxy statement/prospectus/information statement. The ownership percentage to be held by GTx's stockholders is subject to adjustment prior to closing of the merger, including a downward adjustment to the extent that GTx's "Parent Cash Amount" (as defined in the Merger Agreement) at the Effective Time is less than the threshold provided in the Merger Agreement, which adjusts based on the date of closing (and as a result, GTx stockholders could own less, and Oncternal stockholders could own more, of the combined organization), an upward adjustment to the extent that GTx's Parent Cash Amount at the Effective Time is greater than the threshold provided in the Merger Agreement, which adjusts based on the date of closing (and as a result, GTx stockholders could own more, and Oncternal stockholders could own less, of the combined organization), or an upward adjustment to the extent that Oncternal's "Company Cash Amount" (as defined in

the Merger Agreement) at the Effective Time is less than $10,500,000 (and as a result, GTx stockholders could own more, and Oncternal stockholders could own less, of the combined organization). The exchange ratio formula excludes Oncternal's outstanding stock options and warrants and GTx's outstanding stock options and warrants.

	Year Ended December 31, 2018
Selected Unaudited Pro Forma Condensed Combined Statement of Operations (in thousands, except per share data)	
Grant revenue	$ 2,521
Total operating expenses	48,948
Net loss	(45,492)
Net loss per share, basic and diluted	(0.56)

	As of December 31, 2018
Selected Unaudited Pro Forma Condensed Combined Balance Sheet Data (in thousands)	
Cash, cash equivalents and short-term investments	$ 40,026
Total assets	44,206
Total liabilities	9,323
Stockholders' equity	34,883

Comparative Historical and Unaudited Pro Forma Per Share Data

The information below reflects the historical net loss and book value per share of GTx common stock and the historical net loss and book value per share of Oncternal common stock in comparison with the unaudited pro forma net loss and book value per share after giving effect to the proposed merger of GTx with Oncternal on a pro forma basis. The unaudited pro forma net loss and book value per share does not give effect to the GTx Reverse Stock Split.

You should read the tables below in conjunction with the audited financial statements of GTx included in this proxy statement/prospectus/information statement and the audited financial statements of Oncternal included in this proxy statement/prospectus/information statement and the related notes and the unaudited pro forma condensed combined financial information and notes related to such financial statements included elsewhere in this proxy statement/prospectus/information statement.

	Year Ended December 31, 2018
GTx Historical Per Share Data	
Net loss per share, basic and diluted	$ (1.65)
Book value per share	$ 1.12
Oncternal Historical Per Share Data	
Net loss per share, basic and diluted	$ (0.13)
Book value per share	$ (0.61)
Combined Organization Per Share Data	
Net loss per share, basic and diluted	$ (0.56)
Book value per share	$ 0.43

RISK FACTORS

The combined organization will be faced with a market environment that cannot be predicted and that involves significant risks, many of which will be beyond its control. In addition to the other information contained in this proxy statement/prospectus/information statement, you should carefully consider the material risks described below before deciding how to vote your shares of stock. In addition, you should read and consider the risks associated with GTx's business because these risks may also affect the combined organization — these risks can be found under the heading "Risk Factors — Risks Related to GTx" in this proxy statement/prospectus/information statement and in GTx's Annual Report on Form 10-K, as updated by subsequent Quarterly Reports on Form 10-Q, and other documents GTx has filed with the SEC and incorporated by reference into this proxy statement/prospectus/information statement. You should also read and consider the other information in this proxy statement/prospectus/information statement and the other documents incorporated by reference into this proxy statement/prospectus/information statement. Please see the section entitled "Where You Can Find More Information" in this proxy statement/prospectus/information statement.

Risks Related to the Merger

The exchange ratio set forth in the Merger Agreement is not adjustable based on the market price of GTx common stock, so the merger consideration at the closing of the merger may have a greater or lesser value than at the time the Merger Agreement was signed.

The Merger Agreement has set the exchange ratio for the Oncternal capital stock, and the exchange ratio is based on the outstanding capital stock of Oncternal and the outstanding common stock of GTx, in each case immediately prior to the closing of the merger as described under the heading "The Merger—Merger Consideration." Applying the exchange ratio formula in the Merger Agreement, the former Oncternal stockholders immediately before the merger are expected to own approximately 75% of the outstanding capital stock of GTx immediately following the merger, and the stockholders of GTx immediately before the merger are expected to own approximately 25% of the outstanding capital stock of GTx immediately following the merger, subject to certain assumptions. Under certain circumstances further described in the Merger Agreement, however, these ownership percentages may be adjusted upward or downward based on cash levels of the respective companies at the closing of the merger, and as a result, either GTx's stockholders or the Oncternal stockholders could own less of the combined company than expected.

Any changes in the market price of GTx's common stock before the completion of the merger will not affect the number of shares of GTx's common stock issuable to Oncternal's stockholders pursuant to the Merger Agreement. Therefore, if before the completion of the merger the market price of GTx's common stock declines from the market price on the date of the Merger Agreement, then Oncternal's stockholders could receive merger consideration with substantially lower value than the value of such merger consideration on the date of the Merger Agreement. Similarly, if before the completion of the merger the market price of GTx's common stock increases from the market price of GTx's common stock on the date of the Merger Agreement, then Oncternal's stockholders could receive merger consideration with substantially greater value than the value of such merger consideration on the date of the Merger Agreement. The Merger Agreement does not include a price-based termination right. Because the exchange ratio does not adjust as a result of changes in the market price of GTx's common stock, for each one percentage point change in the market price of GTx's common stock, there is a corresponding one percentage point rise or decline, respectively, in the value of the total merger consideration payable to Oncternal's stockholders pursuant to the Merger Agreement.

Failure to complete the merger may result in either GTx or Oncternal paying a termination fee to the other party and could significantly harm the market price of GTx's common stock and negatively affect the future business and operations of each company.

If the merger is not completed and the Merger Agreement is terminated under certain circumstances, GTx or Oncternal may be required to pay the other party a termination fee of up to $2.0 million. Even if a termination fee

is not payable in connection with a termination of the Merger Agreement, each of GTx and Oncternal will have incurred significant fees and expenses, which must be paid whether or not the merger is completed. Further, if the merger is not completed, it could significantly harm the market price of GTx's common stock.

In addition, if the Merger Agreement is terminated and the board of directors of GTx or Oncternal determines to seek another business combination, there can be no assurance that either GTx or Oncternal will be able to find a partner and close an alternative transaction on terms that are as favorable or more favorable than the terms set forth in the Merger Agreement.

The merger is subject to approval of the Merger Agreement by GTx's stockholders and the Oncternal stockholders. Failure to obtain these approvals would prevent the closing of the merger.

Before the merger can be completed, the stockholders of each of GTx and Oncternal must approve the Merger Agreement. Additionally, the Merger Agreement must be approved by multiple classes of Oncternal preferred stockholders, one class of which is held by a sole stockholder, SPH USA, which has not executed a voting agreement and has not otherwise agreed to vote in favor of the Merger Agreement. Although Oncternal expects to receive stockholder approval from SPH USA approximately two months after the date of the Merger Agreement, there can be no assurance that all of the necessary stockholder approvals will be obtained. Failure to obtain the required stockholder approvals, including as a result of SPH USA refusing to approve the transactions contemplated by the Merger Agreement, may result in a material delay in, or the abandonment of, the merger. Any delay in completing the merger may materially adversely affect the timing and benefits that are expected to be achieved from the merger.

The merger may be completed even though certain events occur prior to the closing that materially and adversely affect GTx or Oncternal.

The Merger Agreement provides that either GTx or Oncternal can refuse to complete the merger if there is a material adverse change affecting the other party between March 6, 2019, the date of the Merger Agreement, and the closing of the merger. However, certain types of changes do not permit either party to refuse to complete the merger, even if such change could be said to have a material adverse effect on GTx or Oncternal, including:

- general business, economic or political conditions or conditions generally affecting the industries in which Oncternal or GTx, as applicable, operates;
- any natural disaster or any acts of war, armed hostilities or terrorism;
- any changes in financial, banking or securities markets;
- with respect to GTx, any change in the stock price or trading volume of GTx excluding any underlying effect that may have caused such change;
- with respect to GTx, failure to meet internal or analysts' expectations or projects or the results of operations;
- any clinical trial programs or studies, including any adverse data, event or outcome arising out of or related to any such programs or studies;
- any change in accounting requirements or principles or any change in applicable laws, rules, or regulations or the interpretation thereof;
- any effect resulting from the announcement or pendency of the merger or any related transactions; and
- the taking of any action, or the failure to take any action, by either GTx or Oncternal required to comply with the terms of the Merger Agreement.

If adverse changes occur and GTx and Oncternal still complete the merger, the market price of the combined organization's common stock may suffer. This in turn may reduce the value of the merger to the stockholders of GTx, Oncternal or both.

Some GTx and Oncternal officers and directors have interests in the merger that are different from the respective stockholders of GTx and Oncternal and that may influence them to support or approve the merger without regard to the interests of the respective stockholders of GTx and Oncternal.

Certain officers and directors of GTx and Oncternal participate in arrangements that provide them with interests in the merger that are different from the interests of the respective stockholders of GTx and Oncternal, including, among others, the continued service as an officer or director of the combined organization, severance benefits, the acceleration of stock option vesting, continued indemnification and the potential ability to sell an increased number of shares of common stock of the combined organization in accordance with Rule 144 under the Securities Act of 1933, as amended.

For example, GTx has entered into employment agreements with its executive officers that may result in the receipt by such executive officers of cash severance payments and other benefits in the event of a covered termination of employment of each executive officer's employment. For more information concerning the treatment of GTx's stock options in connection with the merger, see the section entitled "The Merger Agreement—Treatment of GTx's Stock Awards and Warrants" in this proxy statement/prospectus/information statement. The closing of the merger will also result in the acceleration of vesting of options to purchase shares of GTx's common stock held by GTx's executive officers and directors, whether or not there is a covered termination of such officer's employment. In addition, and for example, certain of Oncternal's directors and executive officers have options, subject to vesting, to purchase shares of Oncternal's common stock which, at the closing of the merger, shall be converted into and become options to purchase shares of GTx's common stock, certain of Oncternal's directors and executive officers are expected to become directors and executive officers of GTx upon the closing of the merger, and all of Oncternal's directors and executive officers are entitled to certain indemnification and liability insurance coverage pursuant to the terms of the Merger Agreement. These interests, among others, may influence the officers and directors of GTx and Oncternal to support or approve the merger. For more information concerning the interests of GTx's and Oncternal's executive officers and directors, see the sections entitled "The Merger— Interests of GTx Directors and Executive Officers in the Merger" and "The Merger—Interests of Oncternal Directors and Executive Officers in the Merger."

The market price of GTx's common stock following the merger may decline as a result of the merger.

The market price of GTx's common stock may decline as a result of the merger for a number of reasons including if:

- investors react negatively to the prospects of the combined organization's product candidates, business and financial condition following the merger;
- the effect of the merger on the combined organization's business and prospects is not consistent with the expectations of financial or industry analysts; or
- the combined organization does not achieve the perceived benefits of the merger as rapidly or to the extent anticipated by financial or industry analysts.

GTx and Oncternal securityholders will have a reduced ownership and voting interest in, and will exercise less influence over the management of, the combined organization following the closing of the merger as compared to their current ownership and voting interest in the respective companies.

After the completion of the merger, the current securityholders of GTx and Oncternal will own a smaller percentage of the combined organization than their ownership in their respective companies prior to the merger. Immediately after the merger, it is currently estimated that Oncternal securityholders will own approximately 75% of the common stock of the combined organization, and GTx securityholders, whose shares of GTx common stock will remain outstanding after the merger, will own approximately 25% of the common stock of the combined organization. These estimates are based on the anticipated exchange ratio and are subject to adjustment as provided in the Merger Agreement. See also the risk factor above titled, "*The exchange ratio set*

forth in the Merger Agreement is not adjustable based on the market price of GTx common stock, so the merger consideration at the closing of the merger may have a greater or lesser value than at the time the Merger Agreement was signed."

In addition, the nine member board of directors of the company will initially include six individuals with prior affiliations with Oncternal and two individuals with prior affiliations with GTx. Consequently, securityholders of GTx and Oncternal will be able to exercise less influence over the management and policies of the combined organization following the closing of the merger than they currently exercise over the management and policies of their respective companies.

GTx and Oncternal stockholders may not realize a benefit from the merger commensurate with the ownership dilution they will experience in connection with the merger.

If the combined organization is unable to realize the strategic and financial benefits currently anticipated from the merger, GTx's and Oncternal's stockholders will have experienced substantial dilution of their ownership interests in their respective companies without receiving the expected commensurate benefit, or only receiving part of the commensurate benefit to the extent the combined organization is able to realize only part of the expected strategic and financial benefits currently anticipated from the merger.

The combined company will need to raise additional capital by issuing securities or debt or through licensing or other strategic arrangements, which may cause dilution to the combined company's stockholders or restrict the combined company's operations or impact its proprietary rights.

The combined company may be required to raise additional funds sooner than currently planned. In this regard, while the exchange ratio may be impacted by cash levels of the respective companies at the closing of the Merger, the Merger Agreement does not condition the completion of the merger upon either company holding a minimum amount of cash at the Effective Time. If either or both of GTx or Oncternal hold less cash at the time of the closing merger than the parties currently expect, the combined company will need to raise additional capital sooner than expected. Additional financing may not be available to the combined company when it needs it or may not be available on favorable terms. To the extent that the combined company raises additional capital by issuing equity securities, such an issuance may cause significant dilution to the combined company's stockholders' ownership and the terms of any new equity securities may have preferences over the combined company's common stock. Any debt financing the combined company enters into may involve covenants that restrict its operations. These restrictive covenants may include limitations on additional borrowing and specific restrictions on the use of the combined company's assets, as well as prohibitions on its ability to create liens, pay dividends, redeem its stock or make investments. In addition, if the combined company raises additional funds through licensing, partnering or other strategic arrangements, it may be necessary to relinquish rights to some of the combined company's technologies or product candidates and proprietary rights, or grant licenses on terms that are not favorable to the combined company.

During the pendency of the merger, GTx and Oncternal may not be able to enter into a business combination with another party at a favorable price because of restrictions in the Merger Agreement, which could adversely affect their respective businesses.

Covenants in the Merger Agreement impede the ability of GTx and Oncternal to make acquisitions, subject to certain exceptions relating to fiduciary duties, as set forth below, or to complete other transactions that are not in the ordinary course of business pending completion of the merger. As a result, if the merger is not completed, the parties may be at a disadvantage to their competitors during such period. In addition, while the Merger Agreement is in effect, each party is generally prohibited from soliciting, initiating, encouraging or entering into certain extraordinary transactions, such as a merger, sale of assets, or other business combination outside the ordinary course of business with any third-party, subject to certain exceptions relating to fiduciary duties. Any such transactions could be favorable to such party's stockholders.

Certain provisions of the Merger Agreement may discourage third parties from submitting alternative takeover proposals, including proposals that may be superior to the arrangements contemplated by the Merger Agreement.

The terms of the Merger Agreement prohibit each of GTx and Oncternal from soliciting alternative takeover proposals or cooperating with persons making unsolicited takeover proposals, except in limited circumstances when such party's board of directors determines in good faith that an unsolicited alternative takeover proposal is or is reasonably likely to lead to a superior takeover proposal and that failure to cooperate with the proponent of the proposal would be reasonably likely to be inconsistent with the applicable board's fiduciary duties.

Because the lack of a public market for Oncternal's capital stock makes it difficult to evaluate the value of Oncternal's capital stock, the stockholders of Oncternal may receive shares of GTx's common stock in the merger that have a value that is less than, or greater than, the fair market value of Oncternal's capital stock.

The outstanding capital stock of Oncternal is privately held and is not traded in any public market. The lack of a public market makes it extremely difficult to determine the fair market value of Oncternal. Because the percentage of GTx's common stock to be issued to Oncternal's stockholders was determined based on negotiations between the parties, it is possible that the value of GTx's common stock to be received by Oncternal's stockholders will be less than the fair market value of Oncternal, or GTx may pay more than the aggregate fair market value for Oncternal.

If the conditions to the merger are not met, the merger will not occur.

Even if the merger is approved by the stockholders of GTx and Oncternal, specified conditions must be satisfied or waived to complete the merger. These conditions are set forth in the Merger Agreement and described in the section entitled "The Merger Agreement—Conditions to the Completion of the Merger" in this proxy statement/prospectus/information statement. GTx cannot assure you that all of the conditions will be satisfied or waived. If the conditions are not satisfied or waived, the merger will not occur or will be delayed, and GTx and Oncternal each may lose some or all of the intended benefits of the merger.

Litigation relating to the merger could require GTx or Oncternal to incur significant costs and suffer management distraction, and could delay or enjoin the merger.

GTx and Oncternal could be subject to demands or litigation related to the merger, whether or not the merger is consummated. Such actions may create uncertainty relating to the merger, or delay or enjoin the merger, and responding to such demands.

Risks Related to GTx

Risks Related to GTx's Financial Condition and GTx's Need for Additional Financing, and Additional Risks Related to the Merger

There is no assurance that the merger will be completed in a timely manner or at all. If the merger is not consummated, GTx's business could suffer materially and GTx's stock price could decline.

The closing of the merger is subject to the satisfaction or waiver of a number of closing conditions, as described above, including the required approvals by GTx and Oncternal stockholders (including stockholder approval from one of Oncternal's significant stockholders, SPH USA, which holds all of the outstanding shares of one series of Oncternal's preferred stock that must approve the transactions contemplated by the Merger Agreement) and other customary closing conditions. See the risk factors above titled, "*The merger is subject to approval of the Merger Agreement by GTx's stockholders and the Oncternal stockholders. Failure to obtain these approvals would prevent the closing of the merger*" and "*If the conditions to the merger are not met, the merger will not occur.*" If the conditions are not satisfied or waived, including as a result of SPH USA refusing to approve the

transactions contemplated by the Merger Agreement, the merger may be materially delayed or abandoned. If the merger is not consummated, GTx's ongoing business may be adversely affected and, without realizing any of the benefits of having consummated the merger, GTx will be subject to a number of risks, including the following:

- GTx has incurred and expects to continue to incur significant expenses related to the merger even if the merger is not consummated;
- GTx could be obligated to pay Oncternal a termination fee of up to $2.0 million under certain circumstances set forth in the Merger Agreement;
- the market price of GTx's common stock may decline to the extent that the current market price reflects a market assumption that the merger will be completed; and
- matters relating to the merger have required and will continue to require substantial commitments of time and resources by GTx's remaining management and employees, which could otherwise have been devoted to other opportunities that may have been beneficial to us.

GTx also could be subject to litigation related to any failure to consummate the merger or to perform its obligations under the Merger Agreement. If the merger is not consummated, these risks may materialize and may adversely affect its business, financial condition and the market price of GTx's common stock.

If the merger is not completed, GTx may be unsuccessful in completing an alternative transaction on terms that are as favorable as the terms of the merger with Oncternal, or at all, and GTx may otherwise be unable to continue to operate its business. The GTx Board may decide to pursue a dissolution and liquidation of GTx. In such an event, the amount of cash available for distribution to its stockholders will depend heavily on the timing of such liquidation as well as the amount of cash that will need to be reserved for commitments and contingent liabilities.

GTx's assets currently consist primarily of cash, cash equivalents and short-term investments, GTx's SARD and SARM assets, the remaining value, if any, of GTx's deferred tax assets, GTx's listing on the Nasdaq Capital Market and the Merger Agreement with Oncternal. While GTx has entered into the Merger Agreement with Oncternal, the closing of the merger may be delayed or may not occur at all and there can be no assurance that the merger will deliver the anticipated benefits GTx expects or enhance stockholder value. If GTx is unable to consummate the merger, the GTx Board may elect to pursue an alternative strategy, one of which may be a strategic transaction similar to the merger. Attempting to complete an alternative transaction like the merger will be costly and time consuming, and GTx can make no assurances that such an alternative transaction would occur at all. Alternatively, the GTx Board may elect to continue its operations to advance appropriate SARD compounds into the additional preclinical studies required to submit an IND and potentially advance one of GTx's SARD compounds into a first-in-human clinical trial, which would require that GTx obtain additional funding, and to resume its efforts to seek potential collaborative, partnering or other strategic arrangements for GTx's SARM assets, including a sale or other divestiture of its SARM assets, or the GTx Board could instead decide to pursue a dissolution and liquidation of GTx's company. In such an event, the amount of cash available for distribution to GTx's stockholders will depend heavily on the timing of such decision, as with the passage of time the amount of cash available for distribution will be reduced as GTx continues to fund GTx's operations. In addition, if the GTx Board were to approve and recommend, and GTx's stockholders were to approve, a dissolution and liquidation of GTx's company, GTx would be required under Delaware corporate law to pay GTx's outstanding obligations, as well as to make reasonable provision for contingent and unknown obligations, prior to making any distributions in liquidation to GTx's stockholders. GTx's commitments and contingent liabilities may include severance obligations, regulatory and preclinical obligations, and fees and expenses related to the merger. As a result of this requirement, a portion of GTx's assets may need to be reserved pending the resolution of such obligations. In addition, GTx may be subject to litigation or other claims related to a dissolution and liquidation. If a dissolution and liquidation were pursued, the GTx Board, in consultation with its advisors, would need to evaluate these matters and make a determination about a reasonable amount to reserve. Accordingly, holders of GTx's common stock could lose all or a significant portion of their investment in the event of a liquidation, dissolution or winding up of the company.

The issuance of shares of GTx's common stock to Oncternal stockholders in the merger will substantially dilute the voting power of GTx's current stockholders.

If the merger is completed, each outstanding share of Oncternal common stock will be converted into the right to receive a number of shares of GTx's common stock equal to the exchange ratio determined pursuant to the Merger Agreement. Immediately following the merger, the former Oncternal stockholders immediately before the Merger are expected to own approximately 75% of GTx's outstanding capital stock, and GTx's stockholders immediately before the merger are expected to own approximately 25% of GTx's outstanding capital stock, subject to certain assumptions. Accordingly, the issuance of shares of GTx's common stock to Oncternal stockholders in the merger will reduce significantly the relative voting power of each share of GTx common stock held by GTx's current stockholders. Consequently, GTx's stockholders as a group will have significantly less influence over the management and policies of the combined company after the merger than prior to the merger. These estimates are based on the anticipated exchange ratio and are subject to adjustment as provided in the Merger Agreement. See also the risk factor above titled, "*The exchange ratio set forth in the Merger Agreement is not adjustable based on the market price of GTx common stock, so the merger consideration at the closing of the merger may have a greater or lesser value than at the time the Merger Agreement was signed.*"

GTx stockholders may not receive any payment on the CVRs and the CVRs may otherwise expire valueless.

If the merger is completed, GTx and certain other parties will enter into the CVR Agreement pursuant to which, for each share of GTx common stock held, GTx stockholders of record as of immediately prior to the Effective Time will receive one CVR entitling such holders to receive in the aggregate 50% of any net proceeds received during the 15-year period after the closing of the merger from the grant, sale or transfer of rights to GTx's SARD or SARM technology that occurs during the 10-year period after the closing of the merger (or in the 11th year if based on a term sheet approved during the initial 10-year period) and, if applicable, to receive royalties on the sale of any SARD products or SARM products by the combined company during the 15-year period after the closing of the merger. In light of the results of the ASTRID trial, Oncternal has no current intent to develop the SARM program. The CVRs will not be transferable, will not have any voting or dividend rights, and interest will not accrue on any amounts potentially payable on the CVRs. Accordingly, the right of any GTx stockholder to receive any future payment on or derive any value form the CVRs will be contingent solely upon the achievement of the foregoing events within the time periods specified in the CVR Agreement and if these events are not achieved for any reason within the time periods specified in the CVR Agreement, no payments will be made under the CVRs, and the CVRs will expire valueless. In addition, Oncternal (as successor in interest to GTx) has agreed only to use commercially reasonable efforts to develop SARD products and to divest its SARM technology, subject to certain limitations, which allows for the consideration of a variety of factors in determining the efforts that the combined company is required to use to develop SARD products and to divest GTx's SARM technology, and it does not require the combined company to take all possible actions to continue efforts to develop SARD products and to divest GTx's SARM technology. Accordingly, under certain circumstances the combined company may not be required to continue efforts to develop SARD products and to divest GTx's SARM technology, or may allocate resources to other projects, which would have an adverse effect on the value, if any, of the CVRs. Furthermore, the CVRs will be unsecured obligations of the combined company and all payments under the CVRs, all other obligations under the CVR Agreement and the CVRs and any rights or claims relating thereto will be subordinated in right of payment to the prior payment in full of all current or future senior obligations of the combined company. Finally, the U.S. federal income tax treatment of the CVRs is unclear. There is no legal authority directly addressing the U.S. federal income tax treatment of the receipt of, and payments on, the CVRs, and there can be no assurance that the Internal Revenue Service (the "IRS"), would not assert, or that a court would not sustain, a position that could result in adverse U.S. federal income tax consequences to holders of the CVRs.

GTx has incurred losses since inception, and GTx anticipates that it will incur continued losses for the foreseeable future.

As of December 31, 2018, GTx had an accumulated deficit of $600.1 million. GTx's net loss for the year ended December 31, 2018 was $38.4 million and it expects to incur significant operating losses for the foreseeable future depending on the extent of its preclinical and any clinical development activities and, if any such development activities are successful, potentially seeking regulatory approval of any potential future product candidates. These losses, among other things, have had and will continue to have an adverse effect on GTx's stockholders' equity and working capital.

A substantial portion of GTx's recent efforts and expenditures have been devoted to, and its prospects were substantially dependent upon, the development of enobosarm for the treatment of postmenopausal women with SUI. However, in September 2018, GTx announced that its placebo-controlled Phase 2 clinical trial of enobosarm to evaluate the change in frequency of daily SUI episodes following 12 weeks of treatment (the "ASTRID trial"), failed to achieve statistical significance on the primary endpoint of the proportion of patients with a greater than 50% reduction in incontinence episodes per day compared to placebo. The failure of the ASTRID trial to achieve its primary endpoint has significantly depressed GTx's stock price and has severely harmed GTx's ability to raise additional capital and to secure potential collaborative, partnering or other strategic arrangements for its SARM assets, and consequently, GTx's prospects to continue as a going concern have been severely diminished. Following GTx's review of the full data sets from the ASTRID trial, it determined to discontinue further development of enobosarm to treat SUI and to otherwise discontinue any further development of its SARM program generally. GTx continues its efforts to seek potential collaborative, partnering or other strategic arrangements for its SARM assets, including a sale or other divestiture of its SARM assets. GTx has for many years actively pursued, but has been unable to successfully enter into, potential collaborative, partnering or other strategic arrangements for its SARM assets. If GTx is unable to ultimately enter into any such arrangements for its SARM assets, it will not receive any return on its investment in enobosarm and its other SARMs.

As a result of GTx's decision to discontinue its SARM development efforts, GTx's development activities are focused solely on completing ongoing preclinical studies in order to select the most appropriate SARD compounds to move forward into the additional preclinical studies required to submit an IND and potentially advance one of its SARD compounds into a first-in-human clinical trial. However, while GTx believes that its existing capital resources will be adequate to enable it to conduct and complete planned IND-enabling preclinical studies of its SARD compounds, GTx will require significant additional financial resources in order to initiate and complete initial human clinical trials of a SARD compound and to otherwise further the development of its SARD program. Accordingly, if, for any reason, the merger is not consummated, GTx may resume its efforts to seek additional funds through potential collaborative, partnering or other strategic arrangements to provide it with the necessary resources for the development of its SARD program. In addition, the preclinical evaluation of GTx's SARD technology is at a very early stage and is subject to the substantial risk and probability of failure inherent in the development of early-stage programs.

Because of the numerous risks and uncertainties associated with developing and commercializing small molecule drugs, GTx is unable to predict the extent of any future losses or when GTx will become profitable, if at all. GTx has funded its operations primarily through public offerings and private placements of its securities, as well as payments from its former collaborators. GTx also previously recognized product revenue from the sale of FARESTON, the rights to which it sold to a third-party in the third quarter of 2012. Currently, GTx has no ongoing collaborations for the development and commercialization of its product candidates, and as a result of the sale of its rights and certain assets related to FARESTON, GTx also currently has no sources of revenue.

If the merger is not completed and GTx is unable to raise sufficient additional funds for the development of its SARD program, whether through potential collaborative, partnering or other strategic arrangements or otherwise, or if GTx otherwise determines to discontinue the development of its SARD program, GTx will likely determine to cease operations. Even if GTx is able to raise additional funds to permit the continued development of its

SARD program, if GTx and/or any potential collaborators are unable to develop and commercialize its SARDs or SARM technology, if development is further delayed or is eliminated, or if sales revenue from any SARD or partnered SARM products upon receiving marketing approval, if ever, is insufficient, GTx may never become profitable and it will not be successful.

If GTx does not successfully complete the merger, it will need to raise substantial additional capital and may be unable to raise the capital necessary to permit the continued development of its SARD program, which would force GTx to delay, reduce or eliminate its SARD program and would likely cause it to cease operations.

At December 31, 2018, GTx had cash, cash equivalents and short-term investments of $28.5 million. If the merger is not completed, based on GTx's current business plan and spending assumptions as a standalone company, GTx estimates that its current cash, cash equivalents and short-term investments, together with interest thereon, will be sufficient to meet its projected operating requirements for at least the next 12 months. GTx has based its cash sufficiency estimates on its current business plan and its assumptions that may prove to be wrong. GTx could utilize its available capital resources sooner than it currently expects, and it could need additional funding sooner than currently anticipated.

While GTx believes that its existing capital resources will be adequate to enable it to conduct and complete planned IND-enabling preclinical studies of SARD compounds, it will require significant additional financial resources in order to initiate and complete initial human clinical trials of a SARD compound and to otherwise further the development of its SARD program. If GTx is unable to raise sufficient additional funds for the development of its SARD program, whether through potential collaborative, partnering or other strategic arrangements or otherwise, or if GTx otherwise determines to discontinue the development of its SARD program, GTx will likely determine to cease operations.

GTx's future funding requirements will depend on many factors, including:

- its ability to successfully complete the merger;
- the scope, rate of progress and cost of its preclinical and potential future clinical development programs;
- the terms and timing of any potential collaborative, partnering and other strategic arrangements that GTx may establish;
- the amount and timing of any licensing fees, milestone payments and royalty payments from potential collaborators, if any;
- potential future clinical trial results;
- the cost and timing of regulatory filings and/or approvals to commercialize any potential future product candidates and any related restrictions, limitations, and/or warnings in the label of an approved product candidate;
- the effect of competing technological and market developments; and
- the cost of filing, prosecuting, defending and enforcing any patent claims and other intellectual property rights, and the cost of defending any other litigation claims.

While GTx has been able to fund its operations to date, GTx has no ongoing collaborations for the development and commercialization of any product candidates and no source of revenue, nor does it expect to generate product revenue for the foreseeable future. GTx does not have any commitments for future external funding. In addition, although GTx has entered into an At-the-Market Equity Offering SM Sales Agreement with Stifel, Nicolaus & Company, Incorporated (the "ATM Sales Agreement"), under which approximately $25.0 million of shares of its common stock remained available for sale at December 31, 2018, it is unlikely GTx could raise sufficient funds under the ATM Sales Agreement to permit it to initiate and complete initial human clinical trials

of a SARD compound, and given its currently-depressed stock price, the ATM Sales Agreement is not otherwise expected to be a practical source of liquidity for GTx at this time. Further, given GTx's currently-depressed stock price, it is significantly limited in its ability to sell shares of common stock under the ATM Sales Agreement since the issuance and sale of GTx's common stock under the ATM Sales Agreement, if it occurs, would be effected under a registration statement on Form S-3 that it filed with the Securities and Exchange Commission, and in accordance with the rules governing those registration statements, GTx generally can only sell shares of its common stock under that registration statement in an amount not to exceed one-third of its public float, which limitation for all practical purposes precludes its ability to obtain any meaningful funding through the ATM Sales Agreement at this time.

Until GTx can generate a sufficient amount of product revenue, which it may never do, it will need to finance future cash needs through potential collaborative, partnering or other strategic arrangements, as well as through public or private equity offerings or debt financings or a combination of the foregoing. If GTx is unable to raise additional funds, it will need to continue to reduce its expenditures in order to preserve its cash. Further cost-cutting measures that GTx may take may not be sufficient to enable it to meet its cash requirements, and they may negatively affect GTx's business and its ability to derive any value from its SARD program. In any event, in order to further the development of its SARD program, GTx will need to raise substantial additional capital. GTx's failure to do so would likely result in it determining to cease operations.

To the extent that GTx raises additional funds through potential collaborations, partnering or other strategic arrangements, it may be necessary to relinquish rights to some of its technologies or product candidates and intellectual property rights thereof, or grant licenses on terms that are not favorable to it, any of which could result in GTx's stockholders having little or no continuing interest in its SARD program and/or SARM assets as stockholders or otherwise. To the extent GTx raises additional funds by issuing equity securities, GTx's stockholders may experience significant dilution, particularly given its currently-depressed stock price, and debt financing, if available, may involve restrictive covenants. For example, GTx completed substantially dilutive private placements of its common stock and warrants in March 2014, November 2014 and September 2017, in addition to a registered direct offering of its common stock that it completed in October 2016 and the sale of GTx's common stock pursuant to the ATM Sales Agreement. GTx's stockholders will experience additional, perhaps substantial, dilution should GTx again raise additional funds by issuing equity securities. Any additional debt or equity financing that GTx raises may contain terms that are not favorable to it or its stockholders. GTx's ability to raise additional funds and the terms upon which it is able to raise such funds have been severely harmed by the failure of the ASTRID trial to meet its primary endpoint and the resulting significant uncertainty regarding GTx's prospects to continue as a going concern. If GTx is unable to complete the merger, its ability to raise additional funds and the terms upon which it is able to raise such funds may also be adversely affected by the uncertainties regarding its financial condition, uncertainties with respect to the prospects for its early-stage SARD program, the sufficiency of its capital resources, potential future management turnover, and volatility and instability in the global financial markets. As a result of these and other factors, there is no guarantee that sufficient additional funding will be available to GTx on acceptable terms, or at all.

GTx is substantially dependent on its remaining employees to facilitate the consummation of the merger.

GTx has substantially reduced its workforce since November 2018 and as of March 31, 2019, it had only 13 full-time employees. GTx's ability to successfully complete the merger depends in large part on its ability to retain its remaining personnel. Despite GTx's efforts to retain these employees, one or more may terminate their employment with GTx on short notice. The loss of the services of any of these employees could potentially harm GTx's ability to consummate the merger, to run its day-to-day business operations, as well as to fulfill its reporting obligations as a public company.

The pendency of the merger could have an adverse effect on the trading price of GTx's common stock and its business, financial condition and prospects.

While there have been no significant adverse effects to date, the pendency of the merger could disrupt GTx's business in many ways, including:

- the attention of its remaining management and employees may be directed toward the completion of the merger and related matters and may be diverted from GTx's day-to-day business operations; and
- third parties may seek to terminate or renegotiate their relationships with GTx as a result of the merger, whether pursuant to the terms of their existing agreements with GTx or otherwise.

Should they occur, any of these matters could adversely affect the trading price of GTx's common stock or harm its business, financial condition and prospects.

Risks Related to GTx's Development Activities

GTx was substantially dependent on the success of enobosarm, and the recent failure of the ASTRID trial to meet its primary endpoint has severely diminished enobosarm's prospects and GTx's prospects to continue as a going concern. As GTx is now focused solely on its SARD program, its failure to obtain funding for and to advance the development of its SARD program would likely require it to cease operations.

A substantial portion of GTx's recent efforts and expenditures has been devoted to, and its prospects were substantially dependent upon, the development of enobosarm for the treatment of postmenopausal women with SUI. However, in September 2018, GTx announced that the ASTRID trial failed to achieve statistical significance on the primary endpoint of a greater than 50% reduction in incontinence episodes per day compared to placebo. The failure of the ASTRID trial to achieve its primary endpoint has significantly depressed GTx's stock price and has severely harmed its ability to raise additional capital and to secure potential collaborative, partnering or other strategic arrangements for its SARM assets, and consequently, GTx's prospects to continue as a going concern have been severely diminished. Following GTx's review of the full data sets from the ASTRID trial, GTx determined to discontinue further development of enobosarm to treat SUI and to otherwise discontinue any further development of its SARM program generally. GTx continues its efforts to seek potential collaborative, partnering or other strategic arrangements for its SARM assets, including a sale or other divestiture of its SARM assets. GTx has for many years actively pursued, but has been unable to successfully enter into, potential collaborative, partnering or other strategic arrangements for its SARM assets. If GTx is unable to ultimately enter into any such arrangements for its SARM assets, it will not receive any return on its investment in enobosarm and its other SARMs.

As a result of GTx's decision to discontinue its SARM development efforts, its development activities are focused solely on completing ongoing preclinical studies in order to select the most appropriate SARD compounds to move forward into the additional preclinical studies required to submit an IND and potentially advance one of its SARD compounds into a first-in-human clinical trial. However, while GTx believes that its existing capital resources will be adequate to enable it to conduct and complete planned IND-enabling preclinical studies of its SARD compounds, GTx requires significant additional financial resources in order to initiate and complete initial human clinical trials of a SARD compound and to otherwise further the development of its SARD program. In addition, GTx's preclinical evaluation of its SARD technology is at a very early stage and is subject to the substantial risk and probability of failure inherent in the development of early-stage programs.

In any event, if the merger is not completed and GTx is unable to raise sufficient additional funds for the development of its SARD program, whether through potential collaborative, partnering or other strategic arrangements or otherwise, or if GTx otherwise determines to discontinue the development of its SARD program, GTx will likely determine to cease operations.

GTx and any potential collaborators will not be able to commercialize any SARD or SARM product candidates if its preclinical studies do not produce successful results or if GTx or its SARD or SARM clinical trials do not adequately demonstrate safety and efficacy in humans.

Significant additional clinical development, financial resources and personnel would be required to obtain necessary regulatory approvals for any potential future SARD or SARM product candidates and to develop them into commercially viable products. Preclinical and clinical testing is expensive, can take many years to complete and has an uncertain outcome. Success in preclinical testing and early clinical trials does not ensure that later clinical trials will be successful, and top-line or interim results of a clinical trial do not necessarily predict final results. In this regard, from time to time, GTx has and may in the future publish or report top-line, interim or other preliminary data from its clinical trials, which data is based on a preliminary analysis of then-available efficacy and safety data, and the results and related findings and conclusions are subject to change following a more comprehensive review of the data related to the particular study or trial. GTx also makes assumptions, estimations, calculations and conclusions as part of its analyses of data, and it may not have received or had the opportunity to fully and carefully evaluate all data from the applicable trial. As a result, the top-line results that GTx reports may differ from future results of the same studies, or different conclusions or considerations may qualify such results, once additional data have been received and fully evaluated. Similarly, interim or other preliminary data from clinical trials that GTx may conduct may not be indicative of the final results of the trial and are subject to the risk that one or more of the clinical outcomes may materially change as patient enrollment continues and more patient data become available. Top-line, interim and other preliminary data also remain subject to audit and verification procedures that may result in the final data being materially different from such top-line, interim or other preliminary data GTx previously published. As a result, top-line, interim or preliminary data should be viewed with caution until the final data are available.

Typically, the failure rate for development candidates is high. If a product candidate fails at any stage of development, GTx will not have the anticipated revenues from that product candidate to fund its operations, and GTx will not receive any return on its investment in that product candidate. For example, in September 2018, GTx announced that the ASTRID trial failed to achieve statistical significance on the primary endpoint of the proportion of patients with a greater than 50% reduction in incontinence episodes per day compared to placebo. The failure of the ASTRID trial to achieve its primary endpoint has significantly depressed its stock price and has severely harmed GTx's ability to raise additional capital and to secure potential collaborative, partnering or other strategic arrangements for its SARM assets, and consequently, GTx's prospects to continue as a going concern have been severely diminished. Likewise, during the third quarter of 2017, GTx determined that there were insufficient patients achieving clinical benefit from enobosarm treatment to continue its Phase 2 proof-of-concept clinical trial evaluating enobosarm in patients with advanced AR positive triple-negative breast cancer. Additionally, in the third quarter of 2017, GTx decided not to pursue additional clinical development of enobosarm to treat women with ER positive, AR positive advanced breast cancer after evaluating the breast cancer environment where the treatment paradigms are shifting to immunotherapies and/or combination therapies, along with the time and cost of conducting the necessary clinical trials for potential approval, even though GTx announced that its Phase 2 clinical trial of enobosarm in this indication achieved its primary endpoint in both the 9 mg and 18 mg cohorts of the clinical trial. Following GTx's review of the full data sets from the ASTRID trial, GTx determined to discontinue further development of enobosarm to treat SUI and to otherwise discontinue any further development of its SARM program generally. GTx continues its efforts to seek potential collaborative, partnering or other strategic arrangements for its SARM assets, including a sale or other divestiture of its SARM assets. GTx has for many years actively pursued, but has been unable to successfully enter into, potential collaborative, partnering or other strategic arrangements for its SARM assets. If GTx is unable to ultimately enter into any such arrangements for its SARM assets, GTx will not receive any return on its investment in enobosarm and its other SARMs.

In the first quarter of 2015, GTx entered into an exclusive worldwide license agreement with UTRF to develop its proprietary SARD technology and GTx is currently focused solely on the further development of its SARD program. GTx's preclinical evaluation of its SARD technology is at an early stage and is subject to the

substantial risk and probability of failure inherent in the development of early-stage programs. While GTx believes that its existing capital resources will be adequate to enable it to conduct and complete planned IND-enabling preclinical studies of its SARD compounds, GTx will require significant additional financial resources in order to initiate and complete initial human clinical trials of a SARD compound and to otherwise further the development of its SARD program. If GTx's research and preclinical development of its SARD program is unsuccessful, is discontinued and/or GTx is not able to obtain sufficient funding to advance the development of its SARD program, GTx will likely cease operations.

Significant delays in preclinical and clinical testing could materially impact GTx's product development costs. GTx does not know whether its planned preclinical and potential future clinical trials will need to be modified or will be completed on schedule, if at all. GTx or any potential collaborators may experience numerous unforeseen and/or adverse events during, or as a result of, preclinical testing and the clinical trial process that could delay or prevent GTx or its potential collaborators' ability to commercialize any product candidates, including:

- regulators or institutional review boards may not authorize GTx or any potential collaborators to commence a clinical trial or conduct a clinical trial at a prospective trial site, or GTx or any potential collaborators may experience substantial delays in obtaining these authorizations;
- GTx or any potential collaborators may be delayed in reaching, or may fail to reach, agreement on acceptable terms with prospective clinical research organizations, or CROs, and clinical trial sites, the terms of which can be subject to extensive negotiation and may vary significantly among different CROs and trial sites;
- preclinical or clinical trials may produce negative or inconclusive results, which may require GTx or any potential collaborators to conduct additional preclinical or clinical testing or to abandon projects that GTx expects to be promising;
- even if preclinical or clinical trial results are positive, the United States Food and Drug Administration (the "FDA"), or foreign regulatory authorities could nonetheless require GTx to conduct unanticipated additional preclinical development or clinical trials;
- patient registration or enrollment in clinical trials may be slower than GTx anticipates resulting in significant delays, additional costs and/or study terminations;
- GTx or any potential collaborators may suspend or terminate clinical trials if the participating patients are being exposed to unacceptable health risks;
- regulators or institutional review boards may suspend or terminate clinical research for various reasons, including noncompliance with regulatory requirements;
- GTx's product candidates may not have the desired effects or may include undesirable side effects; and
- changes in regulatory requirements, policies and guidelines.

If any of these events were to occur in the future and, as a result, GTx or any potential collaborators have significant delays in or termination of potential future clinical trials, GTx's costs could increase and its ability to generate revenue could be impaired, which would materially and adversely impact its business, financial condition and growth prospects.

If GTx or any potential collaborators observe serious or other adverse events during the time any potential future product candidates are in development or after GTx's products are approved and on the market, GTx or any potential collaborators may be required to perform lengthy additional clinical trials, may be required to cease further development of such product candidates, may be denied regulatory approval of such products, may be forced to change the labeling of such products or may be required to withdraw any such products from the market, any of which would hinder or preclude GTx's ability to generate revenues.

In GTx's Phase 2 clinical trials for enobosarm for the treatment of muscle wasting in patients with cancer and healthy older males and postmenopausal females, GTx observed mild elevations of hepatic enzymes, which in

certain circumstances may lead to liver failure, in a few patients in both the placebo and enobosarm treated groups. Reductions in high-density lipoproteins ("HDL"), have also been observed in subjects treated with enobosarm. Lower levels of HDL could lead to increased risk of adverse cardiovascular events. Mild transient elevations in liver enzymes that were within normal limits were observed in GTx's Phase 2 proof-of-concept clinical trial of enobosarm to treat postmenopausal women with SUI, except for one patient with levels greater than 1.5 times the upper limit of normal which returned to normal following her 12-week treatment period. Reductions in total cholesterol, low-density lipoproteins ("LDL"), HDL and triglycerides were also observed. Results of the ASTRID trial in postmenopausal women with SUI indicated that enobosarm was generally safe and well tolerated, and reported adverse events were generally mild to moderate in intensity and similar across all treatment groups. Mild transient elevations in hepatic enzymes and changes in lipid profile were dose dependent, and consistent with results seen in previous trials. In addition, in GTx's Phase 2 proof-of-concept clinical trial evaluating enobosarm in a 9 mg daily dose for the treatment of patients with ER positive and AR positive metastatic breast cancer, bone pain of the chest cage, a serious adverse event ("SAE"), was assessed as possibly related to enobosarm. Although doses up to 30 mg have been evaluated in short duration studies, the 3 mg dose that was the subject of the ASTRID trial and higher enobosarm doses that may potentially be tested by potential future collaborators in later stage longer duration trials, if any, may increase the risk or incidence of known potential side effects of SARMs, including elevations in hepatic enzymes and further reductions in HDL, in addition to the emergence of side effects that have not been seen to date.

If the incidence of serious or other adverse events related to enobosarm or any other SARD or SARM product candidates increases in number or severity, if a regulatory authority believes that these or other events constitute an adverse effect caused by the drug, or if other effects are identified during clinical trials that GTx or any potential collaborators may conduct in the future or after any potential future product candidates are approved and marketed:

- GTx or any potential collaborators may be required to conduct additional preclinical or clinical trials, make changes in the labeling of any such approved products, reformulate any such products, or implement changes to or obtain new approvals of its contractors' manufacturing facilities;
- regulatory authorities may be unwilling to approve GTx's product candidates or may withdraw approval of its products;
- GTx may experience a significant drop in the sales of the affected products;
- GTx's reputation in the marketplace may suffer; and
- GTx may become the target of lawsuits, including class action suits.

Any of these events could prevent approval or harm adoption and sales of the affected product candidates or products, or could substantially increase the costs and expenses of commercializing and marketing any such products.

Risks Related to GTx's Dependence on Third Parties

If the merger is not completed and GTx does not establish collaborative, partnering or other strategic arrangements for its SARD program and SARM assets or otherwise raise substantial additional capital, GTx will likely determine to cease operations.

GTx's current strategy is dependent on its ability to secure potential collaborative, partnering or other strategic arrangements with other pharmaceutical and biotechnology companies to assist GTx in furthering development and potential commercialization of any SARD and SARM product candidates, and to otherwise obtain funding for such activities. For example, GTx is currently focused solely on the further development of its SARD program and while GTx believes that its existing capital resources will be adequate to enable it to conduct and complete planned IND-enabling preclinical studies of SARD compounds, GTx will require significant additional financial resources in order to initiate and complete initial human clinical trials and to otherwise further the

development of GTx's SARD program. Accordingly, if, for any reason, the merger is not consummated, GTx may resume its efforts to seek additional funds through potential collaborative, partnering or other strategic arrangements to provide it with the necessary resources for the development of its SARD program. GTx faces significant competition in seeking such arrangements, and such arrangements are complex and time consuming to negotiate and document. In any event, GTx may not be successful in entering into new collaborative, partnering or other strategic arrangements with third parties for the further development of its SARD program (or GTx's SARD assets) on acceptable terms, or at all. In this regard, GTx has for many years actively pursued, but has been unable to successfully enter into, potential collaborative, partnering or other strategic arrangements for its SARM assets and GTx likewise has not been successful to date in entering into potential collaborative, partnering or other strategic arrangements for its SARD program. In addition, GTx is unable to predict when, if ever, it will enter into any potential collaborative, partnering or other such strategic arrangements because of the numerous risks and uncertainties associated with establishing such arrangements, and GTx has otherwise been unsuccessful, for many years, in its efforts to establish such arrangements. In any event, if the merger is not completed and GTx is unable to raise sufficient additional funds for the development of its SARD program, whether through potential collaborative, partnering or other strategic arrangements or otherwise, or if GTx otherwise determines to discontinue the development of GTx's SARD program, it will likely determine to cease operations. In addition, because GTx has discontinued its SARM development efforts, if it is unable to ultimately enter into any potential collaborative, partnering or other such strategic arrangements for its SARM assets, GTx will not receive any return on its investment in enobosarm and its other SARMs.

Any collaborative arrangements that GTx establishes in the future may not be successful or GTx may otherwise not realize the anticipated benefits from these collaborations. In addition, any future collaborative arrangements may place the development and commercialization of GTx's product candidates outside its control, may require GTx to relinquish important rights or may otherwise be on terms unfavorable to GTx.

GTx has in the past established, and, if the merger is not completed, GTx intends to continue to seek to establish, partnering, collaborative and similar strategic arrangements with third parties to develop and commercialize any potential future product candidates, and these collaborations may not be successful or GTx may otherwise not realize the anticipated benefits from these collaborations. For example, in March 2011, GTx and Ipsen Biopharm Limited, or Ipsen, mutually agreed to terminate the collaboration for the development and commercialization of GTx's toremifene-based product candidate. As of the date of this report, GTx has no ongoing collaborations for the development and commercialization of any product candidate. GTx may not be able to locate third-party collaborators to develop and market any product candidates, and GTx lacks the necessary financial resources to develop any product candidates alone.

Dependence on collaborative arrangements subjects GTx to a number of risks, including:

- GTx may not be able to control the amount and timing of resources that its potential collaborators may devote to GTx's product candidates;
- potential collaborations may experience financial difficulties or changes in business focus;
- GTx may be required to relinquish important rights such as marketing and distribution rights;
- should a collaborator fail to develop or commercialize one of GTx's compounds or product candidates, GTx may not receive any future milestone payments and will not receive any royalties for the compound or product candidate;
- business combinations or significant changes in a collaborator's business strategy may also adversely affect a collaborator's willingness or ability to complete its obligations under any arrangement;
- under certain circumstances, a collaborator could move forward with a competing product candidate developed either independently or in collaboration with others, including GTx's competitors; and
- collaborative arrangements are often terminated or allowed to expire, which could delay the development and may increase the cost of developing GTx's product candidates.

If third parties do not manufacture GTx's clinical and commercial drug supplies in sufficient quantities, in the required timeframe, at an acceptable cost, and with appropriate quality control, clinical development and commercialization of any potential future product candidates would be delayed.

GTx does not currently own or operate manufacturing facilities, and it relies, and expects to continue to rely, on third parties for the production of clinical and commercial quantities of any product candidates. GTx's current and anticipated future dependence upon others for the manufacture of its product candidates may adversely affect GTx's future profit margins, if any, and GTx's ability to develop product candidates and commercialize any product candidates on a timely and competitive basis.

GTx relies and expects to continue to rely on third-party vendors for drug substance and drug product manufacturing, including drug substance for SARDs used in its current and potential future preclinical studies. If the contract manufacturers that GTx is currently utilizing to meet its supply needs for SARD compounds or any potential future SARD product candidates prove incapable or unwilling to continue to meet its supply needs, GTx could experience a delay in conducting any additional preclinical or clinical trials of SARD compounds or any potential future SARD product candidates. GTx may not be able to maintain or renew its existing or any other third-party manufacturing arrangements on acceptable terms, if at all. If GTx's suppliers fail to meet its requirements for its product candidates for any reason, GTx would be required to obtain alternate suppliers. Any inability to obtain alternate suppliers, including an inability to obtain approval from the FDA of an alternate supplier, would delay or prevent the clinical development and commercialization of any potential future product candidates.

Use of third-party manufacturers may increase the risk that GTx will not have adequate drug supplies for preclinical, clinical and commercial use.

Reliance on third-party manufacturers entails risks, to which GTx would not be subject if GTx manufactured its product candidates itself, including:

- reliance on the third-party for regulatory compliance and quality assurance;
- the possible breach of the manufacturing agreement by the third-party because of factors beyond GTx's control;
- the possible termination or non-renewal of the agreement by the third-party, based on its own business priorities, at a time that is costly or inconvenient for GTx; and
- drug product supplies not meeting the requisite requirements for clinical trial use.

If GTx is not able to obtain adequate drug supplies, including SARD compounds, it will be more difficult for GTx to develop any product candidates and compete effectively. GTx's potential future product candidates and any products that GTx and/or its potential collaborators may develop may compete with other product candidates and products for access to manufacturing facilities.

GTx's present or future manufacturing partners may not be able to comply with FDA-mandated current Good Manufacturing Practice regulations, other FDA regulatory requirements or similar regulatory requirements outside the United States. Failure of GTx's third-party manufacturers or GTx to comply with applicable regulations could result in sanctions being imposed on GTx, including fines, injunctions, civil penalties, failure of regulatory authorities to grant marketing approval of its product candidates, delays, suspension or withdrawal of approvals, license revocation, seizures or recalls of product candidates or products, operating restrictions and criminal prosecutions, any of which could significantly and adversely affect supplies of GTx's product candidates.

If third parties on whom GTx rely do not perform as contractually required or expected, GTx may not be able to obtain regulatory approval for or successfully commercialize any potential future product candidates.

GTx does not have the ability to independently conduct clinical trials for its product candidates, and GTx must rely on third parties, such as CROs, medical institutions, clinical investigators and contract laboratories to conduct its clinical trials. In addition, GTx relies on third parties to assist with its preclinical development of product candidates. If these third parties do not successfully carry out their contractual duties or regulatory obligations or meet expected deadlines, if the third parties need to be replaced, or if the quality or accuracy of the data they obtain is compromised due to the failure to adhere to GTx's clinical protocols or regulatory requirements or for other reasons, GTx's preclinical development activities or clinical trials may be extended, delayed, suspended or terminated, and GTx may not be able to obtain regulatory approval for or successfully commercialize any potential future product candidates.

Risks Related to GTx's Intellectual Property

If GTx loses its licenses from UTRF, GTx may be unable to continue its business and, if the merger is completed, the CVR holders may not receive any proceeds from GTx's SARD or SARM technology.

GTx has licensed intellectual property rights and technology from UTRF used in substantially all of its business. GTx's license agreements with UTRF, under which GTx was granted rights to enobosarm and other SARM compounds, and to SARD compounds and, for both, to methods of use thereof, may be terminated by UTRF if GTx is in breach of its obligations under, or fails to perform any terms of, the relevant agreement and fails to cure that breach. If one or both of these agreements are terminated, then GTx may lose its rights to utilize enobosarm and other SARM compounds and/or SARD compounds and the intellectual property covered by those agreements to market, distribute and sell licensed products, which may prevent GTx from continuing its business and would likely cause GTx to cease operations altogether.

In addition, if the merger is completed and the combined company breaches its obligations under one or both license agreements, resulting in a termination of the relevant agreement, then the combined company may not be able to develop the SARD compounds or divest the SARM assets. As a result, the combined company may not receive proceeds from the transfer of rights to the applicable technologies or the sale of SARD compounds. If the combined company does not receive any such proceeds, then the CVR holders would not receive any payments on the CVRs.

If some or all of GTx's or GTx's licensor's patents expire or are invalidated or are found to be unenforceable, or if some or all of GTx's patent applications do not result in issued patents or result in patents with narrow, overbroad, or unenforceable claims, or claims that are not supported in regard to written description or enablement by the specification, or if GTx is prevented from asserting that the claims of an issued patent cover a product of a third-party, GTx may be subject to competition from third parties with products in the same class of products as GTx's product candidates or products with the same active pharmaceutical ingredients as GTx's product candidates, including in those jurisdictions in which GTx has no patent protection.

GTx's commercial success, if any, will depend in part on obtaining and maintaining patent and trade secret protection for any product candidates that it may develop, as well as the methods for treating patients in the product indications using these product candidates. GTx will be able to protect any potential future product candidates and the methods for treating patients in the product indications using these product candidates from unauthorized use by third parties only to the extent that GTx or its exclusive licensor owns or controls such valid and enforceable patents or trade secrets.

Even if any potential future product candidates and/or the methods for treating patients for prescribed indications using these product candidates are covered by valid and enforceable patents and have claims with sufficient scope, disclosure and support in the specification, the patents will provide protection only for a limited amount of time. GTx's and GTx's licensor's ability to obtain patents can be highly uncertain and involve complex and in

some cases unsettled legal issues and factual questions. Furthermore, different countries have different procedures for obtaining patents, and patents issued in different countries provide different degrees of protection against the use of a patented invention by others. Therefore, if the issuance to GTx or GTx's licensor, in a given country, of a patent covering an invention is not followed by the issuance, in other countries, of patents covering the same invention, or if any judicial interpretation of the validity, enforceability, or scope of the claims in, or the written description or enablement in, a patent issued in one country is not similar to the interpretation given to the corresponding patent issued in another country, GTx's ability to protect its intellectual property in those countries may be limited. Changes in either patent laws or in interpretations of patent laws in the United States and other countries may materially diminish the value of GTx's intellectual property or narrow the scope of its patent protection.

GTx may be subject to competition from third parties with products in the same class of products as its product candidates or products with the same active pharmaceutical ingredients as GTx's product candidates in those jurisdictions in which GTx has no patent protection. Even if patents are issued to GTx or its licensor regarding its product candidates or methods of using them, those patents can be challenged by GTx's competitors who can argue such patents are invalid or unenforceable, lack of utility, lack sufficient written description or enablement, or that the claims of the issued patents should be limited or narrowly construed. Patents also will not protect GTx's product candidates if competitors devise ways of making or using these product candidates without legally infringing GTx's patents. The Federal Food, Drug, and Cosmetic Act and FDA regulations and policies create a regulatory environment that encourages companies to challenge branded drug patents or to create non-infringing versions of a patented product in order to facilitate the approval of abbreviated new drug applications for generic substitutes. These same types of incentives encourage competitors to submit new drug applications that rely on literature and clinical data not prepared for or by the drug sponsor, providing another less burdensome pathway to approval.

GTx also relies on trade secrets to protect its technology, especially where GTx does not believe that patent protection is appropriate or obtainable. However, trade secrets are difficult to protect. GTx's employees, consultants, contractors, outside scientific collaborators and other advisors may unintentionally or willfully disclose GTx's confidential information to competitors, and confidentiality agreements may not provide an adequate remedy in the event of unauthorized disclosure of confidential information. Enforcing a claim that a third-party illegally obtained and is using its trade secrets is expensive and time-consuming, and the outcome is unpredictable. Moreover, GTx's competitors may independently develop equivalent knowledge, methods and know-how. Failure to obtain or maintain trade secret protection could adversely affect GTx's competitive business position.

If GTx infringes intellectual property rights of third parties, it may increase GTx's costs or prevent it from being able to commercialize its product candidates.

There is a risk that GTx is infringing the proprietary rights of third parties because numerous United States and foreign issued patents and pending patent applications, which are owned by third parties, exist in the fields that are the focus of GTx's development and manufacturing efforts. Others might have been the first to make the inventions covered by each of GTx's or its licensor's pending patent applications and issued patents and/or might have been the first to file patent applications for these inventions. In addition, because patent applications take many months to publish and patent applications can take many years to issue, there may be currently pending applications, unknown to GTx or its licensor, which may later result in issued patents that cover the production, manufacture, synthesis, commercialization, formulation or use of GTx's product candidates. In addition, the production, manufacture, synthesis, commercialization, formulation or use of GTx's product candidates may infringe existing patents of which GTx is not aware. Defending itself against third-party claims, including litigation in particular, would be costly and time consuming and would divert management's attention from GTx's business, which could lead to delays in its development or commercialization efforts. If third parties are successful in their claims, GTx might have to pay substantial damages or take other actions that are adverse to its business.

As a result of intellectual property infringement claims, or to avoid potential claims, GTx might:

- be prohibited from selling or licensing any product that GTx and/or any potential collaborators may develop unless the patent holder licenses the patent to GTx, which the patent holder is not required to do;
- be required to pay substantial royalties or other amounts, or grant a cross license to GTx's patents to another patent holder; or
- be required to redesign the formulation of a product candidate so that it does not infringe, which may not be possible or could require substantial funds and time.

Risks Related to Regulatory Approval

If GTx or any potential collaborators are not able to obtain required regulatory approvals, GTx or such collaborators will not be able to commercialize its product candidates, and GTx's ability to generate revenue will be materially impaired.

The activities associated with the development and commercialization of product candidates are subject to comprehensive regulation by the FDA, other regulatory agencies in the United States and by comparable authorities in other countries, including the European Medicines Agency ("EMA"). Failure to obtain regulatory approval for a product candidate will prevent GTx or any potential collaborator from commercializing the product candidate. GTx has not received regulatory approval to market any product candidate in any jurisdiction, and it does not expect to obtain FDA, EMA or any other regulatory approvals to market any potential future product candidates for the foreseeable future, if at all. The process of obtaining regulatory approvals is expensive, often takes many years, if approval is obtained at all, and can vary substantially based upon the type, complexity and novelty of the product candidates involved.

Changes in the regulatory approval policy during the development period, changes in or the enactment of additional regulations or statutes, or changes in regulatory review for each submitted product application may cause delays in the approval or rejection of an application. Even if the FDA or the EMA approves a product candidate, the approval may impose significant restrictions on the indicated uses, conditions for use, labeling, advertising, promotion, marketing and/or production of such product, and may impose ongoing requirements for post-approval studies, including additional research and development and clinical trials. Any FDA approval may also impose Risk Evaluation Mitigation Strategy, or REMS, on a product if the FDA believes there is a reason to monitor the safety of the drug in the market place. REMS may include requirements for additional training for health care professionals, safety communication efforts and limits on channels of distribution, among other things. The sponsor would be required to evaluate and monitor the various REMS activities and adjust them if need be. The FDA and EMA also may impose various civil or criminal sanctions for failure to comply with regulatory requirements, including withdrawal of product approval.

Furthermore, the approval procedure and the time required to obtain approval varies among countries and can involve additional testing beyond that required by the FDA. Approval by one regulatory authority does not ensure approval by regulatory authorities in other jurisdictions. Failure to obtain approval in one jurisdiction may negatively impact GTx's ability to obtain approval elsewhere.

The FDA, the EMA and other foreign regulatory authorities have substantial discretion in the approval process and may refuse to accept any application or may decide that GTx's data is insufficient for approval and require additional preclinical, clinical or other studies, including Phase 4 clinical studies. For example, in October 2009, GTx received a Complete Response Letter from the FDA regarding its new drug application, or NDA, for toremifene 80 mg to reduce fractures in men with prostate cancer on androgen deprivation therapy notifying GTx that the FDA would not approve its NDA as a result of certain clinical deficiencies identified in the Complete Response Letter. GTx has since discontinued its toremifene 80 mg development program, as well as other toremifene-based products. Although GTx evaluated the potential submission of a marketing authorization

application (“MAA”), to the EMA seeking marketing approval of enobosarm 3 mg in the European Union, or EU, for the prevention and treatment of muscle wasting in patients with advanced NSCLC, based on input from the Medicines and Healthcare Products Regulatory Agency (“MHRA”), GTx determined that the data from the POWER trials was not sufficient to support the filing and approval of a MAA without confirmatory data from another Phase 3 clinical trial of enobosarm 3 mg. As a result of this input, GTx elected not to submit a MAA in the absence of such confirmatory data. In addition, since data from the two POWER trials failed to meet the primary statistical criterion pre-specified for the co-primary endpoints of lean body mass and physical function, GTx was unable to file with the FDA a NDA for enobosarm 3 mg for the prevention and treatment of muscle wasting in patients with advanced NSCLC.

In addition, varying interpretations of the data obtained from preclinical and clinical testing could delay, limit, or prevent regulatory approval of a product candidate. Even if GTx submits an application to the FDA, the EMA and other foreign regulatory authorities for marketing approval of a product candidate, it may not result in any marketing approvals.

GTx does not expect to receive regulatory approval for the commercial sale of any product candidates for the foreseeable future, if at all. The inability to obtain approval from the FDA, the EMA and other foreign regulatory authorities for its product candidates would prevent GTx or any potential collaborators from commercializing these product candidates in the United States, the EU, or other countries. See the section entitled “GTx Business—Government Regulation” of this proxy statement/prospectus/information statement for additional information regarding risks associated with marketing approval, as well as risks related to potential post-approval requirements.

Risks Related to Commercialization

The commercial success of any products that GTx and/or any potential collaborators may develop and for which GTx may obtain regulatory approval will depend upon the market and the degree of market acceptance among physicians, patients, health care payors and the medical community.

Any products that GTx and/or any potential collaborators may develop may not gain market acceptance for its stated indication among physicians, patients, health care payors and the medical community despite regulatory approval. If these products do not achieve an adequate level of acceptance, GTx may not generate material product revenues or receive royalties to the extent GTx currently anticipates, and GTx may not become profitable. The degree of market acceptance of its product candidates, if approved for commercial sale, will depend on a number of factors, including:

- efficacy and safety results in clinical trials;
- the prevalence and severity of any side effects;
- potential advantages over alternative treatments;
- whether the products GTx commercializes become and/or remain a preferred course of treatment;
- the ability to offer GTx’s product candidates for sale at competitive prices;
- relative convenience and ease of administration compared to alternative treatment;
- the strength of marketing and distribution support; and
- sufficient third-party coverage or reimbursement.

If GTx is unable to establish sales and marketing capabilities or establish and maintain agreements with third parties to market and sell its product candidates, GTx may be unable to generate product revenue from such candidates.

GTx has limited experience as a company in the sales, marketing and distribution of pharmaceutical products. In the event one of GTx’s potential future product candidates is approved, GTx will need to establish sales and

marketing capabilities or establish and maintain agreements with third parties to market and sell any such product candidates. Either of these options would be expensive and time-consuming. GTx may be unable to build its own sales and marketing capabilities, and there are risks involved with entering into arrangements with third parties to perform these services, which could delay the commercialization of any of its product candidates if approved for commercial sale. In addition, to the extent that GTx enters into arrangements with third parties to perform sales, marketing and distribution services, its product revenues are likely to be lower than if GTx markets and sells any products that it develop itself.

If GTx and/or any potential collaborators are unable to obtain reimbursement or experience a reduction in reimbursement from third-party payors for products GTx sells, its revenues and prospects for profitability will suffer.

Sales of products developed by GTx and/or any potential collaborators are dependent on the availability and extent of reimbursement from third-party payors, both governmental and private. Changes in the coverage and/or reimbursement policies of these third-party payors that reduce reimbursements for any products that GTx and/or any potential collaborators may develop and sell could negatively impact its future operating and financial results.

Medicare coverage and reimbursement of prescription drugs exists under Medicare Part D for oral drug products capable of self-administration by patients. GTx's oral drug product candidates would likely be covered by Medicare Part D (if covered by Medicare at all). In March 2010, the United States Congress enacted the Healthcare Reform Act, which, among other initiatives, implemented cost containment and other measures that could adversely affect revenues from sales of product candidates, including an increase in the drug rebates that manufacturers must pay under Medicaid for brand name prescription drugs and extension of these rebates to Medicaid managed care and a requirement that manufacturers provide a 50% discount on the negotiated price of Medicare Part D brand name drugs utilized by Medicare Part D beneficiaries during the coverage gap (the so-called "donut hole") (which discount has subsequently been increased to 70% in 2019).

The provisions of the Healthcare Reform Act have been subject to judicial and Congressional challenges, as well as efforts by the Trump administration to modify certain requirements of the Healthcare Reform Act by executive branch order. For example, on January 20, 2017, President Trump signed an Executive Order directing federal agencies with authorities and responsibilities under the Healthcare Reform Act to waive, defer, grant exemptions from, or delay the implementation of any provision of the Healthcare Reform Act that would impose a fiscal or regulatory burden on states, individuals, healthcare providers, health insurers, or manufacturers of pharmaceuticals or medical devices. On October 12, 2017, President Trump signed another Executive Order directing certain federal agencies to propose regulations or guidelines to provide small businesses with greater opportunities to form association health plans, expand the availability of short-term, limited duration insurance, and allow employees to make use of certain employer-paid health benefits, called health reimbursement arrangements, to pay for health insurance that does not meet all Healthcare Reform Act requirements. In addition, citing legal guidance from the U.S. Department of Justice, the U.S. Department of Health and Human Services ("HHS"), concluded that cost-sharing reduction, or CSR, payments to insurance companies required under the Healthcare Reform Act had not received necessary appropriations from Congress. President Trump subsequently discontinued these payments. The loss of the CSR payments is expected to increase premiums on certain policies issued by qualified health plans under the Healthcare Reform Act. Certain administrative actions have been subject to judicial challenge. In Congress, there have been a number of legislative initiatives to modify, repeal and/or replace portions of the Healthcare Reform Act. Tax reform legislation enacted at the end of 2017 eliminated the tax penalty for individuals who do not maintain sufficient health insurance coverage beginning in 2019. The Bipartisan Budget Act of 2018 contained various provisions that affect coverage and reimbursement of drugs, including an increase in the discount that manufacturers of Medicare Part D brand name drugs must provide to Medicare Part D beneficiaries during the coverage gap from 50% to 70% starting in 2019. Congress may consider other legislation to modify, repeal and/or replace certain elements of the Healthcare Reform Act. In December 2018, a federal district court judge, in a challenge brought by a number of state

attorneys general, found the Healthcare Reform Act unconstitutional in its entirety because, once Congress repealed the individual mandate provision, there was no longer a basis to rely on Congressional taxing authority to support enactment of the law. Pending appeals, which could take some time, the Healthcare Reform Act is still operational in all respects. GTx continues to evaluate the effect that the Healthcare Reform Act and its possible repeal, replacement or modification may have on GTx's business. Such legislation and other healthcare reform measures that may be adopted in the future could have a material adverse effect on GTx's industry generally and on its ability to successfully commercialize its product candidates, if approved.

Economic pressure on state budgets may result in states increasingly seeking to achieve budget savings through mechanisms that limit coverage or payment for drugs. State Medicaid programs are increasingly requesting manufacturers to pay supplemental rebates and requiring prior authorization for use of drugs where supplemental rebates are not provided. Private health insurers and managed care plans are likely to continue challenging the prices charged for medical products and services, and many of these third-party payors may limit reimbursement for newly-approved health care products. In particular, third-party payors may limit the indications for which they will reimburse patients who use any products that GTx and/or any potential collaborators may develop or sell. These cost-control initiatives could decrease the price GTx might establish for products that it or any potential collaborators may develop or sell, which would result in lower product revenues or royalties payable to GTx.

Similar cost containment initiatives exist in countries outside of the United States, particularly in the countries of the EU, where the pricing of prescription pharmaceuticals is subject to governmental control. In these countries, pricing negotiations with governmental authorities can extend well beyond the receipt of regulatory marketing approval for a product and may require GTx or any potential collaborators to conduct a clinical trial that compares the cost effectiveness of GTx's product candidates or products to other available therapies. The conduct of such a clinical trial could be expensive and result in delays in GTx's or a potential collaborators' commercialization efforts. Third-party payors are challenging the prices charged for medical products and services, and many third-party payors limit reimbursement for newly-approved health care products. Recently budgetary pressures in many EU countries are also causing governments to consider or implement various cost-containment measures, such as price freezes, increased price cuts and rebates. If budget pressures continue, governments may implement additional cost containment measures. Cost-control initiatives could decrease the price GTx might establish for products that GTx or any potential collaborators may develop or sell, which would result in lower product revenues or royalties payable to it.

Another development that could affect the pricing of drugs would be if the Secretary of HHS allowed drug reimportation into the United States. The Medicare Prescription Drug, Improvement and Modernization Act of 2003 gives discretion to the Secretary of Health and Human Services to allow drug reimportation into the United States under some circumstances from foreign countries, including from countries where the drugs are sold at a lower price than in the United States. If the circumstances were met and the Secretary exercised the discretion to allow for the direct reimportation of drugs, it could decrease the price GTx or any potential collaborators receive for any products that GTx and/or any potential collaborators may develop, negatively affecting GTx's revenues and prospects for profitability.

Health care reform measures could hinder or prevent GTx's product candidates' commercial success.

Among policy makers and payors in the United States and elsewhere, there is significant interest in health care reform, as evidenced by the initial enactment of, as well as the efforts to repeal, replace and/or modify the Healthcare Reform Act in the United States. Federal and state legislatures within the United States and foreign governments will likely continue to consider other changes to existing health care legislation. These changes adopted by governments may adversely impact GTx's business by lowering the price of health care products in the United States and elsewhere. For example, there has been increasing administrative, legislative and enforcement interest in the United States with respect to drug pricing practices. There have been several U.S. Congressional inquiries and legislative and administrative initiatives at the federal and state levels intended to,

among other things, bring more transparency to drug pricing and modify government program reimbursement for drugs. GTx cannot predict what health care reform initiatives may be adopted in the future. Further federal, state and foreign legislative and regulatory developments are likely, and GTx expects ongoing initiatives to increase pressure on drug pricing, which could decrease the price it might establish for products that it or any potential collaborators may develop or sell, which would result in lower product revenues or royalties payable to GTx.

GTx operates in a highly regulated industry and new laws, regulations or judicial decisions, or new interpretations of existing laws, regulations or decisions, related to health care availability, method of delivery or payment for health care products and services, or sales, marketing and pricing practices could negatively impact its business, operations and financial condition.

If product liability lawsuits are brought against GTx, GTx may incur substantial liabilities and may be required to limit commercialization of any products that it may develop.

GTx faces an inherent risk of product liability exposure related to its prior commercial sales of FARESTON and the testing of its product candidates in human clinical trials, and GTx will face an even greater risk if GTx commercially sells any product that it may develop. If GTx cannot successfully defend itself against claims that its product candidates or products caused injuries, GTx will incur substantial liabilities. Regardless of merit or eventual outcome, liability claims may result in:

- decreased demand for any product candidates or products;
- injury to GTx's reputation;
- withdrawal of clinical trial participants;
- costs to defend the related litigation;
- substantial monetary awards to trial participants or patients;
- loss of revenue; and
- the inability to commercialize any products for which GTx obtains or holds marketing approvals.

GTx has product liability insurance that covers its clinical trials and any commercial products up to a $25 million annual aggregate limit. Insurance coverage is increasingly expensive. GTx may not be able to maintain insurance coverage at a reasonable cost, and GTx may not be able to obtain insurance coverage that will be adequate to satisfy any liability that may arise.

If GTx's competitors are better able to develop and market products than any products that GTx and/or any potential collaborators may develop, GTx's commercial opportunity will be reduced or eliminated.

GTx faces competition from commercial pharmaceutical and biotechnology enterprises, as well as from academic institutions, government agencies and private and public research institutions. GTx's commercial opportunities will be reduced or eliminated if its competitors develop and commercialize products that are safer, more effective, have fewer side effects or are less expensive than any products that GTx and/or any potential collaborators may develop. Competition could result in reduced sales and pricing pressure on its product candidates, if approved, which in turn would reduce GTx's ability to generate meaningful revenue and have a negative impact on its results of operations. In addition, significant delays in the development of GTx's product candidates could allow its competitors to bring products to market before GTx and impair any ability to commercialize any potential future product candidates.

Various products are currently marketed or used off-label for some of the diseases and conditions that GTx are targeting in its pipeline, and a number of companies are or may be developing new treatments. These product uses, as well as promotional efforts by competitors and/or clinical trial results of competitive products, could significantly diminish any ability to market and sell any products that GTx and/or any potential collaborators may develop.

GTx believes SARDs have the potential to provide compounds that can degrade or antagonize multiple forms of the AR thereby inhibiting tumor growth in patients with CRPC, including those patients who do not respond or are resistant to current therapies. Drugs in development having potentially similar approaches to removing the AR by degradation include Arvinas Inc.'s ARV-110, which is a chimera with an AR binding moiety on one end and an E3 ligase recruiting element on the other that has recently entered Phase 1 development for the treatment of advanced prostate cancer, and Androscience Corporation's androgen receptor degrader enhancer, ASC-J9, which is currently in development for acne and alopecia with the potential for development as a treatment for prostate cancer. Additionally, Essa Pharma Inc. recently completed a Phase 1 study with EPI-506, an AR antagonist that targets the N-terminal domain of the AR, and has plans to develop a second generation agent. C4 Therapeutics, Inc. is developing degronimids as means to degrade the AR through the ligand binding domain associated degradation. CellCentric is developing therapies that target the histone methyltransferase enzyme to lower AR levels, and recently initiated a clinical trial with CCS1477 in prostate cancer. Oric Pharmaceuticals is targeting the glucocorticoid receptor as a means to impact men that have CRPC, and has a lead candidate ORIC-101 in preclinical testing. In addition to this specific potential mechanistic competition, there are various products approved or under clinical development in the broader space of treating men with advanced prostate cancer who have metastatic CRPC which may compete with GTx's proposed initial clinical objective for its SARD compounds. Pfizer and Astellas Pharma market XTANDI® (enzalutamide), an oral androgen receptor antagonist, for the treatment of metastatic CRPC in men previously treated with docetaxel as well as those that have not yet received chemotherapy. XTANDI® received FDA approval in July 2018 for the treatment of men with non-metastatic CRPC. Zytiga®, sold by Johnson & Johnson, has been approved for the treatment of metastatic CRPC and metastatic high-risk castration-sensitive prostate cancer. Johnson & Johnson also received FDA approval for a second generation anti-androgen ERLEADA (apalutamide) for the treatment of men with non-metastatic castrate-resistant prostate cancer. Bayer HealthCare and Orion Corporation recently announced that the primary endpoint of increased metastatic free survival was met in a Phase 3 study of darolutamide (ODM-201) in men with CRPC without metastases and with a rising PSA. Another target in prostate cancer that is being pursued by several companies is bromodomain inhibition. Zenith Epigenetics, Gilead Sciences Inc., CellCentric, Incyte Corporation and GlaxoSmithKline are among the companies that are evaluating BET inhibitors in Phase 1-2 trials.

With respect to SARMs, there are other SARM product candidates in development that may compete with enobosarm and any future SARM product candidates, if approved for commercial sale. For example, Viking Therapeutic's VK5211 recently reported positive results from a Phase 2 study for patients recovering from non-elective hip fracture surgery. Radius Health Inc.'s RAD140 is currently being evaluated in a Phase 1 study in postmenopausal women with hormone-receptor positive locally advanced or metastatic breast cancer. GlaxoSmithKline is conducting a Phase 1 study to assess the effect of GSK2881078 on physical strength and function after 13 weeks of treatment in patients with chronic obstructive pulmonary disease ("COPD"), and muscle weakness. OPKO Health's OPK88004 is enrolling in a dose ranging study to improve symptoms of benign prostatic hyperplasia ("BPH") by reducing prostate size and, on the basis of data from a previous trial in 350 men, increase muscle mass and bone strength and decrease body fat.

Many of GTx's competitors have significantly greater financial resources and expertise in research and development, manufacturing, preclinical testing, conducting clinical trials, obtaining regulatory approvals and marketing approved products than GTx does. Smaller or early-stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large and established companies. These third parties compete with GTx in recruiting and retaining qualified scientific and management personnel, establishing clinical trial sites and patient registration for clinical trials, as well as in acquiring technologies and technology licenses complementary to GTx's programs or advantageous to its business.

Risks Related to Employees, Growth and Other Aspects of GTx's Operations

GTx's internal computer and information technology systems, or those of its CROs or other contractors or consultants, may fail or suffer security breaches, or could otherwise face serious disruptions, which could result in a material disruption of GTx's product development efforts and could result in significant financial, legal, regulatory, business and reputational harm to GTx.

Despite the implementation of security measures, GTx's internal computer and information technology systems and those of its CROs and other contractors and consultants are vulnerable to damage from computer viruses, unauthorized access, natural disasters, terrorism, and telecommunication and electrical failures. Such events could cause interruptions of its operations. For instance, the loss of preclinical data or data from potential future clinical trials involving its product candidates, if any, could result in delays in GTx's development and regulatory filing efforts and significantly increase its costs. In addition, while all information technology operations are inherently vulnerable to inadvertent or intentional security breaches, incidents, attacks and exposures, the size, complexity, accessibility and distributed nature of GTx's information technology systems, and the large amounts of sensitive information stored on those systems, make such systems potentially vulnerable to unintentional or malicious, internal and external attacks on GTx's technology environment. Potential vulnerabilities can be exploited from inadvertent or intentional actions of its employees, third-party vendors, business partners, or by malicious third parties. Attacks of this nature are increasing in their frequency, levels of persistence, sophistication and intensity, and are being conducted by sophisticated and organized groups and individuals with a wide range of motives (including, but not limited to, industrial espionage) and expertise, including organized criminal groups, "hacktivists," nation states and others. To the extent that any disruption or security breach or incident were to result in a loss of, or damage to, GTx's data, or inappropriate disclosure of confidential, proprietary or protected health information, GTx could be subject to significant legal, financial and regulatory exposure and suffer reputational harm, and the development of its product candidates could be delayed. In addition, security breaches and other inappropriate access events can be difficult to detect, and any delay in identifying them may lead to increased harm of the type described above. Moreover, the prevalent use of mobile devices to access confidential information increases the risk of security breaches. While GTx has implemented security measures to protect its information technology systems and infrastructure, there can be no assurance that such measures will prevent service interruptions or security breaches that could adversely affect its business. In addition, GTx's information technology and other internal infrastructure systems, including corporate firewalls, servers, leased lines and connection to the Internet, face the risk of systemic failure that could disrupt its operations. A significant disruption in the availability of its information technology and other internal infrastructure systems could cause delays in its research and development work and could otherwise adversely affect GTx's business. In addition, failure to maintain effective internal accounting controls related to security breaches and cybersecurity in general could impact GTx's ability to produce timely and accurate financial statements and subject GTx to regulatory scrutiny.

If GTx fails to keep senior management and personnel, GTx may be unable to continue its business operations.

GTx's success depends on its continued ability to retain and motivate highly qualified management and personnel. Significant competition exists for qualified personnel in the biotechnology field. GTx may incur greater costs than anticipated, or may not be successful, in retaining or motivating its existing personnel. If GTx is not able to keep senior management and personnel, its ability to continue its business operations could be impaired, and the value of stockholders' investment would be adversely impacted. All of GTx's employees are at-will employees and can terminate their employment at any time.

To conserve its cash resources, GTx has substantially reduced its workforce since November 2018 and has ceased its SARM development activities and all other operations except for day-to-day business operations, completing ongoing SARD preclinical studies and those activities necessary to complete the merger. As of March 31, 2019, GTx had only 13 full-time employees. Accordingly, GTx has been and is continuing operating with a shortage of resources and may not be able to effectively conduct its operations with this limited number of

employees. In addition, GTx's ability to successfully complete the merger depends in large part on its ability to retain its remaining personnel. Despite its efforts to retain these employees, one or more may terminate their employment with GTx on short notice. The loss of the services of any of these employees could potentially harm GTx's ability to consummate the merger, to run its day-to-day business operations, as well as to fulfill its reporting obligations as a public company.

If the merger is not completed and GTx is able to raise sufficient additional funds necessary to pursue the continued development of its SARD program, GTx will need to hire a substantial number of additional employees. Any inability to manage future growth could harm GTx's ability to develop and commercialize any potential future product candidates, increase its costs and adversely impact its ability to compete effectively.

As of March 31, 2019, GTx had only 13 full-time employees. If the merger is not completed and GTx is able to raise sufficient additional funds necessary to pursue the continued development of its SARD program, GTx will need to hire experienced personnel to continue to develop its SARD program and to develop and commercialize any potential future product candidates, and GTx will need to expand the number of its managerial, operational, financial and other employees to support that growth. Significant competition exists for qualified Future growth, if any, will impose significant added responsibilities on members of management, including the need to identify, recruit, maintain and integrate additional employees. GTx's future financial performance and its ability to develop and commercialize any potential future product candidates and to compete effectively will depend, in part, on its ability to manage any future growth effectively.

Management transition creates uncertainties and could harm GTx's business.

GTx has in the past, and may again in the future, experience significant changes in executive leadership. Changes to company strategy, which can often times occur with the appointment of new executives, can create uncertainty, may negatively impact GTx's ability to execute quickly and effectively, and may ultimately be unsuccessful. In addition, executive leadership transition periods are often difficult as the new executives gain detailed knowledge of GTx's operations, and friction can result from changes in strategy and management style. Management transition inherently causes some loss of institutional knowledge, which can negatively affect strategy and execution. Until GTx integrates new personnel, and unless they are able to succeed in their positions, GTx may be unable to successfully manage and grow its business, and its results of operations and financial condition could suffer as a result. In any event, changes in GTx's organization as a result of executive management transition may have a disruptive impact on its ability to implement its strategy and could have a material adverse effect on its business, financial condition and results of operations.

Risks Related to GTx's Common Stock

The market price of GTx's common stock has been volatile and may continue to be volatile in the future. This volatility may cause GTx's stock price and the value of stockholders' investment to decline.

The market prices for securities of biotechnology companies, including those of GTx, have been highly volatile and may continue to be so in the future. In this regard, the market price for GTx's common stock has varied between a high of $25.60 on September 13, 2018, and a low of $0.74 on December 24, 2018, in the 12-month period ended December 31, 2018. The market price of GTx's common stock is likely to continue to be volatile and subject to significant price and volume fluctuations. The following factors, in addition to other risk factors described in this section, may have a significant impact on the market price of GTx's common stock:

- GTx's ability to consummate the transactions contemplated by the Merger Agreement, including the merger;
- GTx's ability to execute on its SARD development program, including its ability to conduct and complete IND-enabling studies and potentially advance one of its SARD compounds into a first-in-human clinical trial;

- GTx's ability to raise sufficient additional funds necessary for the continued development of its SARD program, whether through potential collaborative, partnering or other strategic arrangements or otherwise;
- GTx's ability to realize any value from its SARM assets, particularly in light of its decision to discontinue the development of enobosarm and its SARM program generally;
- the terms and timing of any future collaborative, licensing or other strategic arrangements that GTx may establish;
- uncertainties created by GTx's potential future management turnover;
- GTx's inability to comply with the minimum listing requirements of the Nasdaq Stock Market LLC;
- the timing of achievement of, or failure to achieve, GTx's and any potential collaborators' clinical, regulatory and other milestones, such as the commencement of clinical development, the completion of a clinical trial or the receipt of regulatory approval;
- reports of unacceptable incidences of adverse events observed in any future clinical trials of any product candidates that GTx and/or any potential collaborators may develop;
- announcement of FDA approval or non-approval of any potential future product candidates or delays in or adverse events during the FDA review process;
- actions taken by regulatory agencies with respect to any potential future product candidates or GTx's potential future clinical trials, if any, including regulatory actions requiring or leading to a delay or stoppage of any clinical trials;
- introductions or announcements of technological innovations or new products by GTx, its potential collaborators, or its competitors, and the timing of these introductions or announcements;
- the commercial success of any product approved by the FDA or its foreign counterparts;
- market conditions for equity investments in general, or the biotechnology or pharmaceutical industries in particular;
- regulatory developments in the United States and foreign countries;
- changes in the structure or reimbursement policies of health care payment systems;
- if GTx's patents covering its products candidates expire or are invalidated or are found to be unenforceable, or if some or all of its patent applications do not result in issued patents or result in patents with narrow, overbroad, or unenforceable claims;
- competition from third parties with products in the same class of products as any potential future product candidates or products with the same active pharmaceutical ingredients as those product candidates;
- any intellectual property infringement lawsuit involving GTx;
- actual or anticipated fluctuations in GTx's results of operations;
- changes in financial estimates or recommendations by securities analysts;
- hedging or arbitrage trading activity that may develop regarding GTx's common stock;
- sales of GTx common stock and other securities by it;
- sales of GTx common stock by its executive officers, directors and significant stockholders;
- the low trading volume of GTx common stock;
- changes in accounting principles; and
- additional losses of any of GTx's key management personnel.

In addition, the stock markets in general, and the markets for biotechnology and pharmaceutical stocks in particular, have experienced significant volatility that has often been unrelated to the operating performance of particular companies. For example, negative publicity regarding drug pricing and price increases by pharmaceutical companies has negatively impacted, and may continue to negatively impact, the markets for biotechnology and pharmaceutical stocks. Likewise, as a result of significant changes in U.S. social, political, regulatory and economic conditions or in laws and policies governing foreign trade and health care spending and delivery, including the possible repeal and/or replacement of all or portions of the Healthcare Reform Act or changes in tariffs and other restrictions on free trade stemming from the Trump Administration and foreign government policies, the financial markets could experience significant volatility that could also negatively impact the markets for biotechnology and pharmaceutical stocks. These broad market fluctuations may adversely affect the trading price of GTx's common stock.

In the past, class action litigation has often been instituted against companies whose securities have experienced periods of volatility in market price. Any such litigation brought against GTx could result in substantial costs, which would hurt its financial condition and results of operations and divert management's attention and resources, which could result in delays of GTx's clinical trials or commercialization efforts.

If GTx fails to meet continued listing standards of the Nasdaq Stock Market LLC, its common stock may be delisted. Delisting could adversely affect the liquidity of GTx's common stock and the market price of its common stock could decrease, and GTx's ability to obtain sufficient additional capital to fund its operations would be substantially impaired.

GTx's common stock is currently listed on the Nasdaq Capital Market. The Nasdaq Stock Market LLC, or Nasdaq, has minimum requirements that a company must meet in order to remain listed on the Nasdaq Capital Market. These requirements include maintaining a minimum closing bid price of $1.00 per share (the "Bid Price Requirement"), and the closing bid price of GTx's common stock has in the past been well below $1.00 per share. In this regard, on December 5, 2016, GTx effected one-for-ten reverse stock split of its outstanding common stock (the "2016 Reverse Stock Split"), the primary purpose of which was to enable GTx to regain compliance with the Bid Price Requirement, which compliance was regained on December 20, 2016. However, the closing bid price of GTx's common stock has recently been well below $1.00 per share, and there can be no assurance that GTx will meet the Bid Price Requirement, or any other Nasdaq continued listing requirement, in the future. If GTx fails to meet these requirements, including the Bid Price Requirement and requirements to maintain minimum levels of stockholders' equity or market values of its common stock, Nasdaq may notify GTx that it has failed to meet the minimum listing requirements and initiate the delisting process.

In addition, GTx is required pursuant to the terms of the Merger Agreement to submit to its stockholders a proposal to approve an amendment to its restated certification of incorporate to authorize its board of directors to effect a reverse stock split of all outstanding shares of its common stock. The approval of the GTx Reverse Stock Split by the stockholders is a condition to closing, pursuant to the Merger Agreement. If this reverse stock split proposal is not approved by its stockholders, and if the parties waive this closing condition, the combined company resulting from the merger will likely not be able to obtain compliance with the minimum bid price requirement for an initial listing on the Nasdaq Capital Market and, as a consequence, Nasdaq will immediately provide the combined company with written notification that GTx's common stock will be delisted.

If GTx's common stock is delisted, GTx would expect its common stock to be traded in the over-the-counter market, which could adversely affect the liquidity of its common stock. Additionally, GTx could face significant material adverse consequences, including:

- a limited availability of market quotations for its common stock;
- a reduced amount of news and analyst coverage for GTx;
- a decreased ability to issue additional securities and a concomitant substantial impairment in GTx's ability to obtain sufficient additional capital to fund its operations and to continue as a going concern;

- reduced liquidity for its stockholders;
- potential loss of confidence by employees and potential future partners or collaborators; and
- loss of institutional investor interest and fewer business development opportunities.

GTx's executive officers, directors and largest stockholders have the ability to control all matters submitted to stockholders for approval.

Based solely on the most recent Schedules 13G and 13D filed with the SEC and reports filed with the SEC under Section 16 of the Exchange Act, GTx's executive officers, directors and holders of 5% or more of its outstanding common stock, including their affiliated or associated entities, held approximately 53.5% of GTx's outstanding common stock, and GTx's executive officers and directors alone, including their affiliated or associated entities, held approximately 30.0% of GTx's outstanding common stock as well as warrants to purchase up to an additional 3.2 million shares of common stock. As a result, these stockholders, acting together, have the ability to control all matters requiring approval by its stockholders, including the election of directors, the approval of the issuance of shares of GTx's common stock pursuant to the Merger Agreement, and the approval of potential alternative mergers or other business combination transactions. The interests of this group of stockholders may not always coincide with GTx's interests or the interests of other stockholders.

GTx's ability to use its net operating loss carryforwards and certain other tax attributes may be limited.

GTx has a significant amount of federal and state net operating loss ("NOL") carryforwards. In this regard, as of December 31, 2018, GTx had net federal operating loss carryforwards of approximately $472.1 million. The federal operating loss carryforwards originating prior to 2018 will expire from 2019 to 2037 if not utilized, and state operating loss carryforwards of approximately $411.4 million will expire from 2019 to 2038 if not utilized. GTx's ability to use its federal and state NOL carryforwards to offset potential future taxable income and related income taxes that would otherwise be due is dependent upon its generation of future taxable income before the expiration dates of the NOL carryforwards, and GTx cannot predict with certainty when, or whether, it will generate sufficient taxable income to use all of its NOL carryforwards. On December 22, 2017, President Trump signed into law U.S. federal income tax legislation, informally titled the Tax Cuts and Jobs Act (the "Tax Act"). Under the Tax Act, federal NOLs incurred in taxable years ending after December 31, 2017 may be carried forward indefinitely, but the deductibility of NOLs generated in taxable years beginning after December 31, 2017 is limited. It is uncertain if and to what extent various states will conform to the Tax Act. In addition, under Sections 382 and 383 of the Code, if a corporation undergoes an "ownership change," generally defined as a greater than 50% change (by value) in its equity ownership over a three-year period, the corporation's ability to use its pre-change NOL carryforwards and other pre-change tax attributes (such as research tax credits) to offset its post-change taxable income or taxes may be limited. GTx completed a study through December 31, 2016 to determine whether any Section 382 limitations exist and, as a result of this study and GTx's analysis of subsequent ownership changes, GTx does not believe that any Section 382 limitations exist through December 31, 2018, though GTx has not yet conducted an in-depth analysis since the last study. Section 382 of the Code is an extremely complex provision with respect to which there are many uncertainties, however and GTx has not established whether the IRS agrees with its determination. In any event, GTx's 2016 and 2017 equity offerings, its past and potential future issuances of common stock pursuant to the ATM Sales Agreement, other future equity offerings and/or changes in its stock ownership, some of which are outside of its control, could in the future result in an ownership change and an accompanying Section 382 limitation. In addition, the merger, if consummated, will constitute an ownership change (within the meaning Section 382 of the Code) which could eliminate or otherwise substantially limit GTx's federal and state NOL carryforwards. Therefore, utilization of a portion of GTx's domestic NOL and tax credit carryforwards will likely be limited in future periods and a portion of the carryforwards could expire before being available to reduce future income tax liabilities.

Anti-takeover provisions in GTx's charter documents and under Delaware law could make an acquisition of GTx, which may be beneficial to its stockholders, more difficult and may prevent attempts by its stockholders to replace or remove GTx's current management.

Provisions in GTx's certificate of incorporation and its bylaws may delay or prevent an acquisition of GTx or a change in its management. In addition, these provisions may frustrate or prevent any attempts by its stockholders to replace or remove its current management by making it more difficult for stockholders to replace members of its Board of Directors. Because the GTx Board is responsible for appointing the members of the management team, these provisions could in turn affect any attempt by GTx's stockholders to replace current members of its management team. These provisions include:

- a classified Board of Directors;
- a prohibition on actions by its stockholders by written consent;
- the ability of the GTx Board to issue preferred stock without stockholder approval, which could be used to institute a "poison pill" that would work to dilute the stock ownership of a potential hostile acquirer, effectively preventing acquisitions that have not been approved by the GTx Board; and
- limitations on the removal of directors.

Moreover, because GTx is incorporated in Delaware, it is governed by the provisions of Section 203 of the Delaware General Corporation Law, which prohibits a person who owns 15% or more of its outstanding voting stock from merging or combining with GTx for a period of three years after the date of the transaction in which the person acquired 15% or more of GTx's outstanding voting stock, unless the merger or combination is approved in a prescribed manner. Finally, these provisions establish advance notice requirements for nominations for election to the GTx Board or for proposing matters that can be acted upon at stockholder meetings. These provisions would apply even if the offer may be considered beneficial by some stockholders.

GTx's amended and restated bylaws provide that the Court of Chancery of the State of Delaware will be the exclusive forum for substantially all disputes between GTx and its stockholders, which could limit GTx's stockholders' ability to obtain a favorable judicial forum for disputes with GTx or its directors, officers or employees.

GTx's amended and restated bylaws provide that the Court of Chancery of the State of Delaware is the exclusive forum for any derivative action or proceeding brought on behalf of GTx, for any action asserting a claim of breach of a fiduciary duty owed by any current or former director, officer, other employee or stockholder of GTx to GTx or to its stockholders, for any action asserting a claim arising pursuant to any provision of the DGCL, GTx's restated certificate of incorporation or its amended and restated bylaws or as to which the DGCL confers jurisdiction on the Court of Chancery of the State of Delaware, or for any action asserting a claim governed by the internal affairs doctrine. The choice of forum provision may limit a stockholder's ability to bring a claim in a judicial forum that it finds favorable for disputes with GTx or its directors, officers or other employees, which may discourage such lawsuits against GTx and its directors, officers and other employees. If a court were to find the choice of forum provision contained in GTx's amended and restated bylaws to be inapplicable or unenforceable in an action, GTx may incur additional costs associated with resolving such action in other jurisdictions, which could harm its financial condition.

If there are substantial sales of GTx's common stock, the market price of its common stock could drop substantially, even if its business is doing well.

For the 12-month period ended December 31, 2018, the average daily trading volume of GTx's common stock on the Nasdaq Capital Market was only 705,027 shares. As a result, future sales of a substantial number of shares of its common stock in the public market, or the perception that such sales may occur, could adversely affect the then-prevailing market price of GTx's common stock. As of December 31, 2018, GTx had 24,051,844 shares of

common stock outstanding. In addition, as a result of the low trading volume of its common stock, which was exacerbated by the 2016 Reverse Stock Split, the trading of relatively small quantities of shares by its stockholders may disproportionately influence the market price of its common stock in either direction. The price for GTx shares could, for example, decline significantly in the event that a large number of its common shares are sold on the market without commensurate demand, as compared to an issuer with a higher trading volume that could better absorb those sales without an adverse impact on its stock price. In addition, due to the limitations of its market, the volatility in the market price of GTx common stock and its currently-depressed stock price, stockholders may face difficulties in selling shares at attractive prices when they want to sell.

In September 2017, GTx completed a private placement of 5.5 million shares of its common stock and warrants to purchase 3.3 million shares of its common stock. In November 2014, GTx completed a private placement of 6.4 million shares of its common stock and warrants to purchase 6.4 million shares of its common stock (as adjusted to give effect to the 2016 Reverse Stock Split). Similarly, in March 2014 GTx completed a private placement of 1.2 million shares of its common stock and warrants to purchase 1.0 million shares of its common stock (as adjusted to give effect to the 2016 Reverse Stock Split). Pursuant to the terms of the registration rights or securities purchase agreements GTx entered into in connection with these private placements, GTx has filed registration statements under the Securities Act registering the resale of an aggregate of approximately 23.8 million shares of common stock that GTx issued to, or are issuable upon the exercise of warrants that GTx issued to, the investors in these private placements, which investors include its largest stockholders. Moreover, J.R. Hyde, III and certain of his affiliates, have rights under a separate registration rights agreement with GTx to require GTx to file resale registration statements covering an additional 785,000 shares of common stock held in the aggregate or to include these shares in registration statements that GTx may file for itself or other stockholders. If Mr. Hyde or his affiliates or any of GTx's other significant stockholders, including the other investors in GTx's private placements, were to sell large blocks of shares in a short period of time, the market price of GTx's common stock could drop substantially.

The comprehensive U.S. tax reform bill passed in 2017 could adversely affect GTx's business and financial condition.

On December 22, 2017, President Trump signed the Tax Act into law, which significantly revised the Code. The Tax Act, among other things, contained significant changes to corporate taxation, including reduction of the corporate tax rate from a top marginal rate of 35% to a flat rate of 21%, limitation of the tax deduction for interest expense to 30% of adjusted taxable income (except for certain small businesses), limitation of the deduction for NOLs generated in tax years beginning after December 31, 2017 to 80% of current year taxable income and elimination of carrybacks of NOLs arising in taxable years ending after December 31, 2017, one-time taxation of offshore earnings at reduced rates regardless of whether they are repatriated, immediate deductions for certain new investments instead of deductions for depreciation expense over time, and modifying or repealing many business deductions and credits (including reducing the business tax credit for certain clinical testing expenses incurred in the testing of certain drugs for rare diseases or conditions). Notwithstanding the reduction in the corporate income tax rate, the overall impact of the Tax Act could adversely affect GTx. In addition, it is uncertain if and to what extent various states will conform to the Tax Act. The impact of the Tax Act on holders of GTx's common stock is also uncertain and could be adverse. GTx urges its stockholders to consult with their legal and tax advisors with respect to this legislation and the potential tax consequences of investing in or holding GTx common stock.

Risks Related to Oncternal

Risks Related to Oncternal's Limited Operating History, Financial Position and Capital Requirements

Oncternal has a limited operating history, has incurred significant operating losses since its inception and expects to incur significant losses for the foreseeable future. Oncternal may never generate any revenue or become profitable or, if Oncternal achieves profitability, it may not be able to sustain it.

Biopharmaceutical product development is a highly speculative undertaking and involves a substantial degree of risk. Oncternal is a clinical-stage biopharmaceutical company with a limited operating history upon which you can evaluate Oncternal's business and prospects. Oncternal commenced operations in 2013, and to date, Oncternal has focused primarily on organizing and staffing its company, business planning, raising capital, identifying, acquiring and in-licensing Oncternal's product candidates and conducting preclinical studies and early-stage clinical trials. Cirmtuzumab and TK216 are in clinical development, while Oncternal's other development programs, including its ROR1 CAR-T program, remain in the preclinical stage. Oncternal has not yet demonstrated an ability to successfully obtain regulatory approvals, manufacture a commercial scale product, or arrange for a third-party to do so on Oncternal's behalf, or embark on sales and marketing activities necessary for successful post regulatory approval product commercialization, and has not developed any companion diagnostic test for its product candidates. Consequently, any predictions made about Oncternal's future success or viability may not be as accurate as they could be if Oncternal had a history of successfully developing and commercializing biopharmaceutical products.

Oncternal has incurred significant operating losses since its inception. If Oncternal's product candidates are not successfully developed and approved, it may never generate any revenue. Oncternal's net losses were $6.6 million and $10.4 million for the years ended December 31, 2018, and December 31, 2017, respectively. As of December 31, 2018, Oncternal had an accumulated deficit of $31.4 million. Substantially all of Oncternal's losses have resulted from expenses incurred in connection with its research and development programs and from general and administrative costs associated with Oncternal's operations. All of Oncternal's product candidates will require substantial additional development time and resources before Oncternal would be able to apply for or receive regulatory approvals and begin generating revenue from product sales. Oncternal expects to continue to incur losses for the foreseeable future, and anticipates these losses will increase substantially as Oncternal continues to develop, seek regulatory approval for and potentially commercialize any of Oncternal's product candidates, and seeks to identify, assess, acquire, in-license or develop additional product candidates.

To become and remain profitable, Oncternal must succeed in developing and eventually commercializing products that generate significant revenue. This will require Oncternal to be successful in a range of challenging activities, including completing clinical trials and preclinical studies of its product candidates, obtaining regulatory approval for these product candidates and manufacturing, marketing and selling any products for which Oncternal may obtain regulatory approval. Oncternal is only in the preliminary stages of most of these activities. Oncternal may never succeed in these activities and, even if it does, may never generate revenues that are significant enough to achieve profitability. In addition, Oncternal has not yet demonstrated an ability to successfully overcome many of the risks and uncertainties frequently encountered by companies in new and rapidly evolving fields, particularly in the biopharmaceutical industry. Because of the numerous risks and uncertainties associated with biopharmaceutical product development, Oncternal is unable to accurately predict the timing or amount of increased expenses or when, or if, Oncternal will be able to achieve profitability. Even if Oncternal does achieve profitability, it may not be able to sustain or increase profitability on a quarterly or annual basis. Oncternal's failure to become and remain profitable would depress the value of Oncternal and could impair its ability to raise capital, expand its business, maintain its research and development efforts, diversify its product candidates or even continue its operations. A decline in the value of Oncternal could also cause stockholders to lose all or part of their investment.

Oncternal will require substantial additional financing to achieve its goals, and a failure to obtain this necessary capital when needed and on acceptable terms, or at all, could force Oncternal to delay, limit, reduce or terminate its product development programs, commercialization efforts or other operations.

The development of biopharmaceutical product candidates is capital-intensive. Oncternal expects its expenses to increase in connection with its ongoing activities, particularly as Oncternal conducts its ongoing and planned clinical trials of cirmtuzumab and TK216, continues research and development and initiates clinical trials of Oncternal's other development programs and seeks regulatory approval for its current product candidates and any future product candidates Oncternal may develop. In addition, as Oncternal's product candidates progress through development and toward commercialization, Oncternal will need to make milestone payments to the licensors and other third parties from whom Oncternal has in-licensed or acquired its product candidates, including cirmtuzumab, TK216 and CAR-T. If Oncternal obtains regulatory approval for any of its product candidates, Oncternal also expects to incur significant commercialization expenses related to product manufacturing, marketing, sales and distribution. Because the outcome of any clinical trial or preclinical study is highly uncertain, Oncternal cannot reasonably estimate the actual amounts necessary to successfully complete the development and commercialization of its product candidates. Furthermore, following the completion of the merger, Oncternal will incur the additional costs associated with operating as a public company. Accordingly, Oncternal will need to obtain substantial additional funding in connection with its continuing operations. If Oncternal is unable to raise capital when needed or on attractive terms, Oncternal could be forced to delay, reduce or eliminate its research and development programs or any future commercialization efforts.

Oncternal has based its estimates on assumptions that may prove to be wrong, and Oncternal could use its capital resources sooner than it currently expects. Oncternal's operating plans and other demands on its cash resources may change as a result of many factors currently unknown to Oncternal, and Oncternal may need to seek additional funds sooner than planned, through public or private equity or debt financings or other capital sources, including potentially government funding, collaborations, licenses and other similar arrangements. In addition, Oncternal may seek additional capital due to favorable market conditions or strategic considerations even if Oncternal believes it has sufficient funds for its current or future operating plans. Attempting to secure additional financing may divert Oncternal's management from its day-to-day activities, which may adversely affect Oncternal's ability to develop its product candidates.

Oncternal's future capital requirements will depend on many factors, including:

- the type, number, scope, progress, expansions, results, costs and timing of, its clinical trials and preclinical studies of product candidates that Oncternal is pursuing or may choose to pursue in the future;
- Oncternal's efforts to evaluate, develop or partner the GTx product candidates, including the SARD assets;
- the costs and timing of manufacturing for Oncternal's product candidates, including commercial manufacturing if any product candidate is approved;
- the costs, timing and outcome of regulatory review of Oncternal's product candidates;
- the costs of obtaining, maintaining and enforcing Oncternal's patents and other intellectual property rights;
- Oncternal's efforts to enhance operational systems and hire additional personnel to satisfy its obligations as a public company, including enhanced internal controls over financial reporting;
- the costs associated with hiring additional personnel and consultants as Oncternal's clinical and other development activities increase;
- the timing and amount of the milestone or other payments Oncternal must make to the licensors and other third parties from whom Oncternal has in-licensed or acquired its product candidates or technology;

- the costs and timing of establishing or securing sales and marketing capabilities if any product candidate is approved;
- Oncternal's ability to achieve sufficient market acceptance, coverage and adequate reimbursement from third-party payors and adequate market share and revenue for any approved products;
- the terms and timing of establishing and maintaining collaborations, licenses and other similar arrangements; and
- costs associated with any products or technologies that Oncternal may in-license or acquire.

Conducting clinical trials and preclinical studies is a time consuming, expensive and uncertain process that takes years to complete, and Oncternal may never generate the necessary data or results required to obtain regulatory approval and achieve product sales. In addition, Oncternal's product candidates, if approved, may not achieve commercial success. Oncternal's commercial revenues, if any, will be derived from sales of products that Oncternal does not expect to be commercially available for many years, if at all.

Accordingly, Oncternal will need to continue to rely on additional financing to achieve its business objectives. Adequate additional financing may not be available to Oncternal on acceptable terms, or at all. In addition, Oncternal may seek additional capital due to favorable market conditions or strategic considerations, even if Oncternal believes it has sufficient funds for its current or future operating plans.

Raising additional capital may cause dilution to Oncternal's stockholders, restrict Oncternal's operations or require Oncternal to relinquish rights to its technologies or product candidates.

Until such time, if ever, as Oncternal can generate substantial product revenues, Oncternal expects to finance its cash needs through equity offerings, debt financings or other capital sources, including potentially government funding, collaborations, licenses and other similar arrangements. To the extent that Oncternal raises additional capital through the sale of equity or convertible debt securities, existing stockholders' ownership interest will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect stockholders' rights as a common stockholder. Debt financing and preferred equity financing, if available, may involve agreements that include covenants limiting or restricting Oncternal's ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends.

If Oncternal raises funds through future collaborations, licenses and other similar arrangements, Oncternal may have to relinquish valuable rights to its future revenue streams, research programs or product candidates or grant licenses on terms that may not be favorable to Oncternal and/or that may reduce the value of Oncternal's common stock.

Risks Related to the Discovery, Development and Regulatory Approval of Oncternal's Product Candidates

Oncternal depends heavily on the success of cirmtuzumab and TK216, which are in Phase 1 or Phase 2 clinical trials, as well as its ROR1 CAR-T program, which is in preclinical development. If Oncternal is unable to advance its product candidates in clinical development, obtain regulatory approval and ultimately commercialize its product candidates, or experiences significant delays in doing so, Oncternal's business will be materially harmed.

Oncternal's two clinical-stage product candidates are in Phase 1 or Phase 2 clinical development. In May 2018, Oncternal commenced a Phase 1b/2 clinical trial evaluating cirmtuzumab in combination with ibrutinib in patients with MCL and CLL. In addition, TK216 is currently being evaluated in a Phase 1 clinical trial in patients with relapsed or refractory Ewing sarcoma. Oncternal plans to initiate a Phase 1 clinical trial of TK216 in AML, and to commence IND-enabling preclinical studies for TK216 for the treatment of patients with prostate cancer. Additionally, Oncternal's ROR1 CAR-T program will need further preclinical development and IND-enabling studies prior to commencing clinical development. None of Oncternal's product candidates

have advanced into a pivotal or registrational study for the indications for which Oncternal is studying them. Oncternal's ability to generate product revenues, which Oncternal does not expect will occur for many years, if ever, will depend heavily on the successful development and eventual commercialization of its product candidates. The success of Oncternal's product candidates will depend on various factors, including the following:

- successful completion of preclinical and clinical studies with favorable results;
- acceptance of INDs by the FDA or similar regulatory filing by comparable foreign regulatory authorities for the conduct of clinical trials of Oncternal's product candidates and its proposed designs for future clinical trials;
- demonstrating safety and efficacy of Oncternal's product candidates to the satisfaction of applicable regulatory authorities;
- receiving marketing approvals from applicable regulatory authorities, including Biologics License Applications ("BLAs"), or new drug applications ("NDAs"), from the FDA and maintaining such approvals;
- making arrangements with Oncternal's third-party manufacturers for commercial manufacturing capabilities for Oncternal's product candidates;
- establishing sales, marketing and distribution capabilities and launching commercial sales of Oncternal's product candidates, if and when approved, whether alone or in collaboration with others;
- establishing and maintaining patent and trade secret protection or regulatory exclusivity for Oncternal's product candidates;
- the demonstration of an acceptable safety profile of Oncternal's products following approval, if any;
- developing, in-licensing or acquiring companion diagnostics to Oncternal's product candidates; and
- maintaining and growing an organization for people who can develop Oncternal's product candidates and technology.

The success of Oncternal's business, including its ability to finance the company and generate any revenue in the future, will primarily depend on the successful development, regulatory approval and commercialization of Oncternal's product candidates, which may never occur. Oncternal has not yet succeeded and may not succeed in demonstrating efficacy and safety for any of its product candidates in clinical trials or in obtaining marketing approval thereafter. Given Oncternal's early stage of development, it may be several years, if at all, before Oncternal has demonstrated the safety and efficacy of a product candidate sufficient to warrant approval for commercialization. If Oncternal is unable to develop, or obtain regulatory approval for, or, if approved, successfully commercialize its product candidates, Oncternal may not be able to generate sufficient revenue to continue its business.

Clinical drug development involves a lengthy and expensive process with an uncertain outcome, and the results of preclinical studies and early clinical trials are not necessarily predictive of future results. Oncternal's product candidates may not have favorable results in clinical trials or receive regulatory approval on a timely basis, if at all.

Clinical drug development is expensive and can take many years to complete, and its outcome is inherently uncertain. Oncternal cannot guarantee that any clinical trials will be conducted as planned or completed on schedule, if at all, and failure can occur at any time during the preclinical study or clinical trial process. Despite promising preclinical or clinical results, any product candidate can unexpectedly fail at any stage of preclinical or clinical development. The historical failure rate for product candidates in Oncternal's industry is high.

The results from preclinical studies or clinical trials of a product candidate may not predict the results of later clinical trials of the product candidate, and interim results of a clinical trial are not necessarily indicative of final

results. Product candidates in later stages of clinical trials may fail to show the desired safety and efficacy characteristics despite having progressed through preclinical studies and initial clinical trials. In particular, while cirmtuzumab was well tolerated and was shown to inhibit ROR1 signaling in patients with CLL in early clinical trials, we do not know how cirmtuzumab will perform in the Phase 1b/2 clinical trial in combination with ibrutinib or any other future clinical trials, including as a result of any differences in the target population, drug interactions or other differences in our trial design. It is not uncommon to observe results in clinical trials that are unexpected based on preclinical studies and early clinical trials, and many product candidates fail in clinical trials despite very promising early results. Under the License and Development Agreement (the "SPH USA License Agreement") by and between Oncternal and SPH USA, SPH USA has the right to manufacture, develop, market, distribute and sell Oncternal's cirmtuzumab, ROR1 CAR-T, and TK216 product candidates in the People's Republic of China, Hong Kong, Macau and Taiwan ("Greater China"), and the obligation to perform all preclinical and clinical development activities required to obtain regulatory approvals for such product candidates in Greater China. In the event that SPH USA's preclinical studies or clinical trials of Oncternal's product candidates raise new safety or efficacy concerns, the prospects for obtaining regulatory approval of Oncternal's product candidates in the United States and other countries, and Oncternal's business, could be adversely impacted.

Moreover, this and any future preclinical and clinical data may be susceptible to varying interpretations and analyses. A number of companies in the pharmaceutical and biotechnology industries have suffered significant setbacks in clinical development even after achieving promising results in earlier studies. Furthermore, we cannot assure you that we will be able to successfully progress our preclinical programs from candidate identification to Phase 1 clinical development.

For the foregoing reasons, Oncternal cannot be certain that its ongoing and planned clinical trials and preclinical studies will be successful. Any safety concerns observed in any one of Oncternal's clinical trials in its targeted indications could limit the prospects for regulatory approval of Oncternal's product candidates in those and other indications, which could have a material adverse effect on Oncternal's business, financial condition and results of operations.

Any difficulties or delays in the commencement or completion, or termination or suspension, of Oncternal's current or planned clinical trials could result in increased costs to Oncternal, delay or limit its ability to generate revenue, and adversely affect its commercial prospects.

Before obtaining marketing approval from regulatory authorities for the sale of Oncternal's product candidates, Oncternal must conduct extensive clinical studies to demonstrate the safety and efficacy of the product candidates in humans. Oncternal is currently enrolling a Phase 1b/2a trial of cirmtuzumab in combination with ibrutinib in patients with CLL and MCL and conducting a dose-escalation Phase 1 trial of TK216 in patients with relapsed or refractory Ewing sarcoma. Oncternal will have to follow the same procedure for its other preclinical product candidates that Oncternal plans to advance to clinical development, and would also be required to submit regulatory filings to foreign regulatory authorities if Oncternal decides to initiate clinical trials outside of the United States.

Oncternal does not know whether its planned trials will begin on time or be completed on schedule, if at all. The commencement and completion of clinical trials can be delayed for a number of reasons, including delays related to:

- subjects failing to enroll or remain in Oncternal's trial at the rate Oncternal expects, or failing to return for post-treatment follow-up;
- subjects choosing an alternative treatment for the indication for which Oncternal is developing its product candidates, or participating in competing clinical trials;
- the FDA or comparable foreign regulatory authorities disagreeing as to the design or implementation of Oncternal's clinical studies;

- difficulties in obtaining regulatory authorizations to commence a trial or reaching a consensus with regulatory authorities on trial design;
- difficulties in recruiting clinical trial investigators with the appropriate competencies and experience;
- failure or delay in reaching an agreement with contract research organizations, or CROs, and clinical trial sites, the terms of which can be subject to extensive negotiation and may vary significantly among different CROs and trial sites;
- delays in obtaining approval from one or more institutional review boards, or IRBs;
- IRBs refusing to approve, suspending or terminating the trial at an investigational site, precluding enrollment of additional subjects, or withdrawing their approval of the trial;
- changes to clinical trial protocols;
- clinical sites deviating from trial protocols or dropping out of a trial;
- challenges in manufacturing sufficient quantities of product candidates or obtaining sufficient quantities of combination therapies for use in clinical trials;
- lack of adequate funding to continue clinical trials;
- subjects experiencing severe or unexpected drug-related adverse effects;
- occurrence of serious adverse events in clinical trials of the same class of agents conducted by other companies;
- selection of clinical endpoints that require prolonged periods of clinical observation or analysis of the resulting data;
- a facility manufacturing Oncternal's product candidates or any of their components being ordered by the FDA or comparable foreign regulatory authorities to temporarily or permanently shut down due to violations of current Good Manufacturing Practices ("cGMP") regulations or other applicable requirements, or infections or cross-contaminations of product candidates in the manufacturing process;
- any changes to Oncternal's manufacturing process that may be necessary or desired;
- third-party clinical investigators losing the licenses or permits necessary to perform Oncternal's clinical trials, not performing Oncternal's clinical trials in a timely manner or consistent with applicable clinical trial protocols, good clinical practices ("GCP"), or other regulatory requirements; third-party contractors not performing data collection or analysis in a timely or accurate manner; or
- third-party contractors becoming debarred or suspended or otherwise penalized by the FDA or other government or regulatory authorities for violations of regulatory requirements, in which case Oncternal may need to find a substitute contractor, and Oncternal may not be able to use some or all of the data produced by such contractors in support of Oncternal's marketing applications.

Oncternal could also encounter delays if its clinical trials are suspended or terminated by Oncternal, by the IRBs of the institutions in which such trials are being conducted, by a Data Safety Monitoring Board for such trial, or by the FDA or comparable foreign regulatory authorities. Regulatory authorities may suspend or terminate clinical trials due to a number of factors, including failure to conduct clinical trials in accordance with regulatory requirements or the applicable clinical protocols, inspection of the clinical trial operations or trial site by the FDA or comparable foreign regulatory authorities resulting in the imposition of a clinical hold, unforeseen safety issues or adverse side effects, failure to demonstrate a benefit from using a drug, changes in governmental regulations or administrative actions or lack of adequate funding to continue the clinical trial. In addition, changes in regulatory requirements and policies may occur, and Oncternal may need to amend clinical trial protocols to comply with these changes. Amendments may require Oncternal to resubmit its clinical trial protocols to IRBs for reexamination, which may impact the costs, timing or successful completion of a clinical trial.

Further, if Oncternal decides to conduct clinical trials of its product candidates in foreign countries additional risks may arise that may delay completion of those clinical trials. These risks include the failure of enrolled patients in other countries to adhere to clinical protocol as a result of differences in healthcare practices or cultural customs, managing additional administrative burdens associated with the regulatory schemes of other countries, as well as political and economic risks relevant to other countries. Under Oncternal's license and development agreement with SPH USA, SPH USA has the right to manufacture, develop, market, distribute and sell Oncternal's cirmtuzumab, ROR1 CAR-T, and TK216 product candidates in the People's Republic of China, Hong Kong, Macau and Taiwan, or Greater China, and the obligation to perform all preclinical and clinical development activities required to obtain regulatory approvals for such product candidates in Greater China. In the event that SPH USA's preclinical studies or clinical trials of Oncternal's product candidates raise new safety or efficacy concerns, the prospects for obtaining regulatory approval of Oncternal's product candidates in the United States and other countries, and Oncternal's business, could be adversely impacted.

Moreover, principal investigators for Oncternal's clinical trials may serve as scientific advisors or consultants to Oncternal from time to time and receive compensation in connection with such services. Under certain circumstances, Oncternal may be required to report some of these relationships to the FDA or comparable foreign regulatory authorities. The FDA or comparable foreign regulatory authority may conclude that a financial relationship between Oncternal and a principal investigator has created a conflict of interest or otherwise affected interpretation of the study. The FDA or comparable foreign regulatory authority may therefore question the integrity of the data generated at the applicable clinical trial site and the utility of the clinical trial itself may be jeopardized. This could result in a delay in approval, or rejection, of Oncternal's marketing applications by the FDA or comparable foreign regulatory authority, as the case may be, and may ultimately lead to the denial of marketing approval of one or more of Oncternal's product candidates.

If Oncternal experiences delays in the completion of, or termination of, clinical trials of its product candidates, the commercial prospects of such product candidates may be harmed, and its ability to generate product revenues from such product candidates may be delayed. Moreover, delays in completing Oncternal's clinical trials may increase its costs, slow down its product candidate development and approval process and jeopardize its ability to commence product sales and generate revenues.

In addition, many of the factors that cause, or lead to, the termination, suspension or delay in the commencement or completion of, clinical trials may also ultimately lead to the denial of regulatory approval of a product candidate. If Oncternal makes formulation or manufacturing changes to its product candidates, it may be required to conduct additional preclinical or clinical studies to bridge its modified product candidates to earlier versions. The need to conduct additional preclinical or clinical studies could result in delays in the approval or commercialization of Oncternal's product candidates, which could shorten any period during which Oncternal may have the exclusive right to commercialize its product candidates and enable Oncternal's competitors to bring products to market before Oncternal does. In such an event, the commercial viability of Oncternal's product candidates could be significantly reduced. Any of these occurrences may harm Oncternal's business, financial condition and prospects significantly.

Oncternal may find it difficult to enroll patients in its clinical trials. If Oncternal encounters difficulties enrolling subjects in its clinical trials, its clinical development activities could be delayed or otherwise adversely affected.

Oncternal may not be able to initiate or continue clinical trials for its product candidates if Oncternal is unable to identify and enroll a sufficient number of eligible patients to participate in these trials as required by the FDA or similar regulatory authorities outside the United States. Subject enrollment, a significant factor in the timing of clinical trials, is affected by many factors including the size and nature of the patient population, the proximity of patients to clinical sites, the eligibility and exclusion criteria for the trial, the design of the clinical trial, the availability of competing clinical trials and clinicians' and patients' perceptions as to the potential advantages and risks of the product candidate being studied in relation to other available therapies, including any new drugs

that may be approved for the indications Oncternal is investigating as well as any drugs under development. Oncternal will be required to identify and enroll a sufficient number of subjects for each of its clinical trials. Potential subjects for any planned clinical trials may not be adequately diagnosed or identified with the diseases which Oncternal is targeting or may not meet the entry criteria for such trials. . For example, a limited number of patients are affected by CLL, MCL and particularly Ewing sarcoma, which are Oncternal's initial target indications for cirmtuzumab and TK216. Oncternal also may encounter difficulties in identifying and enrolling subjects with a stage of disease appropriate for Oncternal's planned clinical trials. Oncternal may not be able to initiate or continue clinical trials if Oncternal is unable to locate a sufficient number of eligible subjects to participate in the clinical trials required by the FDA or comparable foreign regulatory authorities. In addition, the process of finding and diagnosing subjects may prove costly.

The timing of Oncternal's clinical trials depends, in part, on the speed at which Oncternal can recruit patients to participate in its trials, as well as completion of required follow-up periods. For certain of Oncternal's product candidates, including cirmtuzumab and TK216, the conditions which Oncternal currently plans to evaluate are orphan or rare diseases with limited patient pools from which to draw for clinical trials. The eligibility criteria of Oncternal's clinical trials will further limit the pool of available trial participants. If patients are unwilling to participate in Oncternal's trials for any reason, including the existence of concurrent clinical trials for similar patient populations or the availability of approved therapies, or Oncternal otherwise has difficulty enrolling a sufficient number of patients, the timeline for recruiting subjects, conducting studies and obtaining regulatory approval of Oncternal's product candidates may be delayed. Oncternal's inability to enroll a sufficient number of subjects for any of its clinical trials would result in significant delays or may require Oncternal to abandon one or more clinical trials altogether. In addition, Oncternal expects to rely on CROs and clinical trial sites to ensure proper and timely conduct of its future clinical trials and, while Oncternal intends to enter into agreements governing their services, Oncternal will have limited influence over their actual performance.

Oncternal cannot assure stockholders that its assumptions used in determining expected clinical trial timelines are correct or that Oncternal will not experience delays in enrollment, which would result in the delay of completion of such trials beyond Oncternal's expected timelines.

Use of Oncternal's product candidates could be associated with side effects, adverse events or other properties or safety risks, which could delay or preclude approval, cause Oncternal to suspend or discontinue clinical trials, abandon a product candidate, limit the commercial profile of the label for an approved product candidate, or result in other significant negative consequences that could severely harm Oncternal's business, prospects, operating results and financial condition.

As is the case with oncology drugs generally, it is likely that there may be side effects and adverse events associated with the use of Oncternal's product candidates. Results of Oncternal's clinical trials could reveal a high and unacceptable severity and prevalence, or unexpected characteristics of side effects. Undesirable side effects caused by Oncternal's product candidates could cause Oncternal or regulatory authorities to interrupt, delay or halt clinical trials, result in a more restrictive label for the product candidate, or delay or cause the denial of regulatory approval of the product candidate by the FDA or comparable foreign regulatory authorities. The drug-related side effects could also affect patient recruitment for Oncternal's clinical trials, or the ability of enrolled patients to complete the trials, or result in potential product liability claims. Any of these occurrences may harm Oncternal's business, financial condition and prospects significantly.

Moreover, if Oncternal's product candidates are associated with undesirable side effects in clinical trials or have characteristics that are unexpected, Oncternal may elect to abandon their development or limit their development to more narrow uses or subpopulations in which the undesirable side effects or other characteristics are less prevalent, less severe or more acceptable from a risk-benefit perspective, which may limit the commercial prospects for the product candidate if approved. Oncternal may also be required to modify its plans for future studies based on findings in Oncternal's ongoing clinical trials. Many compounds that initially showed promise in early-stage testing have later been found to cause side effects that prevented further development of the

compound. In addition, regulatory authorities may draw different conclusions or require additional testing to confirm these determinations.

It is possible that as Oncternal tests its product candidates in larger, longer and more extensive clinical trials, or as the use of these product candidates becomes more widespread if they receive regulatory approval, illnesses, injuries, discomforts and other adverse events that were observed in earlier trials, as well as conditions that did not occur or went undetected in previous trials, will be reported by subjects. If such side effects become known later in development or upon approval, if any, such findings may harm Oncternal's business, financial condition and prospects significantly. In addition, our ongoing clinical trials of cirmtuzumab in combination with ibrutinib and TK216 in combination with vincristine, and the ongoing investigator-initiated clinical trial of cirmtuzumab in combination with paclitaxel, may reveal adverse events based on the combination therapy that may negatively impact the reported safety profile in such clinical trial.

In addition, if one or more of Oncternal's product candidates receives marketing approval, and Oncternal or others later identify undesirable side effects caused by such products, a number of potentially significant negative consequences could result, including:

- regulatory authorities may withdraw, suspend or limit approvals of such product;
- Oncternal may be required to recall a product or change the way such product is administered to patients;
- regulatory authorities may require additional warnings on the label, such as a "black box" warning or a contraindication;
- Oncternal may be required to implement a Risk Evaluation and Mitigation Strategy, or REMS, or create a medication guide outlining the risks of such side effects for distribution to patients;
- Oncternal may be required to change the way a product is distributed or administered, conduct additional clinical trials or change the labeling of a product or be required to conduct additional post-marketing studies or surveillance;
- Oncternal could be sued and held liable for harm caused to patients;
- sales of the product may decrease significantly or the product could become less competitive; and
- Oncternal's reputation could suffer.

Any of these events could prevent Oncternal from achieving or maintaining market acceptance of the particular product candidate, if approved, and could significantly harm Oncternal's business, results of operations and prospects.

The regulatory landscape that will apply to development of gene therapy or cell-based therapeutic product candidates by Oncternal or its collaborators is rigorous, complex, uncertain and subject to change, which could result in delays or termination of development of such product candidates or unexpected costs in obtaining regulatory approvals.

Regulatory requirements governing products involving gene therapy treatment have changed frequently and will likely continue to change in the future. Approvals by one regulatory agency may not be indicative of what any other regulatory agency may require for approval, and there is substantial, and sometimes uncoordinated, overlap in those responsible for regulation of gene therapy products, cell therapy products and other products created with genome editing technology. For example, in addition to the submission of an investigational new drug application, or IND, to the FDA, before initiation of a clinical trial in the United States, certain human clinical trials for cell therapy products and gene therapy had historically been subject to review by the Recombinant DNA Advisory Committee (the "RAC"), of the National Institutes of Health ("NIH"), Office of Biotechnology Activities ("OBA"), pursuant to the NIH Guidelines for Research Involving Recombinant DNA Molecules ("NIH

Guidelines"). Following an initial review, RAC members would make a recommendation as to whether the protocol raises important scientific, safety, medical, ethical or social issues that warrant in-depth discussion at the RAC's quarterly meetings. Even though the FDA decides whether individual cell therapy or gene therapy protocols may proceed under an IND, the RAC's recommendations were shared with the FDA and the RAC public review process, if undertaken, could delay the initiation of a clinical trial, even if the FDA had reviewed the trial design and details and has not objected to its initiation or has notified the sponsor that the study may begin. Conversely, the FDA could have put an IND on clinical hold even if the RAC provided a favorable review or had recommended against an in-depth, public review. On August 17, 2018, the NIH issued a notice in the Federal Register and issued a public statement proposing changes to the oversight framework for gene therapy trials, including changes to the applicable NIH Guidelines to modify the roles and responsibilities of the RAC with respect to human clinical trials of gene therapy products, and requesting public comment on its proposed modifications. The NIH announced that during the public comment period, which closed October 16, 2018, it would no longer accept new human gene transfer protocols for review as part of the protocol registration process under the existing NIH Guidelines or convene the RAC to review individual clinical protocols. These trials remain subject to the FDA's oversight and other clinical trial regulations, and oversight at the local level will continue as otherwise set forth in the NIH Guidelines. Specifically, under the NIH Guidelines, supervision of human gene transfer trials includes evaluation and assessment by an institutional biosafety committee, or IBC, a local institutional committee that reviews and oversees research utilizing recombinant or synthetic nucleic acid molecules at that institution. The IBC assesses the safety of the research and identifies any potential risk to public health or the environment, and such review may result in some delay before initiation of a clinical trial. While the NIH Guidelines are not mandatory unless the research in question is being conducted at or sponsored by institutions receiving NIH funding of recombinant or synthetic nucleic acid molecule research, many companies and other institutions not otherwise subject to the NIH Guidelines voluntarily follow them. Even though Oncternal may not be required to submit a protocol for its gene therapy product candidates such as a ROR1 targeted CAR-T through the NIH for RAC review, Oncternal will still be subject to significant regulatory oversight by the FDA, and in addition to the government regulators, the applicable IBC and institutional review board, or IRB, of each institution at which Oncternal or its collaborators conduct clinical trials of its product candidates, or a central IRB if appropriate, would need to review and approve the proposed clinical trial.

The same applies in the European Union. The European Medicines Agency (the "EMA"), has a Committee for Advanced Therapies, or CAT, that is responsible for assessing the quality, safety and efficacy of advanced therapy medicinal products. Advanced-therapy medical products include gene therapy medicine, somatic-cell therapy medicines and tissue-engineered medicines. The role of the CAT is to prepare a draft opinion on an application for marketing authorization for a gene therapy medicinal candidate that is submitted to the EMA. In the European Union, the development and evaluation of a gene therapy medicinal product must be considered in the context of the relevant European Union guidelines. The EMA may issue new guidelines concerning the development and marketing authorization for gene therapy medicinal products and require that Oncternal complies with these new guidelines. Similarly complex regulatory environments exist in other jurisdictions in which Oncternal might consider seeking regulatory approvals for Oncternal's product candidates, further complicating the regulatory landscape. As a result, the procedures and standards applied to gene therapy products and cell therapy products may be applied to any of Oncternal's gene therapy product candidates such as CAR-T, but that remains uncertain at this point.

The clinical trial requirements of the FDA, the EMA and other regulatory authorities and the criteria these regulators use to evaluate the safety and efficacy of a product candidate vary substantially according to the type, complexity, novelty and intended use and market of the potential products. The regulatory approval process for product candidates involving gene therapy can be more lengthy, rigorous and expensive than the process for other better known or more extensively studied product candidates and technologies. Since Oncternal is developing novel treatments for diseases in which there is little clinical experience with new endpoints and methodologies, there is heightened risk that the FDA, the EMA or comparable regulatory bodies may not consider the clinical trial endpoints to provide clinically meaningful results, and the resulting clinical data and results may be more difficult to analyze. This may be a particularly significant risk for many of the genetically

defined diseases for which Oncternal may develop product candidates alone or with collaborators due to small patient populations for those diseases, and designing and executing a rigorous clinical trial with appropriate statistical power is more difficult than with diseases that have larger patient populations. Regulatory agencies administering existing or future regulations or legislation may not allow production and marketing of products utilizing gene therapy in a timely manner or under technically or commercially feasible conditions. Even if Oncternal's product candidates obtain required regulatory approvals, such approvals may later be withdrawn as a result of changes in regulations or the interpretation of regulations by applicable regulatory agencies.

Changes in applicable regulatory guidelines may lengthen the regulatory review process for Oncternal's product candidates, require additional studies or trials, increase development costs, lead to changes in regulatory positions and interpretations, delay or prevent approval and commercialization of such product candidates, or lead to significant post-approval limitations or restrictions. Additionally, adverse developments in clinical trials of gene therapy products conducted by others, may cause the FDA, the EMA and other regulatory bodies to revise the requirements for approval of any product candidates Oncternal may develop or limit the use of products utilizing gene therapy, either of which could materially harm Oncternal's business. Furthermore, regulatory action or private litigation could result in increased expenses, delays or other impediments to Oncternal's research programs or the development or commercialization of current or future product candidates.

As Oncternal advances its product candidates alone or with collaborators, Oncternal will be required to consult with these regulatory and advisory groups and comply with all applicable guidelines, rules and regulations. If Oncternal fails to do so, it or its collaborators may be required to delay or terminate development of such product candidates. Delay or failure to obtain, or unexpected costs in obtaining, the regulatory approval necessary to bring a product candidate to market could decrease Oncternal's ability to generate sufficient product revenue to maintain its business.

As an organization, Oncternal has limited experience in the process of enrolling patients in its clinical trials, has never conducted later-stage clinical trials or submitted a BLA or an NDA, and may be unable to do so for any of Oncternal's product candidates.

Oncternal is early in its development efforts for its product candidates, and will need to successfully complete later-stage and pivotal clinical trials in order to obtain FDA or comparable foreign regulatory approval to market cirmtuzumab, TK216, ROR1 CAR-T, or any future product candidates. Carrying out later-stage clinical trials and submitting a successful BLA or NDA is a complicated process. As an organization, Oncternal is in the process of conducting a Phase 1b/2 clinical trial for cirmtuzumab in combination with ibrutinib and a Phase 1 clinical trial for TK216, alone and in combination with vincristine. Oncternal has not yet conducted any clinical trials for its other product candidates. Oncternal has not previously conducted any later stage or pivotal clinical trials, has limited experience as a company in preparing, submitting and prosecuting regulatory filings and has not previously submitted a BLA, an NDA or other comparable foreign regulatory submission for any product candidate. In addition, Oncternal has had limited interactions with the FDA and cannot be certain how many additional clinical trials of cirmtuzumab, TK216 or any other product candidates will be required or how such trials should be designed. Oncternal may be unable to successfully and efficiently execute and complete necessary clinical trials in a way that leads to regulatory submission and approval of any of Oncternal's product candidates. Oncternal may require more time and incur greater costs than its competitors and may not succeed in obtaining regulatory approvals of product candidates that it develops. Failure to commence or complete, or delays in Oncternal's planned clinical trials could delay or prevent Oncternal from submitting BLAs or NDAs for, and commercializing, its product candidates.

Oncternal's product candidates are subject to extensive regulation and compliance, which is costly and time consuming, and such regulation may cause unanticipated delays or prevent the receipt of the required approvals to commercialize Oncternal's product candidates.

The clinical development, manufacturing, labeling, storage, record-keeping, advertising, promotion, import, export, marketing and distribution of Oncternal's product candidates are subject to extensive regulation by the

FDA in the United States and by comparable foreign regulatory authorities in foreign markets. In the United States, Oncternal is not permitted to market its product candidates until it receives regulatory approval from the FDA. The process of obtaining regulatory approval is expensive, often takes many years following the commencement of clinical trials and can vary substantially based upon the type, complexity and novelty of the product candidates involved, as well as the target indications and patient population. Approval policies or regulations may change, and the FDA has substantial discretion in the drug approval process, including the ability to delay, limit or deny approval of a product candidate for many reasons. Despite the time and expense invested in clinical development of product candidates, regulatory approval is never guaranteed. Oncternal is not permitted to market any of its product candidates in the United States until it receives approval of a BLA or an NDA from the FDA.

Prior to obtaining approval to commercialize a product candidate in the United States or abroad, Oncternal must demonstrate with substantial evidence from adequate and well-controlled clinical trials, and to the satisfaction of the FDA or comparable foreign regulatory authorities, that such product candidates are safe and effective for their intended uses, and in the case of biological products, that such product candidates are safe, pure and potent. Results from nonclinical studies and clinical trials can be interpreted in different ways. Even if Oncternal believes the nonclinical or clinical data for Oncternal's product candidates are promising, such data may not be sufficient to support approval by the FDA and comparable foreign regulatory authorities. The FDA or comparable foreign regulatory authorities, as the case may be, may also require Oncternal to conduct additional preclinical studies or clinical trials for Oncternal's product candidates either prior to or post-approval, or may object to elements of Oncternal's clinical development program.

The FDA or comparable foreign regulatory authorities can delay, limit or deny approval of a product candidate for many reasons, including:

- such authorities may disagree with the design or execution of Oncternal's clinical trials;
- negative or ambiguous results from Oncternal's clinical trials or results may not meet the level of statistical significance required by the FDA or comparable foreign regulatory agencies for approval;
- serious and unexpected drug-related side effects may be experienced by participants in Oncternal's clinical trials or by individuals using drugs similar to Oncternal's product candidates;
- the population studied in the clinical trial may not be sufficiently broad or representative to assure safety in the full population for which Oncternal seeks approval;
- such authorities may not accept clinical data from trials that are conducted at clinical facilities or in countries where the standard of care is potentially different from that of their own country;
- Oncternal may be unable to demonstrate that a product candidate's clinical and other benefits outweigh its safety risks;
- such authorities may disagree with Oncternal's interpretation of data from preclinical studies or clinical trials;
- such authorities may not agree that the data collected from clinical trials of Oncternal's product candidates are acceptable or sufficient to support the submission of a BLA, NDA or other submission or to obtain regulatory approval in the United States or elsewhere, and such authorities may impose requirements for additional preclinical studies or clinical trials;
- such authorities may disagree with Oncternal regarding the formulation, labeling and/or the product specifications of Oncternal's product candidates;
- approval may be granted only for indications that are significantly more limited than those sought by Oncternal, and/or may include significant restrictions on distribution and use;
- such authorities may find deficiencies in the manufacturing processes or facilities of the third-party manufacturers with which Oncternal contracts for clinical and commercial supplies; or

- such authorities may not accept a submission due to, among other reasons, the content or formatting of the submission.

With respect to foreign markets, approval procedures vary among countries and, in addition to the foregoing risks, may involve additional product testing, administrative review periods and agreements with pricing authorities. In addition, events raising questions about the safety of certain marketed pharmaceuticals may result in increased cautiousness by the FDA and comparable foreign regulatory authorities in reviewing new drugs based on safety, efficacy or other regulatory considerations and may result in significant delays in obtaining regulatory approvals. Any delay in obtaining, or inability to obtain, applicable regulatory approvals would prevent Oncternal or any of Oncternal's potential future collaborators from commercializing Oncternal's product candidates.

Of the large number of drugs in development, only a small percentage successfully complete the FDA or foreign regulatory approval processes and are commercialized. The lengthy approval process as well as the unpredictability of future clinical trial results may result in Oncternal's failure to obtain regulatory approval to market its product candidates, which would significantly harm Oncternal's business, financial condition, results of operations and prospects.

Even if Oncternal eventually completes clinical trials and receives approval of a BLA, NDA or comparable foreign marketing application for Oncternal's product candidates, the FDA or comparable foreign regulatory authority may grant approval contingent on the performance of costly additional clinical trials, including Phase 4 clinical trials, and/or the implementation of a REMS, which may be required because the FDA believes it is necessary to ensure safe use of the drug after approval. The FDA or the comparable foreign regulatory authority also may approve a product candidate for a more limited indication or patient population than Oncternal originally requested, and the FDA or comparable foreign regulatory authority may not approve the labeling that Oncternal believes is necessary or desirable for the successful commercialization of a product. Any delay in obtaining, or inability to obtain, applicable regulatory approval would delay or prevent commercialization of that product candidate and would materially adversely impact Oncternal's business and prospects.

Oncternal may expend its limited resources to pursue a particular product candidate and fail to capitalize on product candidates or indications that may be more profitable or for which there is a greater likelihood of success.

Because Oncternal has limited financial and managerial resources, it is focused on specific product candidates, indications and development programs. As a result, Oncternal may forgo or delay the pursuit of opportunities with other indications or other product candidates that could have greater commercial potential. Oncternal's resource allocation decisions may cause Oncternal to fail to capitalize on viable commercial products or profitable market opportunities. Oncternal's spending on current and future research and development programs and product candidates for specific indications may not yield any commercially viable products. If Oncternal does not accurately evaluate the commercial potential for a particular product candidate, it could relinquish valuable rights to that product candidate through collaborations, licenses and other similar arrangements, when it might be more advantageous for Oncternal to retain sole development and commercialization rights to such product candidate.

Fast Track designation by the FDA for TK216 or Oncternal's other product candidates may not actually lead to a faster development or regulatory review or approval process.

Oncternal has been granted a Fast Track designation for TK216 in the United States for the treatment of Ewing sarcoma and may seek Fast Track designation for cirmtuzumab or its other product candidates. The Fast Track program is intended to expedite or facilitate the process for reviewing new product candidates that meet certain criteria. Specifically, new drugs are eligible for Fast Track designation if they are intended, alone or in combination with one or more drugs, to treat a serious or life-threatening disease or condition and demonstrate

the potential to address unmet medical needs for the disease or condition. Fast Track designation applies to the combination of the product candidate and the specific indication for which it is being studied. With a Fast Track product candidate, the FDA may consider for review sections of the NDA or BLA on a rolling basis before the complete application is submitted, if the sponsor provides a schedule for the submission of the sections of the NDA or BLA, the FDA agrees to accept sections of the NDA or BLA and determines that the schedule is acceptable, and the sponsor pays any required user fees upon submission of the first section of the NDA or BLA.

Obtaining a Fast Track designation does not change the standards for product approval, but may expedite the development or approval process. Even though the FDA has granted such designation for TK216, it may not actually result in faster clinical development or regulatory review or approval. Furthermore, such a designation does not increase the likelihood that TK216 or any other product candidate that may be granted Fast Track designation will receive marketing approval in the United States.

Oncternal may not be able to obtain or maintain orphan drug designations for certain of its product candidates, and may be unable to maintain the benefits associated with orphan drug designation, including the potential for market exclusivity.

Regulatory authorities in some jurisdictions, including the United States and Europe, may designate drugs for relatively small patient populations as orphan drugs. Under the Orphan Drug Act of 1983, the FDA may designate a product as an orphan product if it is intended to treat a rare disease or condition, which is generally defined as a patient population of fewer than 200,000 individuals in the United States, or a patient population of greater than 200,000 individuals in the United States, but for which there is no reasonable expectation that the cost of developing the drug will be recovered from sales in the United States. In the European Union, the EMA's, Committee for Orphan Medicinal Products grants orphan drug designation to promote the development of products that are intended for the diagnosis, prevention or treatment of a life-threatening or chronically debilitating condition affecting not more than five in 10,000 persons in the European Union. Oncternal has received orphan drug designation in the United Statements for TK216 for patients with Ewing sarcoma and it may seek orphan drug designation in the European Union for TK216 for patients with Ewing sarcoma, as well as seek orphan drug designation for certain of our other product candidates. There can be no assurance that the FDA or the EMA's Committee for Orphan Medicinal Products will grant orphan designation for any indication for which Oncternal applies, or that Oncternal will be able to maintain such designation.

In the United States, orphan designation entitles a party to financial incentives such as opportunities for grant funding for clinical trial costs, tax advantages and user-fee waivers. In addition, if a product candidate that has orphan designation subsequently receives the first FDA approval for the disease for which it has such designation, the product is entitled to orphan drug exclusivity, which means that the FDA may not approve any other applications, including an NDA or BLA, to market the same drug for the same indication for seven years, except in limited circumstances, such as a showing of clinical superiority to the product with orphan drug exclusivity or where the manufacturer is unable to assure sufficient product quantity. The applicable exclusivity period is ten years in Europe, but such exclusivity period can be reduced to six years if a product no longer meets the criteria for orphan designation or if the product is sufficiently profitable so that market exclusivity is no longer justified.

Even if Oncternal obtains orphan drug exclusivity for a product, that exclusivity may not effectively protect the product from competition because different drugs can be approved for the same condition. Even after an orphan drug is approved, the FDA or comparable foreign regulatory authority can subsequently approve the same drug for the same condition if such regulatory authority concludes that the later drug is clinically superior if it is shown to be safer, more effective or makes a major contribution to patient care. Orphan drug designation neither shortens the development time or regulatory review time of a drug nor gives the drug any advantage in the regulatory review or approval process.

Oncternal may conduct certain of or portions of its clinical trials for its product candidates outside of the United States and the FDA may not accept data from such trials, in which case Oncternal's development plans will be delayed, which could materially harm its business.

Oncternal may in the future choose to conduct one or more of its clinical trials or a portion of its clinical trials for its product candidates outside the United States. Although the FDA may accept data from clinical trials conducted outside the United States, acceptance of this data is subject to certain conditions imposed by the FDA. For example, the clinical trial must be well designed and conducted and performed by qualified investigators in accordance with GCP requirements, and, and FDA must be able to validate the data from the study through an onsite inspection, if required. In general, the patient population for any clinical studies conducted outside of the United States must be representative of the population for whom Oncternal intends to label the product in the United States. In addition, while these clinical trials are subject to the applicable local laws, FDA acceptance of the data will be dependent upon its determination that the studies also complied with all applicable U.S. laws and regulations. There can be no assurance the FDA will accept data from trial conducted outside of the United States. If the FDA does not accept the data from Oncternal's clinical trials of its product candidates, it would likely result in the need for additional trials, which would be costly and time consuming and delay or permanently halt Oncternal's development of its product candidates.

Interim, topline and preliminary data from Oncternal's clinical trials that Oncternal announces or publishes from time to time may change as more patient data become available and are subject to audit and verification procedures that could result in material changes in the final data.

From time to time, Oncternal may publicly disclose preliminary or topline data from Oncternal's clinical studies, which are based on preliminary analyses of then-available data. Such preliminary results and related findings and conclusions are subject to change following more comprehensive reviews of the data related to the particular study or trial. Oncternal also makes assumptions, estimations, calculations and conclusions as part of its analyses of data, and Oncternal may not have received or had the opportunity to fully and carefully evaluate all data. As a result, the topline results that Oncternal reports may differ from future results of the same studies, or different conclusions or considerations may qualify such results once additional data have been received and fully evaluated. Topline data also remain subject to audit and verification procedures that may result in the final data being materially different from the preliminary data Oncternal previously published. As a result, topline data should be viewed with caution until the final data are available. From time to time, Oncternal may also disclose interim data from its clinical studies. Interim data from clinical trials that Oncternal may complete are subject to the risk that one or more of the clinical outcomes may materially change as patient enrollment continues, following more comprehensive reviews of the data, and as more patient data become available. Adverse differences between preliminary or interim data and final data could significantly harm Oncternal's business prospects.

Further, others, including regulatory agencies, may not accept or agree with Oncternal's assumptions, estimates, calculations, conclusions or analyses of data from preclinical studies or clinical trials of its product candidates, or may interpret or weigh the importance of data differently, which could impact the value of the particular product candidate, the approvability or prospects for commercialization of the product candidate, or Oncternal, as a company, in general. In addition, the information Oncternal chooses to publicly disclose regarding a particular study or clinical trial is based on what is typically extensive information, and stockholders and others may not agree with what Oncternal determines is the material or otherwise appropriate information to include in its disclosure. Information that Oncternal decides not to disclose may ultimately be deemed significant with respect to future decisions, conclusions, views, activities or otherwise regarding a particular product, product candidate or Oncternal's business. If the interim, topline or preliminary data that Oncternal discloses differ from actual results, or if others, including regulatory authorities, disagree with the conclusions reached by Oncternal based on its analyses of such data, Oncternal's ability to obtain approval for, and commercialize its product candidates may be harmed, which could harm Oncternal's business, operating results, prospects or financial condition.

Any breakthrough therapy designation that Oncternal may receive from the FDA for its product candidates may not lead to a faster development or regulatory review or approval process, and it does not increase the likelihood that its product candidates will receive marketing approval.

Oncternal may seek breakthrough therapy designation for some of its product candidates, including cirmtuzumab and TK216. A breakthrough therapy is defined as a drug that is intended, alone or in combination with one or more other drugs, to treat a serious or life-threatening disease or condition, and preliminary clinical evidence indicates that the drug may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints. For drugs that have been designated as breakthrough therapies, interaction and communication between the FDA and the sponsor of the trial can help to identify the most efficient path for clinical development while minimizing the number of patients placed in ineffective control regimens. Drugs designated as breakthrough therapies by the FDA are also eligible for accelerated approval. Designation as a breakthrough therapy is within the discretion of the FDA. Accordingly, even if Oncternal believes one of its product candidates meets the criteria for designation as a breakthrough therapy, the FDA may disagree and instead determine not to make such designation. The availability of breakthrough therapy designation was established with the passage of the Food and Drug Administration Safety and Innovation Act of 2012. Oncternal cannot be sure that any evaluation it may make of its product candidates as qualifying for breakthrough therapy designation will meet the FDA's expectations. In any event, the receipt of a breakthrough therapy designation for a product candidate may not result in a faster development process, review or approval compared to drugs considered for approval under conventional FDA procedures and does not assure ultimate approval by the FDA. In addition, even if one or more of Oncternal's product candidates qualify as breakthrough therapies, the FDA may later decide that such product candidates no longer meet the conditions for qualification or decide that the time period for FDA review or approval will not be shortened.

Risks Related to Oncternal's Reliance on Third Parties

Oncternal relies on third parties to conduct many of its preclinical studies and clinical trials. Any failure by a third-party to conduct the clinical trials according to GLPs, GCPs and other requirements and in a timely manner may delay or prevent Oncternal's ability to seek or obtain regulatory approval for or commercialize its product candidates.

Oncternal is dependent on third parties to conduct its clinical trials and preclinical studies, including Oncternal's ongoing clinical trials for cirmtuzumab and TK216 and preclinical studies for ROR1 CAR-T and Oncternal's other development programs. Specifically, Oncternal has used and relied on, and intends to continue to use and rely on, medical institutions, clinical investigators, CROs and consultants to conduct Oncternal's clinical trials in accordance with Oncternal's clinical protocols and applicable regulatory requirements. These CROs, investigators and other third parties play a significant role in the conduct and timing of these trials and subsequent collection and analysis of data. While Oncternal has agreements governing the activities of its third-party contractors, Oncternal has limited influence over their actual performance. Nevertheless, Oncternal is responsible for ensuring that each of its clinical trials is conducted in accordance with the applicable protocol and legal, regulatory and scientific standards, and Oncternal's reliance on the CROs and other third parties does not relieve Oncternal of its regulatory responsibilities. Oncternal and its CROs are required to comply with GCP requirements, which are regulations and guidelines enforced by the FDA and comparable foreign regulatory authorities for all of Oncternal's product candidates in clinical development. Regulatory authorities enforce these GCPs through periodic inspections of trial sponsors, principal investigators and trial sites. If Oncternal or any of its CROs or trial sites fail to comply with applicable GCPs, the clinical data generated in Oncternal's clinical trials may be deemed unreliable, and the FDA or comparable foreign regulatory authorities may require Oncternal to perform additional clinical trials before approving Oncternal's marketing applications. In addition, Oncternal's clinical trials must be conducted with product produced under cGMP regulations. Oncternal's failure to comply with these regulations may require Oncternal to repeat clinical trials, which would delay the regulatory approval process.

There is no guarantee that any such CROs, investigators or other third parties will devote adequate time and resources to such trials or perform as contractually required. If any of these third parties fail to meet expected

deadlines, adhere to Oncternal's clinical protocols or meet regulatory requirements, or otherwise performs in a substandard manner, Oncternal's clinical trials may be extended, delayed or terminated. In addition, many of the third parties with whom Oncternal contracts may also have relationships with other commercial entities, including Oncternal's competitors, for whom they may also be conducting clinical trials or other drug development activities that could harm Oncternal's competitive position. In addition, principal investigators for Oncternal's clinical trials may serve as scientific advisors or consultants to Oncternal from time to time and may receive cash or equity compensation in connection with such services. If these relationships and any related compensation result in perceived or actual conflicts of interest, or the FDA concludes that the financial relationship may have affected the interpretation of the study, the integrity of the data generated at the applicable clinical trial site may be questioned and the utility of the clinical trial itself may be jeopardized, which could result in the delay or rejection of any BLA or NDA Oncternal submits to the FDA. Any such delay or rejection could prevent Oncternal from commercializing its product candidates.

If any of Oncternal's relationships with these third parties terminate, Oncternal may not be able to enter into arrangements with alternative third parties or do so on commercially reasonable terms. Switching or adding additional CROs, investigators and other third parties involves additional cost and requires management time and focus. In addition, there is a natural transition period when a new CRO commences work. As a result, delays may occur, which can materially impact Oncternal's ability to meet its desired clinical development timelines. Though Oncternal carefully manages its relationships with its CROs, investigators and other third parties, there can be no assurance that Oncternal will not encounter challenges or delays in the future or that these delays or challenges will not have a material adverse impact on Oncternal's business, financial condition and prospects.

Oncternal relies on third parties for the manufacture of its product candidates for clinical and preclinical development and expects to continue to do so for the foreseeable future. This reliance on third parties increases the risk that Oncternal will not have sufficient quantities of its product candidates or products or such quantities at an acceptable cost, which could delay, prevent or impair Oncternal's development or commercialization efforts.

Oncternal does not own or operate manufacturing facilities and has no plans to build its own clinical or commercial scale manufacturing capabilities. Oncternal relies, and expects to continue to rely, on third parties for the manufacture of its product candidates and related raw materials for clinical and preclinical development, as well as for commercial manufacture if any of Oncternal's product candidates receive marketing approval. The facilities used by third-party manufacturers to manufacture Oncternal's product candidates must be approved by the FDA or other regulatory agencies pursuant to inspections that will be conducted after Oncternal submits a BLA or an NDA to the FDA or their equivalent to other regulatory agencies. Oncternal does not control the manufacturing process of, and is completely dependent on, third-party manufacturers for compliance with cGMP requirements for manufacture of its drug products. If these third-party manufacturers cannot successfully manufacture material that conforms to Oncternal's specifications and the strict regulatory requirements of the FDA or others, including requirements related to the manufacturing of high potency and pure compounds or other products, they will not be able to secure and/or maintain regulatory approval for their manufacturing facilities. In addition, Oncternal has no control over the ability of third-party manufacturers to maintain adequate quality control, quality assurance and qualified personnel. If the FDA or a comparable foreign regulatory authority does not approve these facilities for the manufacture of Oncternal's product candidates, or if regulatory authorities withdraw any such approval in the future, Oncternal may need to find alternative manufacturing facilities, which would significantly impact Oncternal's ability to develop, obtain regulatory approval for or market its product candidates, if approved. Oncternal's failure, or the failure of its third-party manufacturers, to comply with applicable regulations could result in sanctions being imposed on Oncternal, including clinical holds, fines, injunctions, civil penalties, delays, suspension or withdrawal of approvals, seizures or recalls of product candidates or products, operating restrictions and criminal prosecutions, any of which could significantly and adversely affect supplies of Oncternal's products.

Oncternal's or a third-party's failure to execute on Oncternal's manufacturing requirements, to do so on commercially reasonable terms, or to comply with cGMP could adversely affect Oncternal's business in a number of ways, including:

- an inability to initiate or continue clinical trials of cirmtuzumab, TK216 or any future product candidates under development;
- delay in submitting regulatory applications, or receiving marketing approvals, for Oncternal's product candidates;
- subjecting third-party manufacturing facilities to additional inspections by regulatory authorities;
- requirements to cease development or to recall batches of Oncternal's product candidates; and
- in the event of approval to market and commercialize Oncternal's product candidates, an inability to meet commercial demands for Oncternal's product candidates.

In addition, Oncternal may be unable to establish any agreements with third-party manufacturers or to do so on acceptable terms. Even if Oncternal is able to establish agreements with third-party manufacturers, reliance on third-party manufacturers entails additional risks, including:

- failure of third-party manufacturers to comply with regulatory requirements and maintain quality assurance;
- breach of the manufacturing agreement by the third-party;
- failure to manufacture Oncternal's product according to Oncternal's specifications;
- failure to manufacture Oncternal's product according to Oncternal's schedule, or at all;
- misappropriation of Oncternal's proprietary information, including Oncternal's trade secrets and know-how; and
- termination or nonrenewal of the agreement by the third-party at a time that is costly or inconvenient for Oncternal.

Oncternal's product candidates and any products that Oncternal may develop may compete with other product candidates and products for access to manufacturing facilities. There are a limited number of manufacturers that operate under cGMP regulations and that might be capable of manufacturing for Oncternal.

Any performance failure on the part of Oncternal's existing or future manufacturers could delay clinical development or marketing approval, and any related remedial measures may be costly or time consuming to implement. Oncternal does not currently have arrangements in place for redundant supply or a second source for all required raw materials used in the manufacture of Oncternal's product candidates. If Oncternal's current third-party manufacturers cannot perform as agreed, Oncternal may be required to replace such manufacturers and Oncternal may be unable to replace them on a timely basis or at all.

Oncternal's current and anticipated future dependence upon others for the manufacture of Oncternal's product candidates or products may adversely affect Oncternal's future profit margins and Oncternal's ability to commercialize any products that receive marketing approval on a timely and competitive basis.

Oncternal relies on a third party for the supply of ibrutinib in connection with its ongoing Phase 1b/2 clinical trial. If there are any delays in obtaining sufficient quantities of ibrutinib or if the costs of supplying ibrutinib materially increase, Oncternal's Phase 1b/2 clinical trial could be delayed.

Oncternal relies on a third party for the supply of ibrutinib in connection with its ongoing Phase 1b/2 clinical trial. In April 2018, Oncternal entered into a clinical trial and supply agreement in support of a clinical trial to

evaluate the combination of cirmtuzumab with ibrutinib, an inhibitor of Bruton's tyrosine kinase ("BTK"), a key component of cell signaling in B-cells. Oncternal initiated a Phase 1b/2 clinical trial in May 2018 to assess cirmtuzumab in combination with ibrutinib in patients with CLL and MCL. Pursuant to the agreement, the third party has supplied ibrutinib up to a maximum aggregate amount for part 1 (a dose-finding arm) and part 2 (dose expansion arm) of the ongoing Phase 1b/2 clinical trial evaluating cirmtuzumab in combination with ibrutinib. Under the clinical trial and supply agreement, Oncternal is required to provide periodic reports, including safety data reports, and collaborate with the clinical supplier in relation to any interactions with regulatory authorities regarding ibrutinib, but the agreement includes no upfront costs, milestone or royalty payment commitments. In the event the agreement is terminated, Oncternal would likely incur substantial additional costs in order to obtain and purchase ibrutinib from a source other than Oncertnal's current supplier and the Phase 1b/2 clinical trial may be delayed.

Oncternal's reliance on third parties requires Oncternal to share its trade secrets, which increases the possibility that Oncternal's trade secrets will be misappropriated or disclosed.

Because Oncternal currently relies on third parties to manufacture its product candidates and to perform quality testing, Oncternal must, at times, share its proprietary technology and confidential information, including trade secrets, with them. Oncternal seeks to protect its proprietary technology, in part, by entering into confidentiality agreements, consulting agreements or other similar agreements with its advisors, employees, consultants and contractors prior to beginning research or disclosing proprietary information. These agreements typically limit the rights of the third parties to use or disclose Oncternal's confidential information. Despite the contractual provisions employed when working with third parties, the need to share trade secrets and other confidential information increases the risk that such trade secrets become known by Oncternal's competitors, are intentionally or inadvertently incorporated into the technology of others or are disclosed or used in violation of these agreements. Given that Oncternal's proprietary position is based, in part, on Oncternal's know-how and trade secrets and despite Oncternal's efforts to protect its trade secrets, a competitor's discovery of Oncternal's proprietary technology and confidential information or other unauthorized use or disclosure would impair Oncternal's competitive position and may have a material adverse effect on Oncternal's business, financial condition, results of operations and prospects.

Oncternal may seek to enter into collaborations, licenses and other similar arrangements and may not be successful in doing so, and even if Oncternal is, it may not realize the benefits of such relationships.

Oncternal may seek to enter into collaborations, joint ventures, licenses and other similar arrangements for the development or commercialization of Oncternal's product candidates, due to capital costs required to develop or commercialize the product candidate or manufacturing constraints, in addition to our collaboration with SPH and SPH USA. Oncternal may not be successful in its efforts to establish such collaborations for Oncternal's product candidates because its research and development pipeline may be insufficient, its product candidates may be deemed to be at too early of a stage of development for collaborative effort or third parties may not view Oncternal's product candidates as having the requisite potential to demonstrate safety and efficacy or significant commercial opportunity. In addition, Oncternal faces significant competition in seeking appropriate strategic partners, and the negotiation process can be time consuming and complex. Further, any future collaboration agreements may restrict Oncternal from entering into additional agreements with potential collaborators. Oncternal cannot be certain that, following a strategic transaction or license, Oncternal will achieve an economic benefit that justifies such transaction.

Even if Oncternal is successful in its efforts to establish such collaborations, the terms that Oncternal agrees upon may not be favorable to Oncternal, and Oncternal may not be able to maintain such collaborations if, for example, development or approval of a product candidate is delayed, the safety of a product candidate is questioned or sales of an approved product candidate are unsatisfactory.

In addition, any potential future collaborations may be terminable by Oncternal's strategic partners, and Oncternal may not be able to adequately protect its rights under these agreements. Furthermore, strategic partners

may negotiate for certain rights to control decisions regarding the development and commercialization of Oncternal's product candidates, if approved, and may not conduct those activities in the same manner as Oncternal would. Any termination of collaborations Oncternal enters into in the future, or any delay in entering into collaborations related to Oncternal's product candidates, could delay the development and commercialization of Oncternal's product candidates and reduce their competitiveness if they reach the market, which could have a material adverse effect on Oncternal's business, financial condition and results of operations.

Risks Related to Commercialization of Oncternal's Product Candidates

Even if Oncternal receives regulatory approval for any product candidate, Oncternal will be subject to ongoing regulatory obligations and continued regulatory review, which may result in significant additional expense. Additionally, Oncternal's product candidates, if approved, could be subject to labeling and other restrictions on marketing or withdrawal from the market, and Oncternal may be subject to penalties if Oncternal fails to comply with regulatory requirements or if Oncternal experiences unanticipated problems with its product candidates, when and if any of them are approved.

Following potential approval of any of Oncternal's product candidates, the FDA may impose significant restrictions on a product's indicated uses or marketing or impose ongoing requirements for potentially costly and time consuming post-approval studies, post-market surveillance or clinical trials to monitor the safety and efficacy of the product. The FDA may also require a REMS as a condition of approval of Oncternal's product candidates, which could include requirements for a medication guide, physician communication plans or additional elements to ensure safe use, such as restricted distribution methods, patient registries and other risk minimization tools. In addition, if the FDA or a comparable foreign regulatory authority approves Oncternal's product candidates, the manufacturing processes, labeling, packaging, distribution, adverse event reporting, storage, advertising, promotion, import, export and recordkeeping for Oncternal's products will be subject to extensive and ongoing regulatory requirements. These requirements include submissions of safety and other post-marketing information and reports, registration, as well as continued compliance with cGMPs and GCP requirements for any clinical trials that Oncternal conducts post-approval. Later discovery of previously unknown problems with Oncternal's products, including adverse events of unanticipated type, severity or frequency, or with Oncternal's third-party manufacturers or manufacturing processes, or failure to comply with regulatory requirements, may result in, among other things:

- restrictions on the marketing or manufacturing of Oncternal's products, withdrawal of the product from the market or voluntary or mandatory product recalls;
- restrictions on product distribution or use, or requirements to conduct post-marketing studies or clinical trials;
- fines, restitutions, disgorgement of profits or revenues, warning letters, untitled letters or holds on clinical trials;
- refusal by the FDA to approve pending applications or supplements to approved applications filed by Oncternal or suspension or revocation of approvals;
- product seizure or detention, or refusal to permit the import or export of Oncternal's products; and
- injunctions or the imposition of civil or criminal penalties.

The occurrence of any event or penalty described above may inhibit Oncternal's ability to commercialize its product candidates and generate revenue and could require Oncternal to expend significant time and resources in response and could generate negative publicity.

In addition, if any of Oncternal's product candidates is approved, Oncternal's product labeling, advertising and promotion will be subject to regulatory requirements and continuing regulatory review. The FDA strictly regulates the promotional claims that may be made about drug products. In particular, a product may not be

promoted for uses that are not approved by the FDA as reflected in the product's approved labeling. If Oncternal receives marketing approval for a product candidate, physicians may nevertheless prescribe it to their patients in a manner that is inconsistent with the approved label. If Oncternal is found to have promoted such off-label uses, Oncternal may become subject to significant liability. The FDA and other agencies actively enforce the laws and regulations prohibiting the promotion of off-label uses, and a company that is found to have improperly promoted off-label uses may be subject to significant sanctions. The federal government has levied large civil and criminal fines against companies for alleged improper promotion and has enjoined several companies from engaging in off-label promotion. The FDA has also requested that companies enter into consent decrees or permanent injunctions under which specified promotional conduct is changed or curtailed.

The FDA and other regulatory authorities' policies may change and additional government regulations may be enacted that could prevent, limit or delay regulatory approval of Oncternal's product candidates. If Oncternal is slow or unable to adapt to changes in existing requirements or the adoption of new requirements or policies, or if Oncternal is not able to maintain regulatory compliance, Oncternal may lose any marketing approval that Oncternal may have obtained and Oncternal may not achieve or sustain profitability.

Oncternal also cannot predict the likelihood, nature or extent of government regulation that may arise from future legislation or administrative or executive action, either in the United States or abroad. For example, certain policies of the current U.S. administration may impact Oncternal's business and industry. Namely, the current U.S. administration has taken several executive actions, including the issuance of a number of Executive Orders, that could impose significant burdens on, or otherwise materially delay, the FDA's ability to engage in routine regulatory and oversight activities such as implementing statutes through rulemaking, issuance of guidance, and review and approval of marketing applications. It is difficult to predict how these executive actions, including any Executive Orders, will be implemented, and the extent to which they will impact the FDA's ability to exercise its regulatory authority. If these executive actions impose constraints on the FDA's ability to engage in oversight and implementation activities in the normal course, Oncternal's business may be negatively impacted.

If Oncternal is slow or unable to adapt to changes in existing requirements or the adoption of new requirements or policies, or if Oncternal is not able to maintain regulatory compliance, Oncternal may lose any marketing approval that Oncternal may have obtained and Oncternal may not achieve or sustain profitability, which would adversely affect Oncternal's business, prospects, financial condition and results of operations.

Changes in funding for the FDA and other government agencies could hinder their ability to hire and retain key leadership and other personnel, or otherwise prevent new products and services from being developed or commercialized in a timely manner, which could negatively impact Oncternal's business.

The ability of the FDA and other regulatory agencies to review and approve new products can be affected by a variety of factors, including government budget and funding levels, ability to hire and retain key personnel and accept the payment of user fees, and statutory, regulatory, and policy changes. Average review times at the agency have fluctuated in recent years as a result. In addition, government funding of other government agencies that fund research and development activities is subject to the political process, which is inherently fluid and unpredictable.

Disruptions at the FDA and other agencies may also slow the time necessary for new drugs and biologics to be reviewed and/or approved by necessary government agencies, which would adversely affect Oncternal's business. For example, over the last several years, including for 35 days beginning on December 22, 2018, the U.S. government has shut down several times and certain regulatory agencies, such as the FDA, have had to furlough critical FDA employees and stop critical activities. If a prolonged government shutdown occurs, it could significantly impact the ability of the FDA to timely review and process Oncternal's regulatory submissions, which could have a material adverse effect on its business.

The commercial success of Oncternal's product candidates will depend upon the degree of market acceptance of such product candidates by physicians, patients, healthcare payors and others in the medical community.

Oncternal's product candidates may not be commercially successful. Even if any of Oncternal's product candidates receive regulatory approval, they may not gain market acceptance among physicians, patients, healthcare payors or the medical community. The commercial success of any of Oncternal's current or future product candidates will depend significantly on the broad adoption and use of the resulting product by physicians and patients for approved indications. The degree of market acceptance of Oncternal's products will depend on a number of factors, including:

- demonstration of clinical efficacy and safety compared to other more-established products;
- the indications for which Oncternal's product candidates are approved;
- the limitation of Oncternal's targeted patient population and other limitations or warnings contained in any FDA-approved labeling;
- acceptance of a new drug for the relevant indication by healthcare providers and their patients;
- the pricing and cost-effectiveness of Oncternal's products, as well as the cost of treatment with Oncternal's products in relation to alternative treatments and therapies;
- Oncternal's ability to obtain and maintain sufficient third-party coverage and adequate reimbursement from government healthcare programs, including Medicare and Medicaid, private health insurers and other third-party payors;
- the willingness of patients to pay all, or a portion of, out-of-pocket costs associated with Oncternal's products in the absence of sufficient third-party coverage and adequate reimbursement;
- any restrictions on the use of Oncternal's products, and the prevalence and severity of any adverse effects;
- potential product liability claims;
- the timing of market introduction of Oncternal's products as well as competitive drugs;
- the effectiveness of Oncternal's or any of its potential future collaborators' sales and marketing strategies; and
- unfavorable publicity relating to the product.

If any product candidate is approved but does not achieve an adequate level of acceptance by physicians, hospitals, healthcare payors or patients, Oncternal may not generate sufficient revenue from that product and may not become or remain profitable. Oncternal's efforts to educate the medical community and third-party payors regarding the benefits of Oncternal's products may require significant resources and may never be successful.

The market opportunities for Oncternal's product candidates may be limited to patients who are ineligible for or have failed prior treatments and may be small or different from Oncternal's estimates.

Cancer therapies are sometimes characterized as first line, second line or third line, and the FDA often approves new therapies initially only for third line use. When cancer is detected early enough, first line therapy is sometimes adequate to cure the cancer or prolong life without a cure. Whenever first line therapy, including targeted therapy, immunotherapy, chemotherapy, hormone therapy, surgery or a combination of these, proves unsuccessful, second line therapy may be administered. Second line therapies often consist of more chemotherapy, radiation, antibody drugs, tumor targeted small molecules or a combination of these. Third line therapies can include bone marrow transplantation, antibody and small molecule targeted therapies, more invasive forms of surgery and new technologies. In markets with approved therapies, there is no guarantee that Oncternal's product candidates, even if approved, would be approved for second line or first line therapy. This could limit Oncternal's potential market opportunity. In addition, Oncternal may have to conduct additional clinical trials prior to gaining approval for second line or first line therapy.

Oncternal's projections of both the number of people who have the cancers it is targeting, as well as the subset of people with these cancers in a position to receive later stage therapy and who have the potential to benefit from treatment with its product candidates, are based on Oncternal's beliefs and estimates. These estimates have been derived from a variety of sources, including scientific literature, surveys of clinics, patient foundations or market research and may prove to be incorrect. Further, new studies may change the estimated incidence or prevalence of these cancers. The number of patients may turn out to be lower than expected. In addition, the potentially addressable patient population for Oncternal's product candidates may be limited or may not be amenable to treatment with its product candidates. Even if Oncternal obtains significant market share for its product candidates, it may never achieve profitability without obtaining regulatory approval for additional indications, including use as a first or second line therapy.

Any product candidates for which Oncternal intends to seek approval as biologic products may face competition sooner than anticipated.

The Affordable Care Act includes a subtitle called the Biologics Price Competition and Innovation Act of 2009 ("BPCIA"), which created an abbreviated approval pathway for biological products that are biosimilar to or interchangeable with an FDA-licensed reference biological product. Under the BPCIA, an application for a biosimilar product may not be submitted to the FDA until four years following the date that the reference product was first licensed by the FDA. In addition, the approval of a biosimilar product may not be made effective by the FDA until 12 years from the date on which the reference product was first licensed. During this 12-year period of exclusivity, another company may still market a competing version of the reference product if the FDA approves a full BLA for the competing product containing the sponsor's own preclinical data and data from adequate and well-controlled clinical trials to demonstrate the safety, purity and potency of its product. The law is complex and is still being interpreted and implemented by the FDA. As a result, its ultimate impact, implementation and meaning are subject to uncertainty, and any processes adopted by the FDA to implement the BPCIA could have a material adverse effect on the future commercial prospects for Oncternal's biological products.

Oncternal believes that any of its future product candidates approved as a biological product under a BLA should qualify for the 12-year period of exclusivity. However, there is a risk that this exclusivity could be shortened due to Congressional action or otherwise, or that the FDA will not consider Oncternal's product candidates to be reference products for competing products, potentially creating the opportunity for generic competition sooner than anticipated. Other aspects of the BPCIA, some of which may impact the BPCIA exclusivity provisions, have also been the subject of recent litigation. Moreover, the extent to which a biosimilar, once approved, could be substituted for any one of our reference products in a way that is similar to traditional generic substitution for non-biological products will depend on a number of marketplace and regulatory factors that are still developing.

The FDA and other regulatory agencies actively enforce the laws and regulations prohibiting the promotion of off-label uses. If Oncternal is found or alleged to have improperly promoted off-label uses, Oncternal may become subject to significant liability.

The FDA and other regulatory agencies strictly regulate the promotional claims that may be made about prescription products, as Oncternal's product candidates would be, if approved. In particular, a product may not be promoted for uses that are not approved by the FDA or such other regulatory agencies as reflected in the product's approved labeling. If Oncternal is found to have promoted such off-label uses, it may become subject to significant liability. The federal government has levied large civil and criminal fines against companies for alleged improper promotion and has enjoined several companies from engaging in off-label promotion. The FDA has also requested that companies enter into consent decrees or permanent injunctions under which specified promotional conduct is changed or curtailed. If Oncternal cannot successfully manage the promotion and avoid off-label promotion of its product candidates, if approved, it could become subject to significant liability, which would materially adversely affect Oncternal's business and financial condition.

The successful commercialization of Oncternal's product candidates, if approved, will depend in part on the extent to which governmental authorities and health insurers establish coverage, adequate reimbursement levels and favorable pricing policies. Failure to obtain or maintain coverage and adequate reimbursement for Oncternal's products could limit its ability to market those products and decrease its ability to generate revenue.

The availability of coverage and the adequacy of reimbursement by governmental healthcare programs such as Medicare and Medicaid, private health insurers and other third-party payors are essential for most patients to be able to afford prescription medications such as Oncternal's product candidates, if approved. Oncternal's ability to achieve coverage and acceptable levels of reimbursement for Oncternal's products by third-party payors will have an effect on Oncternal's ability to successfully commercialize those products. Even if Oncternal obtains coverage for a given product by a third-party payor, the resulting reimbursement payment rates may not be adequate or may require co-payments that patients find unacceptably high. Oncternal cannot be sure that coverage and reimbursement in the United States, the European Union or elsewhere will be available for any product that Oncternal may develop, and any reimbursement that may become available may be decreased or eliminated in the future.

Third-party payors increasingly are challenging prices charged for pharmaceutical products and services, and many third-party payors may refuse to provide coverage and reimbursement for particular drugs when an equivalent generic drug or a less expensive therapy is available. It is possible that a third-party payor may consider Oncternal's products as substitutable and only offer to reimburse patients for the less expensive product. Even if Oncternal is successful in demonstrating improved efficacy or improved convenience of administration with Oncternal's products, pricing of existing drugs may limit the amount Oncternal will be able to charge for its products. These payors may deny or revoke the reimbursement status of a given product or establish prices for new or existing marketed products at levels that are too low to enable Oncternal to realize an appropriate return on its investment in product development. If reimbursement is not available or is available only at limited levels, Oncternal may not be able to successfully commercialize its products and may not be able to obtain a satisfactory financial return on products that Oncternal may develop.

There is significant uncertainty related to third-party payor coverage and reimbursement of newly approved products. In the United States, third-party payors, including private and governmental payors, such as the Medicare and Medicaid programs, play an important role in determining the extent to which new drugs will be covered. Some third-party payors may require pre-approval of coverage for new or innovative devices or drug therapies before they will reimburse healthcare providers who use such therapies. It is difficult to predict at this time what third-party payors will decide with respect to the coverage and reimbursement for Oncternal's products.

Obtaining and maintaining reimbursement status is time consuming, costly and uncertain. The Medicare and Medicaid programs increasingly are used as models for how private payors and other governmental payors develop their coverage and reimbursement policies for drugs. However, no uniform policy for coverage and reimbursement for products exists among third-party payors in the United States. Therefore, coverage and reimbursement for products can differ significantly from payor to payor. As a result, the coverage determination process is often a time consuming and costly process that will require Oncternal to provide scientific and clinical support for the use of Oncternal's products to each payor separately, with no assurance that coverage and adequate reimbursement will be applied consistently or obtained in the first instance. Furthermore, rules and regulations regarding reimbursement change frequently, in some cases at short notice, and Oncternal believes that changes in these rules and regulations are likely.

Additionally, Oncternal or its collaborators may develop companion diagnostic tests for use with its product candidates as Oncternal is targeting certain defined populations for its treatments. Oncternal, or its collaborators, will be required to obtain coverage and reimbursement for these tests separate and apart from the coverage and reimbursement sought for its product candidates, once approved. While Oncternal, or its collaborators, has not

yet developed any companion diagnostic test for its product candidates, if it does, there is significant uncertainty regarding Oncternal's ability to obtain approval, coverage and adequate reimbursement for the same reasons applicable to its product candidates.

Outside the United States, international operations are generally subject to extensive governmental price controls and other market regulations, and Oncternal believes the increasing emphasis on cost-containment initiatives in Europe and other countries has and will continue to put pressure on the pricing and usage of Oncternal's products. In many countries, the prices of medical products are subject to varying price control mechanisms as part of national health systems. Other countries allow companies to fix their own prices for medical products but monitor and control company profits. Additional foreign price controls or other changes in pricing regulation could restrict the amount that Oncternal is able to charge for its products. Accordingly, in markets outside the United States, the reimbursement for Oncternal's products may be reduced compared with the United States and may be insufficient to generate commercially reasonable revenue and profits.

Moreover, increasing efforts by governmental and third-party payors in the United States and abroad to cap or reduce healthcare costs may cause such organizations to limit both coverage and the level of reimbursement for newly approved products and, as a result, they may not cover or provide adequate payment for Oncternal's products. Oncternal expects to experience pricing pressures in connection with the sale of any of its products due to the trend toward managed healthcare, the increasing influence of health maintenance organizations and additional legislative changes. The downward pressure on healthcare costs in general, particularly prescription drugs and surgical procedures and other treatments, has become very intense. As a result, increasingly high barriers are being erected to the entry of new products.

Oncternal faces significant competition, and if its competitors develop technologies or product candidates more rapidly than Oncternal does or their technologies are more effective, Oncternal's ability to develop and successfully commercialize products may be adversely affected.

The biotechnology and pharmaceutical industries are characterized by rapidly advancing technologies, intense competition and a strong emphasis on proprietary and novel products and product candidates. Oncternal's competitors have developed, are developing or may develop products, product candidates and processes competitive with Oncternal's product candidates. Any product candidates that Oncternal successfully develops and commercializes will compete with existing therapies and new therapies that may become available in the future. Oncternal believes that a significant number of products are currently under development, and may become commercially available in the future, for the treatment of conditions for which Oncternal may attempt to develop product candidates. In particular, there is intense competition in the fields of immunology, inflammation and oncology. Oncternal's competitors include larger and better funded pharmaceutical, biopharmaceutical, biotechnological and therapeutics companies. Moreover, Oncternal may also compete with universities and other research institutions who may be active in the indications Oncternal is targeting and could be in direct competition with Oncternal. Oncternal also competes with these organizations to recruit management, scientists and clinical development personnel, which could negatively affect its level of expertise and its ability to execute its business plan. Oncternal will also face competition in establishing clinical trial sites, enrolling subjects for clinical trials and in identifying and in-licensing new product candidates. Smaller or early stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large and established companies.

If any of our product candidates are approved in oncology indications such as CLL or MCL, they will compete with small molecule therapies, biologics, cell-based therapies and vaccines, either approved or under development, that are intended to treat the same cancers that Oncternal is targeting, including through approaches that may prove to be more effective, have fewer side effects, be less costly to manufacture, be more convenient to administer or have other advantages over any product candidates Oncternal develops. In addition to competing with other therapies targeting similar indications, there are numerous other companies and academic institutions focused on similar targets as our product candidates and/or different scientific approaches to treating the same

indications. Oncternal faces competition from such companies in seeking any future potential collaborations to partner our product candidates, as well as potentially competing commercially for any approved products.

CLL has traditionally been treated with standard cytotoxic agents such as fludarabine, chlorambucil, cyclophosphamide, and bendamustine. Rituximab, marketed as Rituxan by Genentech, which is a monoclonal antibody that specifically recognizes CD20, an antigen on B-cells from which the tumor cells in CLL arise, was approved for use in CLL in 2010, but was previously widely prescribed off-label. Rituximab, which is typically used to treat patients with CLL in combination with cytotoxic agents, remains a treatment option for younger patients who can tolerate the side effects of the associated chemotherapy. Regulatory authorities have also approved other monoclonal antibody products that target CD20, as well as antibodies targeting another surface protein found on CLL tumor cells known as CD52, and three classes of small molecules: ibrutinib, venetoclax, an inhibitor of the protein B-cell lymphoma-2 ("Bcl-2"), which is marketed as Venclexta and Venclyxto by AbbVie and Roche/Genentech, and idelalisib, an inhibitor of Phosphoinositide 3-kinase ("PI3K"), which is marketed as Zydelig by Gilead Sciences. These agents are approved for use as single agents, but are being investigated in combination with each other and with various monoclonal antibody products. Additionally, clinicians are investigating their potential in earlier stage disease in multiple clinical trials.

There are several therapeutic options available to treat MCL. Newly diagnosed patients are typically treated with rituximab combined with a chemotherapy regimen known as CHOP, comprised of cyclophosphamide, doxorubicin, vincristine, and prednisone. Alternative chemotherapy regimens include bortezomib or bendamustine. Patients with clinical responses to chemotherapy may become candidates for another therapeutic approach, autologous stem cell transplantation, a procedure in which radiation and/or chemotherapy is used to eliminate the patient's immune cells, including residual MCL cells. Recently, ibrutinib was granted accelerated approval by the FDA for the treatment of relapsed MCL.

The current standard therapy for patients with localized Ewing sarcoma in the U.S. is a combination of chemotherapy agents, including vincristine, doxorubicin and cyclophosphamide, with alternating cycles of ifosfamide and etoposide, which is a therapy known as VDC/IE. This may also be supplemented by local radiation therapy or systemic radiation followed by autologous hematopoietic stem cell transplant.

Many of Oncternal's competitors have significantly greater financial, technical, manufacturing, marketing, sales and supply resources or experience than Oncternal does. If Oncternal successfully obtains approval for any product candidate, Oncternal will face competition based on many different factors, including the safety and effectiveness of Oncternal's products, the ease with which Oncternal's products can be administered and the extent to which patients accept relatively new routes of administration, the timing and scope of regulatory approvals for these products, the availability and cost of manufacturing, marketing and sales capabilities, price, reimbursement coverage and patent position. Competing products could present superior treatment alternatives, including by being more effective, safer, more convenient, less expensive or marketed and sold more effectively than any products Oncternal may develop. Competitive products may make any products Oncternal develops obsolete or noncompetitive before Oncternal recovers the expense of developing and commercializing Oncternal's product candidates. If Oncternal is unable to compete effectively, Oncternal's opportunity to generate revenue from the sale of its products it may develop, if approved, could be adversely affected.

If the market opportunities for Oncternal's products are smaller than Oncternal believes they are, Oncternal's revenue may be adversely affected, and its business may suffer.

The precise incidence and prevalence for all the conditions Oncternal aims to address with its product candidates are unknown. Oncternal's projections of both the number of people who have these diseases, the number who have the specific indicated stage or treatment history Oncternal believes will be the approved indication, as well as the subset of people with these diseases who have the potential to benefit from treatment with Oncternal's product candidates, are based on Oncternal's beliefs and estimates. These estimates have been derived from a variety of sources, including the scientific literature, surveys of clinics, patient foundations or market research,

and may prove to be incorrect. Further, new trials may change the estimated incidence or prevalence of these diseases. The total addressable market across all of Oncternal's product candidates will ultimately depend upon, among other things, the indication approved by regulatory agencies and the diagnostic criteria included in the final label for each of Oncternal's product candidates approved for sale for these indications, the availability of alternative treatments and the safety, convenience, cost and efficacy of Oncternal's product candidates relative to such alternative treatments, acceptance by the medical community and patient access, drug pricing and reimbursement. The number of patients in the United States and other major markets and elsewhere may turn out to be lower than expected, patients may not be otherwise amenable to treatment with Oncternal's products or new patients may become increasingly difficult to identify or gain access to, all of which would adversely affect Oncternal's results of operations and its business. Further, even if Oncternal obtains significant market share for its product candidates, because some of Oncternal's potential target populations are very small, Oncternal may never achieve profitability despite obtaining such significant market share.

Oncternal currently has no marketing and sales organization and has no experience as a company in commercializing products, and Oncternal may have to invest significant resources to develop these capabilities. If Oncternal is unable to establish marketing and sales capabilities or enter into agreements with third parties to market and sell its products, Oncternal may not be able to generate product revenue.

Oncternal has no internal sales, marketing or distribution capabilities, nor has it commercialized a product. If any of Oncternal's product candidates ultimately receives regulatory approval, Oncternal must build a marketing and sales organization with technical expertise and supporting distribution capabilities to commercialize each such product in major markets, which will be expensive and time consuming, or collaborate with third parties that have sales forces and established distribution systems, either to augment Oncternal's own sales force and distribution systems or in lieu of Oncternal's own sales force and distribution systems. Oncternal has no prior experience as a company in the marketing, sale and distribution of biopharmaceutical products and there are significant risks involved in building and managing a sales organization, including Oncternal's ability to hire, retain and incentivize qualified individuals, generate sufficient sales leads, provide adequate training to sales and marketing personnel and effectively manage a geographically dispersed sales and marketing team. Any failure or delay in the development of Oncternal's internal sales, marketing and distribution capabilities would adversely impact the commercialization of these products. Oncternal may not be able to enter into collaborations or hire consultants or external service providers to assist Oncternal in sales, marketing and distribution functions on acceptable financial terms, or at all. In addition, Oncternal's product revenues and its profitability, if any, may be lower if Oncternal relies on third parties for these functions than if Oncternal were to market, sell and distribute any products that Oncternal develops itself. Oncternal likely will have little control over such third parties, and any of them may fail to devote the necessary resources and attention to sell and market Oncternal's products effectively. If Oncternal is not successful in commercializing its products, either on its own or through arrangements with one or more third parties, Oncternal may not be able to generate any future product revenue and Oncternal would incur significant additional losses.

Oncternal's future growth may depend, in part, on its ability to operate in foreign markets, where Oncternal would be subject to additional regulatory burdens and other risks and uncertainties.

Oncternal's future growth may depend, in part, on its ability to develop and commercialize its product candidates in foreign markets. Oncternal is not permitted to market or promote any of its product candidates before it receives regulatory approval from applicable regulatory authorities in foreign markets, and Oncternal may never receive such regulatory approvals for any of its product candidates. To obtain separate regulatory approval in most other countries Oncternal must comply with numerous and varying regulatory requirements regarding safety and efficacy and governing, among other things, clinical trials, commercial sales, manufacturing, pricing and distribution of Oncternal's product candidates. If Oncternal receives regulatory approval of its product candidates and ultimately commercialize its products in foreign markets, Oncternal would be subject to additional risks and uncertainties, including:

- different regulatory requirements for approval of drugs in foreign countries;

- reduced protection for intellectual property rights;
- the existence of additional third-party patent rights of potential relevance to Oncternal's business;
- unexpected changes in tariffs, trade barriers and regulatory requirements;
- economic weakness, including inflation, or political instability in particular foreign economies and markets; compliance with tax, employment, immigration and labor laws for employees living or traveling abroad;
- foreign currency fluctuations, which could result in increased operating expenses and reduced revenues, and other obligations incident to doing business in another country;
- foreign reimbursement, pricing and insurance regimes;
- workforce uncertainty in countries where labor unrest is common;
- production shortages resulting from any events affecting raw material supply or manufacturing capabilities abroad; and
- business interruptions resulting from geopolitical actions, including war and terrorism, or natural disasters including earthquakes, typhoons, floods and fires.

Risks Related to Oncternal's Business Operations and Industry

Oncternal's operating results may fluctuate significantly, which makes Oncternal's future operating results difficult to predict and could cause Oncternal's operating results to fall below expectations or any guidance it may provide.

Oncternal's quarterly and annual operating results may fluctuate significantly, which makes it difficult for Oncternal to predict its future operating results. These fluctuations may occur due to a variety of factors, many of which are outside of Oncternal's control, including, but not limited to:

- the timing and cost of, and level of investment in, research, development, regulatory approval and commercialization activities relating to Oncternal's product candidates, which may change from time to time;
- coverage and reimbursement policies with respect to Oncternal's product candidates, if approved, and potential future drugs that compete with Oncternal's products;
- the cost of manufacturing Oncternal's product candidates, which may vary depending on the quantity of production and any manufacturing issues or challenges requiring additional manufacturing activities, and the terms of Oncternal's agreements with third-party manufacturers;
- the timing and amount of any milestone or other payments Oncternal must make to the licensors and other third parties from whom Oncternal has in-licensed or acquired its product candidates;
- expenditures that Oncternal may incur to acquire, develop or commercialize additional product candidates and technologies;
- the level of demand for any approved products, which may vary significantly;
- future accounting pronouncements or changes in Oncternal's accounting policies; and
- the timing and success or failure of preclinical studies or clinical trials for Oncternal's product candidates or competing product candidates, or any other change in the competitive landscape of Oncternal's industry, including consolidation among Oncternal's competitors or partners.

The cumulative effects of these factors could result in large fluctuations and unpredictability in Oncternal's quarterly and annual operating results. As a result, comparing Oncternal's operating results on a period-to-period basis may not be meaningful. Investors should not rely on Oncternal's past results as an indication of its future performance.

This variability and unpredictability could also result in Oncternal's failing to meet the expectations of industry or financial analysts or investors for any period. If Oncternal's revenue or operating results fall below the expectations of analysts or investors or below any forecasts Oncternal may provide to the market, or if the forecasts Oncternal provides to the market are below the expectations of analysts or investors, the price of Oncternal's common stock could decline substantially. Such a stock price decline could occur even when Oncternal has met any previously publicly stated revenue or earnings guidance Oncternal may provide.

Oncternal is dependent on the services of its management and if it is not able to retain these individuals or recruit additional management or other key personnel, Oncternal's business will suffer.

Oncternal's success depends in part on its continued ability to attract, retain and motivate highly qualified management, clinical and scientific personnel. Oncternal is highly dependent upon its senior management, particularly its Chief Executive Officer, as well as other members of its senior management team. The loss of services of any of these individuals could delay or prevent the successful development of Oncternal's product pipeline, initiation or completion of Oncternal's planned operations, planned clinical trials or the commercialization of Oncternal's product candidates. Although Oncternal has executed employment agreements or offer letters with each member of its senior management team, these agreements are terminable at will with or without notice and, therefore, Oncternal may not be able to retain their services as expected. Oncternal does not currently maintain "key person" life insurance on the lives of any of its employees. This lack of insurance means that Oncternal may not have adequate compensation for the loss of the services of these individuals.

Oncternal will need to expand and effectively manage its managerial, operational, financial and other resources in order to successfully pursue its clinical development and commercialization efforts. Oncternal may not be successful in maintaining its unique company culture and continuing to attract or retain qualified management and scientific and clinical personnel in the future due to the intense competition for qualified personnel among pharmaceutical, biotechnology and other businesses, particularly in the San Diego area. Oncternal's industry has experienced a high rate of turnover of management personnel in recent years. If Oncternal is not able to attract, integrate, retain and motivate necessary personnel to accomplish its business objectives, Oncternal may experience constraints that will significantly impede the achievement of its development objectives, its ability to raise additional capital and its ability to implement its business strategy.

Oncternal may encounter difficulties in managing its growth and expanding its operations successfully.

As of March 31, 2019, Oncternal had five full-time employees and three part-time employees. As Oncternal continues research and development activities and pursues the potential commercialization of its product candidates, as well as function as a public company, Oncternal will need to expand its financial, research, development, regulatory, manufacturing, marketing and sales capabilities or contract with third parties to provide these capabilities for the company. As Oncternal's operations expand, it expects that it will need to manage additional relationships with various strategic partners, suppliers and other third parties. Oncternal's future financial performance and its ability to develop and commercialize its product candidates and to compete effectively will depend, in part, on its ability to manage any future growth effectively.

Oncternal is subject to various foreign, federal, and state healthcare and privacy laws and regulations, and Oncternal's failure to comply with these laws and regulations could harm its results of operations and financial condition.

Oncternal's business operations and current and future arrangements with investigators, healthcare professionals, consultants, third-party payors and customers expose Oncternal to broadly applicable foreign, federal and state fraud and abuse and other healthcare and privacy laws and regulations. These laws may constrain the business or financial arrangements and relationships through which Oncternal conducts its operations, including how

Oncternal researches, markets, sells and distributes any products for which it obtains marketing approval. Such laws include:

- the federal Anti-Kickback Statute, which prohibits, among other things, persons or entities from knowingly and willfully soliciting, offering, receiving or providing any remuneration (including any kickback, bribe or certain rebates), directly or indirectly, overtly or covertly, in cash or in kind, in return for, either the referral of an individual or the purchase, lease, or order, or arranging for or recommending the purchase, lease, or order of any good, facility, item or service, for which payment may be made, in whole or in part, under a federal healthcare program such as Medicare and Medicaid. A person or entity does not need to have actual knowledge of the federal Anti- Kickback Statute or specific intent to violate it in order to have committed a violation. In addition, the government may assert that a claim including items or services resulting from a violation of the federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the civil False Claims Act;
- the federal false claims and civil monetary penalties laws, including the civil False Claims Act, which prohibits, among other things, individuals or entities from knowingly presenting, or causing to be presented, to the federal government, claims for payment or approval that are false or fraudulent, knowingly making, using or causing to be made or used, a false record or statement material to a false or fraudulent claim, or from knowingly making or causing to be made a false statement to avoid, decrease or conceal an obligation to pay money to the federal government;
- the federal Health Insurance Portability and Accountability Act of 1996 (“HIPAA”), which imposes criminal and civil liability for, among other things, knowingly and willfully executing, or attempting to execute, a scheme to defraud any healthcare benefit program, or knowingly and willfully falsifying, concealing or covering up a material fact or making any materially false statement, in connection with the delivery of, or payment for, healthcare benefits, items or services. Similar to the federal Anti-Kickback Statute, a person or entity does not need to have actual knowledge of the statute or specific intent to violate it in order to have committed a violation;
- HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act of 2009 (“HITECH”), and their implementing regulations, also impose obligations, including mandatory contractual terms, with respect to safeguarding the privacy, security and transmission of individually identifiable health information without appropriate authorization by covered entities subject to the rule, such as health plans, healthcare clearinghouses and certain healthcare providers as well as their business associates that perform certain services for or on their behalf involving the use or disclosure of individually identifiable health information;
- the federal Physician Payments Sunshine Act, which requires certain manufacturers of drugs, devices, biologics and medical supplies for which payment is available under Medicare, Medicaid or the Children’s Health Insurance Program (with certain exceptions) to report annually to the Centers for Medicare and Medicaid Services (“CMS”), information related to payments and other “transfers of value” made to physicians (defined to include doctors, dentists, optometrists, podiatrists and chiropractors) and teaching hospitals, as well as ownership and investment interests held by the physicians described above and their immediate family members;
- federal consumer protection and unfair competition laws, which broadly regulate marketplace activities and activities that potentially harm consumers; and
- analogous state and foreign laws and regulations, such as state anti-kickback and false claims laws, which may apply to Oncternal’s business practices, including but not limited to, research, distribution, sales and marketing arrangements and claims involving healthcare items or services reimbursed by non- governmental third-party payors, including private insurers, or by the patients themselves; state laws that require pharmaceutical companies to comply with the pharmaceutical industry’s voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government, or otherwise restrict payments that may be made to healthcare providers and other potential referral

sources; state laws and regulations that require drug manufacturers to file reports relating to pricing and marketing information or which require tracking gifts and other remuneration and items of value provided to physicians, other healthcare providers and entities; state and local laws that require the registration of pharmaceutical sales representatives; state and foreign laws governing the privacy and security of health information in some circumstances, many of which differ from each other in significant ways and often are not preempted by HIPAA; state and foreign governments that have enacted or proposed requirements regarding the collection, distribution, use, security, and storage of personally identifiable information and other data relating to individuals (including the EU General Data Protection Regulation 2016/679 ("GDPR"), and the California Consumer Protection Act ("CCPA")), and federal and state consumer protection laws are being applied to enforce regulations related to the online collection, use, and dissemination of data, thus complicating compliance efforts.

As of May 25, 2018, the GDPR replaced the Data Protection Directive with respect to the processing of personal data in the European Union. The GDPR imposes many requirements for controllers and processors of personal data, including, for example, higher standards for obtaining consent from individuals to process their personal data, more robust disclosures to individuals and a strengthened individual data rights regime, shortened timelines for data breach notifications, limitations on retention and secondary use of information, increased requirements pertaining to health data and pseudonymised (i.e., key-coded) data and additional obligations when Oncternal contracts third-party processors in connection with the processing of the personal data. The GDPR allows EU member states to make additional laws and regulations further limiting the processing of genetic, biometric or health data. Failure to comply with the requirements of GDPR and the applicable national data protection laws of the EU member states may result in fines of up to €20 million or up to 4% of the total worldwide annual turnover of the preceding financial year, whichever is higher, and other administrative penalties.

Ensuring that Oncternal's internal operations and business arrangements with third parties comply with applicable healthcare laws and regulations could involve substantial costs. It is possible that governmental authorities will conclude that Oncternal's business practices, including its consulting arrangements with physicians and other healthcare providers, some of whom received stock options as compensation for services provided, do not comply with current or future statutes, regulations, agency guidance or case law involving applicable fraud and abuse or other healthcare laws and regulations. If Oncternal's operations are found to be in violation of any of the laws described above or any other governmental laws and regulations that may apply to Oncternal, Oncternal may be subject to significant penalties, including civil, criminal and administrative penalties, damages, fines, exclusion from U.S. government funded healthcare programs, such as Medicare and Medicaid, or similar programs in other countries or jurisdictions, disgorgement, individual imprisonment, contractual damages, reputational harm, additional reporting requirements and oversight if Oncternal becomes subject to a corporate integrity agreement or similar agreement to resolve allegations of non-compliance with these laws, diminished profits and the curtailment or restructuring of Oncternal's operations. Further, defending against any such actions can be costly, time consuming and may require significant financial and personnel resources. Therefore, even if Oncternal is successful in defending against any such actions that may be brought against Oncternal, its business may be impaired. If any of the physicians or other providers or entities with whom Oncternal expects to do business are found to not be in compliance with applicable laws, they may be subject to criminal, civil or administrative sanctions, including exclusion from government funded healthcare programs and imprisonment. If any of the above occur, it could adversely affect Oncternal's ability to operate its business and its results of operations.

Recently enacted legislation, future legislation and healthcare reform measures may increase the difficulty and cost for Oncternal to obtain marketing approval for and commercialize its product candidates and may affect the prices Oncternal may set.

In the United States and some foreign jurisdictions, there have been, and Oncternal expects there will continue to be, a number of legislative and regulatory changes to the healthcare system, including cost-containment measures that may reduce or limit coverage and reimbursement for newly approved drugs and affect Oncternal's ability to

profitably sell any product candidates for which Oncternal obtains marketing approval. In particular, there have been and continue to be a number of initiatives at the U.S. federal and state levels that seek to reduce healthcare costs and improve the quality of healthcare.

For example, in March 2010, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act, collectively the Affordable Care Act, was enacted in the United States. Among the provisions of the Affordable Care Act of importance to Oncternal's potential product candidates, the Affordable Care Act: establishes an annual, nondeductible fee on any entity that manufactures or imports specified branded prescription drugs and biologic agents; extends manufacturers' Medicaid rebate liability to covered drugs dispensed to individuals who are enrolled in Medicaid managed care organizations; expands eligibility criteria for Medicaid programs; expands the entities eligible for discounts under the Public Health program; increases the statutory minimum rebates a manufacturer must pay under the Medicaid Drug Rebate Program; creates a new Medicare Part D coverage gap discount program; establishes a new Patient-Centered Outcomes Research Institute to oversee, identify priorities in and conduct comparative clinical effectiveness research, along with funding for such research; and establishes a Center for Medicare Innovation at CMS to test innovative payment and service delivery models to lower Medicare and Medicaid spending.

At this time, Oncternal is unsure of the full impact that the Affordable Care Act will have on its business. There have been judicial and political challenges to certain aspects of the Affordable Care Act. For example, since January 2017, President Trump has signed two executive orders and other directives designed to delay, circumvent, or loosen certain requirements of the Affordable Care Act. Concurrently, Congress has considered legislation that would repeal or repeal and replace all or part of the Affordable Care Act. While Congress has not passed comprehensive repeal legislation, two bills affecting the implementation of certain taxes under the Affordable Care Act have been signed into law. The Tax Act includes a provision repealing, effective January 1, 2019, the tax-based shared responsibility payment imposed by the Affordable Care Act on certain individuals who fail to maintain qualifying health coverage for all or part of a year that is commonly referred to as the "individual mandate." On January 22, 2018, President Trump signed a continuing resolution on appropriations for fiscal year 2018 that delayed the implementation of certain Affordable Care Act-mandated fees, including the so-called "Cadillac" tax on certain high cost employer-sponsored insurance plans, the annual fee imposed on certain health insurance providers based on market share. The Bipartisan Budget Act of 2018 (the "BBA"), among other things, amends the Affordable Care Act, effective January 1, 2019, to close the coverage gap in most Medicare drug plans, commonly referred to as the "donut hole," by increasing from 50 percent to 70 percent the point-of-sale discount that is owed by pharmaceutical manufacturers who participate in Medicare Part D. In July 2018, CMS published a final rule permitting further collections and payments to and from certain Affordable Care Act qualified health plans and health insurance issuers under the Affordable Care Act risk adjustment program in response to the outcome of federal district court litigation regarding the method CMS uses to determine this risk adjustment. On December 14, 2018, a U.S. District Court Judge in the Northern District of Texas, or Texas District Court Judge, ruled that the individual mandate is a critical and inseverable feature of the ACA, and therefore, because it was repealed as part of the Tax Act, the remaining provisions of the ACA are invalid as well. While the Texas District Court Judge, as well as the Trump Administration and CMS, have stated that the ruling will have no immediate effect, it is unclear how this decision, subsequent appeals, and other efforts to repeal and replace the ACA will impact the ACA and Oncternal's business.

In addition, other legislative changes have been proposed and adopted since the Affordable Care Act was enacted. On August 2, 2011, the Budget Control Act of 2011 was signed into law, which, among other things, resulted in reductions to Medicare payments to providers of 2% per fiscal year, which went into effect on April 1, 2013 and, due to subsequent legislative amendments to the statute, including the BBA, will remain in effect through 2027 unless additional Congressional action is taken. On January 2, 2013, the American Taxpayer Relief Act of 2012 was signed into law, which, among other things, reduced Medicare payments to several providers, including hospitals, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years.

Further, there has been heightened governmental scrutiny in the United States of pharmaceutical pricing practices in light of the rising cost of prescription drugs. Such scrutiny has resulted in several recent congressional inquiries and proposed and enacted federal and state legislation designed to, among other things, bring more transparency to product pricing, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for products.

At the federal level, the Trump administration's budget proposal for fiscal year 2019 contains further drug price control measures that could be enacted during the 2019 budget process or in other future legislation, including, for example, measures to permit Medicare Part D plans to negotiate the price of certain drugs under Medicare Part B, to allow some states to negotiate drug prices under Medicaid and to eliminate cost sharing for generic drugs for low-income patients. Additionally, the Trump administration released a "Blueprint" to lower drug prices through proposals to increase manufacturer competition, increase the negotiating power of certain federal healthcare programs, incentivize manufacturers to lower the list price of their products and reduce the out of pocket costs of drug products paid by consumers. The U.S. Department of Health and Human Services has begun the process of soliciting feedback on some of these measures and, at the same time, is implementing others under its existing authority. Although some of these, and other, proposals will require authorization through additional legislation to become effective, Congress and the Trump administration have each indicated that it will continue to seek new legislative and/or administrative measures to control drug costs.

At the state level, legislatures have increasingly passed legislation and implemented regulations designed to control pharmaceutical and biological product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access and marketing cost disclosure and transparency measures, and, in some cases, designed to encourage importation from other countries and bulk purchasing. Legally mandated price controls on payment amounts by third-party payors or other restrictions could harm Oncternal's business, results of operations, financial condition and prospects. In addition, regional healthcare authorities and individual hospitals are increasingly using bidding procedures to determine what pharmaceutical products and which suppliers will be included in their prescription drug and other healthcare programs. This could reduce the ultimate demand for Oncternal's product candidates, if approved, or put pressure on Oncternal's product pricing, which could negatively affect its business, results of operations, financial condition and prospects.

Additionally, on May 30, 2018, the Trickett Wendler, Frank Mongiello, Jordan McLinn, and Matthew Bellina Right to Try Act of 2017 ("Right to Try Act"), was signed into law. The law, among other things, provides a federal framework for certain patients with life-threatening diseases or conditions to access certain investigational new drug products that have completed a Phase 1 clinical trial. Under certain circumstances, eligible patients can seek treatment without enrolling in clinical trials and without obtaining FDA approval under the FDA expanded access program. There is no obligation for a drug manufacturer to make its drug products available to eligible patients as a result of the Right to Try Act.

Oncternal expects that the Affordable Care Act, these new laws and other healthcare reform measures that may be adopted in the future may result in additional reductions in Medicare and other healthcare funding, more rigorous coverage criteria, new payment methodologies and additional downward pressure on the price that Oncternal receives for any approved product. Any reduction in reimbursement from Medicare or other government programs may result in a similar reduction in payments from private payors. The implementation of cost containment measures or other healthcare reforms may prevent Oncternal from being able to generate revenue, attain profitability or commercialize its product candidates, if approved.

Oncternal and any of its third-party manufacturers or suppliers may use potent chemical agents and hazardous materials, and any claims relating to improper handling, storage or disposal of these materials could be time consuming or costly.

Oncternal and any of its third-party manufacturers or suppliers will use biological materials, potent chemical agents and may use hazardous materials, including chemicals and biological agents and compounds that could be

dangerous to human health and safety of the environment. Oncternal's historical operations and the operations of its third-party manufacturers and suppliers also produce hazardous waste products. Federal, state and local laws and regulations govern the use, generation, manufacture, storage, handling and disposal of these materials and wastes. Compliance with applicable environmental laws and regulations may be expensive, and current or future environmental laws and regulations may impair Oncternal's product development efforts. In addition, Oncternal cannot eliminate the risk of accidental injury or contamination from these materials or wastes. Oncternal does not carry specific biological or hazardous waste insurance coverage, and Oncternal's property, casualty and general liability insurance policies specifically exclude coverage for damages and fines arising from biological or hazardous waste exposure or contamination. In the event of contamination or injury, Oncternal could be held liable for damages or be penalized with fines in an amount exceeding its resources, and its clinical trials or regulatory approvals could be suspended.

Although Oncternal maintains workers' compensation insurance for certain costs and expenses it may incur due to injuries to Oncternal's employees resulting from the use of hazardous materials or other work-related injuries, this insurance may not provide adequate coverage against potential liabilities. Oncternal does not maintain insurance for toxic tort claims that may be asserted against Oncternal in connection with its storage or disposal of biologic, hazardous or radioactive materials.

In addition, Oncternal may incur substantial costs in order to comply with current or future environmental, health and safety laws and regulations, which have tended to become more stringent over time. These current or future laws and regulations may impair Oncternal's research, development or production efforts. Failure to comply with these laws and regulations also may result in substantial fines, penalties or other sanctions or liabilities, which could materially adversely affect Oncternal's business, financial condition, results of operations and prospects.

If product liability lawsuits are brought against Oncternal, Oncternal may incur substantial liabilities and may be required to limit commercialization of its products.

Oncternal faces an inherent risk of product liability as a result of the clinical trials of Oncternal's product candidates and will face an even greater risk if Oncternal commercializes its product candidates. For example, Oncternal may be sued if its product candidates allegedly cause injury or are found to be otherwise unsuitable during product testing, manufacturing, marketing or sale. Any such product liability claims may include allegations of defects in manufacturing, defects in design, a failure to warn of dangers inherent in the product candidate, negligence, strict liability and a breach of warranties. Claims may be brought against Oncternal by clinical trial participants, patients or others using, administering or selling products that may be approved in the future. Claims could also be asserted under state consumer protection acts.

If Oncternal cannot successfully defend itself against product liability claims, Oncternal may incur substantial liabilities or be required to limit or cease the commercialization of its products. Even a successful defense would require significant financial and management resources. Regardless of the merits or eventual outcome, liability claims may result in:

- decreased demand for Oncternal's products;
- injury to Oncternal's reputation and significant negative media attention;
- withdrawal of clinical trial participants;
- costs to defend the related litigation;
- a diversion of management's time and Oncternal's resources;
- substantial monetary awards to trial participants or patients;
- product recalls, withdrawals or labeling, marketing or promotional restrictions;
- significant negative financial impact;

- the inability to commercialize Oncternal's product candidates; and
- a decline in Oncternal's stock price.

Oncternal currently holds approximately $10.0 million in product liability insurance coverage in the aggregate. Oncternal may need to increase its insurance coverage as it expands its clinical trials or if it commences commercialization of its product candidates. Insurance coverage is increasingly expensive. Oncternal's inability to obtain and retain sufficient product liability insurance at an acceptable cost to protect against potential product liability claims could prevent or inhibit the commercialization of Oncternal's product candidates. Although Oncternal maintains such insurance, any claim that may be brought against it could result in a court judgment or settlement in an amount that is not covered, in whole or in part, by Oncternal's insurance or that is in excess of the limits of its insurance coverage. Oncternal's insurance policies will also have various exclusions, and Oncternal may be subject to a product liability claim for which it has no coverage. Oncternal may have to pay any amounts awarded by a court or negotiated in a settlement that exceed its coverage limitations or that are not covered by its insurance, and Oncternal may not have, or be able to obtain, sufficient capital to pay such amounts.

Oncternal and any of its potential future collaborators will be required to report to regulatory authorities if any of Oncternal's approved products cause or contribute to adverse medical events, and any failure to do so would result in sanctions that would materially harm Oncternal's business.

If Oncternal and any of its potential future collaborators are successful in commercializing Oncternal's products, the FDA and foreign regulatory authorities would require that Oncternal and any of its potential future collaborators report certain information about adverse medical events if those products may have caused or contributed to those adverse events. The timing of Oncternal's obligation to report would be triggered by the date Oncternal becomes aware of the adverse event as well as the nature of the event. Oncternal and any of its potential future collaborators or CROs may fail to report adverse events within the prescribed timeframe. If Oncternal or any of its potential future collaborators or CROs fail to comply with such reporting obligations, the FDA or a foreign regulatory authority could take action, including criminal prosecution, the imposition of civil monetary penalties, seizure of Oncternal's products or delay in approval or clearance of future products.

Oncternal's internal computer systems, or those of any of its CROs, manufacturers, other contractors or consultants or potential future collaborators, may fail or suffer security breaches, which could result in a material disruption of Oncternal's product development programs.

The United States federal and various state and foreign governments have adopted or proposed requirements regarding the collection, distribution, use, security, and storage of personally identifiable information and other data relating to individuals, and federal and state consumer protection laws are being applied to enforce regulations related to the online collection, use, and dissemination of data. Despite the implementation of security measures, Oncternal's internal computer systems and those of its current and any future CROs and other contractors, consultants and collaborators are vulnerable to damage from computer viruses, cybersecurity threats, unauthorized access, natural disasters, terrorism, war and telecommunication and electrical failures. If such an event were to occur and cause interruptions in Oncternal's operations or result in the unauthorized disclosure of or access to personally identifiable information or individually identifiable health information (violating certain privacy laws such as GDPR), it could result in a material disruption of Oncternal's development programs and its business operations, whether due to a loss of Oncternal's trade secrets or other similar disruptions. Some of the federal, state and foreign government requirements include obligations of companies to notify individuals of security breaches involving particular personally identifiable information, which could result from breaches experienced by Oncternal or by its vendors, contractors, or organizations with which Oncternal has formed strategic relationships. Even though Oncternal may have contractual protections with such vendors, contractors, or other organizations, notifications and follow-up actions related to a security breach could impact Oncternal's reputation, cause Oncternal to incur significant costs, including legal expenses, harm customer confidence, hurt

Oncternal's expansion into new markets, cause Oncternal to incur remediation costs, or cause Oncternal to lose existing customers. For example, the loss of clinical trial data from completed or future clinical trials could result in delays in Oncternal's regulatory approval efforts and significantly increase Oncternal's costs to recover or reproduce the data. Oncternal also relies on third parties to manufacture its product candidates, and similar events relating to their computer systems could also have a material adverse effect on Oncternal's business. To the extent that any disruption or security breach were to result in a loss of, or damage to, Oncternal's data or applications, or inappropriate disclosure of confidential or proprietary information, Oncternal could incur liability, the further development and commercialization of Oncternal's product candidates could be delayed, and Oncternal could be subject to significant fines, penalties or liabilities for any noncompliance to certain privacy and security laws.

Business disruptions could seriously harm Oncternal's future revenue and financial condition and increase its costs and expenses.

Oncternal's operations could be subject to earthquakes, power shortages, telecommunications failures, water shortages, floods, hurricanes, typhoons, fires, extreme weather conditions, medical epidemics and other natural or manmade disasters or business interruptions, for which Oncternal is predominantly self-insured. Oncternal relies on third- party manufacturers to produce Oncternal's product candidates. Oncternal's ability to obtain clinical supplies of its product candidates could be disrupted if the operations of these suppliers were affected by a man-made or natural disaster or other business interruption. In addition, Oncternal's corporate headquarters is located in San Diego, California near major earthquake faults and fire zones, and the ultimate impact on Oncternal of being located near major earthquake faults and fire zones and being consolidated in a certain geographical area is unknown. The occurrence of any of these business disruptions could seriously harm Oncternal's operations and financial condition and increase its costs and expenses.

Oncternal's employees and independent contractors, including principal investigators, CROs, consultants and vendors, may engage in misconduct or other improper activities, including noncompliance with regulatory standards and requirements.

Oncternal is exposed to the risk that its employees and independent contractors, including principal investigators, CROs, consultants and vendors may engage in misconduct or other illegal activity. Misconduct by these parties could include intentional, reckless and/or negligent conduct or disclosure of unauthorized activities to Oncternal that violate: (1) the laws and regulations of the FDA and other similar regulatory requirements, including those laws that require the reporting of true, complete and accurate information to such authorities, (2) manufacturing standards, including cGMP requirements, (3) federal and state data privacy, security, fraud and abuse and other healthcare laws and regulations in the United States and abroad or (4) laws that require the true, complete and accurate reporting of financial information or data. Activities subject to these laws also involve the improper use or misrepresentation of information obtained in the course of clinical trials, the creation of fraudulent data in Oncternal's preclinical studies or clinical trials, or illegal misappropriation of drug product, which could result in regulatory sanctions and cause serious harm to Oncternal's reputation. It is not always possible to identify and deter misconduct by employees and other third parties, and the precautions Oncternal takes to detect and prevent this activity may not be effective in controlling unknown or unmanaged risks or losses or in protecting Oncternal from governmental investigations or other actions or lawsuits stemming from a failure to be in compliance with such laws or regulations. In addition, Oncternal is subject to the risk that a person or government could allege such fraud or other misconduct, even if none occurred. If any such actions are instituted against Oncternal, and Oncternal is not successful in defending itself or asserting its rights, those actions could have a significant impact on Oncternal's business and financial results, including, without limitation, the imposition of significant civil, criminal and administrative penalties, damages, monetary fines, disgorgements, possible exclusion from participation in Medicare, Medicaid and other federal healthcare programs, individual imprisonment, contractual damages, reputational harm, diminished profits and future earnings, additional reporting requirements and oversight if Oncternal becomes subject to a corporate integrity agreement or similar agreement to resolve allegations of non-compliance with these laws, and curtailment of Oncternal's operations, any of which could adversely affect Oncternal's ability to operate its business and its results of operations.

Oncternal is subject to U.S. and certain foreign export and import controls, sanctions, embargoes, anti-corruption laws and anti-money laundering laws and regulations. Compliance with these legal standards could impair Oncternal's ability to compete in domestic and international markets. Oncternal could face criminal liability and other serious consequences for violations, which could harm its business.

Oncternal is subject to export control and import laws and regulations, including the U.S. Export Administration Regulations, U.S. Customs regulations, and various economic and trade sanctions regulations administered by the U.S. Treasury Department's Office of Foreign Assets Controls, and anti-corruption and anti-money laundering laws and regulations, including the U.S. Foreign Corrupt Practices Act of 1977, as amended, the U.S. domestic bribery statute contained in 18 U.S.C. § 201, the U.S. Travel Act, the USA PATRIOT Act, and other state and national anti-bribery and anti-money laundering laws in the countries in which Oncternal conducts activities. Anti-corruption laws are interpreted broadly and prohibit companies and their employees, agents, clinical research organizations, contractors and other collaborators and partners from authorizing, promising, offering, providing, soliciting or receiving, directly or indirectly, improper payments or anything else of value to recipients in the public or private sector. Oncternal may engage third parties for clinical trials outside of the United States, to sell its products abroad once Oncternal enters a commercialization phase, and/or to obtain necessary permits, licenses, patent registrations and other regulatory approvals. Oncternal has direct or indirect interactions with officials and employees of government agencies or government-affiliated hospitals, universities and other organizations. Oncternal can be held liable for the corrupt or other illegal activities of its employees, agents, clinical research organizations, contractors and other collaborators and partners, even if Oncternal does not explicitly authorize or have actual knowledge of such activities. Any violations of the laws and regulations described above may result in substantial civil and criminal fines and penalties, imprisonment, the loss of export or import privileges, debarment, tax reassessments, breach of contract and fraud litigation, reputational harm and other consequences.

Oncternal may engage in strategic transactions that could impact its liquidity, increase its expenses and present significant distractions to Oncternal's management.

From time to time, Oncternal may consider strategic transactions, such as acquisitions of companies, asset purchases and out-licensing or in-licensing of intellectual property, products or technologies, similar to Oncternal's approach in in-licensing and acquiring its current product candidates. Any future transactions could increase Oncternal's near and long-term expenditures, result in potentially dilutive issuances of Oncternal's equity securities, including its common stock, or the incurrence of debt, contingent liabilities, amortization expenses or acquired in-process research and development expenses, any of which could affect Oncternal's financial condition, liquidity and results of operations. Additional potential transactions that Oncternal may consider in the future include a variety of business arrangements, including spin-offs, strategic partnerships, joint ventures, restructurings, divestitures, business combinations and investments. Future acquisitions may also require Oncternal to obtain additional financing, which may not be available on favorable terms or at all. These transactions may never be successful and may require significant time and attention of management. In addition, the integration of any business that Oncternal may acquire in the future may disrupt Oncternal's existing business and may be a complex, risky and costly endeavor for which Oncternal may never realize the full benefits of the acquisition. Accordingly, although there can be no assurance that Oncternal will undertake or successfully complete any additional transactions of the nature described above, any additional transactions that Oncternal does complete could have a material adverse effect on Oncternal's business, results of operations, financial condition and prospects.

Risks Related to Oncternal's Intellectual Property

Oncternal's success depends on its ability to protect its intellectual property and its proprietary technologies.

Oncternal's commercial success depends in part on its ability to obtain and maintain patent protection and trade secret protection for its product candidates, proprietary technologies and their uses as well as its ability to operate without infringing upon the proprietary rights of others. If Oncternal is unable to protect its intellectual property

rights or if its intellectual property rights are inadequate for its technology or its product candidates, Oncternal's competitive position could be harmed. Oncternal generally seeks to protect its proprietary position by licensing or filing patent applications in the United States and abroad related to its product candidates, proprietary technologies and their uses that are important to Oncternal's business. Oncternal's or its licensor's patent applications cannot be enforced against third parties practicing the technology claimed in such applications unless, and until, patents issue from such applications, and then only to the extent the issued claims cover the technology. There can be no assurance that Oncternal's or its licensor's patent applications will result in patents being issued or that issued patents will afford sufficient protection against competitors with similar technology, nor can there be any assurance that the patents if issued will not be infringed, designed around or invalidated by third parties. Even issued patents may later be found invalid or unenforceable or may be modified or revoked in proceedings instituted by third parties before various patent offices or in courts. The degree of future protection for Oncternal's proprietary rights is uncertain. Only limited protection may be available and may not adequately protect Oncternal's rights or permit it to gain or keep any competitive advantage. These uncertainties and/or limitations in Oncternal's ability to properly protect the intellectual property rights relating to Oncternal's product candidates could have a material adverse effect on Oncternal's financial condition and results of operations.

Although Oncternal owns and licenses issued patents in the United States and foreign countries, Oncternal cannot be certain that the claims in Oncternal's or its licensor's other U.S. pending patent applications, corresponding international patent applications and patent applications in certain foreign countries will be considered patentable by the United States Patent and Trademark Office ("USPTO"), courts in the United States or by the patent offices and courts in foreign countries, nor can Oncternal be certain that the claims in its or its licensor's issued patents will not be found invalid or unenforceable if challenged.

The patent application process is subject to numerous risks and uncertainties, and there can be no assurance that Oncternal, its licensors or any of its potential future collaborators will be successful in protecting Oncternal's product candidates by obtaining and defending patents. These risks and uncertainties include the following:

- the USPTO and various foreign governmental patent agencies require compliance with a number of procedural, documentary, fee payment and other provisions during the patent process, the noncompliance with which can result in abandonment or lapse of a patent or patent application, and partial or complete loss of patent rights in the relevant jurisdiction;
- patent applications may not result in any patents being issued;
- patents may be challenged, invalidated, modified, revoked, circumvented, found to be unenforceable or otherwise may not provide any competitive advantage;
- Oncternal's competitors, many of whom have substantially greater resources than Oncternal does and many of whom have made significant investments in competing technologies, may seek or may have already obtained patents that will limit, interfere with or block Oncternal's ability to make, use and sell Oncternal's product candidates;
- there may be significant pressure on the U.S. government and international governmental bodies to limit the scope of patent protection both inside and outside the United States for disease treatments that prove successful, as a matter of public policy regarding worldwide health concerns; and
- countries other than the United States may have patent laws less favorable to patentees than those upheld by U.S. courts, allowing foreign competitors a better opportunity to create, develop and market competing products.

The patent prosecution process is also expensive and time consuming, and Oncternal and its licensors may not be able to file and prosecute all necessary or desirable patent applications at a reasonable cost or in a timely manner or in all jurisdictions where protection may be commercially advantageous. It is also possible that Oncternal or its licensors will fail to identify patentable aspects of its research and development output before it is too late to

obtain patent protection. Moreover, in some circumstances, Oncternal does not have the right to control the preparation, filing and prosecution of patent applications, or to maintain the patents, directed to technology that Oncternal licenses from third parties. Oncternal may also require the cooperation of its licensor in order to enforce the licensed patent rights, and such cooperation may not be provided. Therefore, these patents and applications may not be prosecuted and enforced in a manner consistent with the best interests of Oncternal's business. Oncternal cannot be certain that patent prosecution and maintenance activities by its licensors have been or will be conducted in compliance with applicable laws and regulations, which may affect the validity and enforceability of such patents or any patents that may issue from such applications. If they fail to do so, this could cause Oncternal to lose rights in any applicable intellectual property that it in-licenses, and as a result Oncternal's ability to develop and commercialize products or product candidates may be adversely affected and it may be unable to prevent competitors from making, using and selling competing products.

In addition, although Oncternal enters into non-disclosure and confidentiality agreements with parties who have access to patentable aspects of its research and development output, such as Oncternal's employees, outside scientific collaborators, CROs, third-party manufacturers, consultants, advisors, licensees, collaboration partners, and other third parties, any of these parties may breach such agreements and disclose such output before a patent application is filed, thereby jeopardizing Oncternal's ability to seek patent protection.

If Oncternal fails to comply with its obligations in the agreements under which it licenses intellectual property rights from third parties, including with respect to cirmtuzumab and TK216, or otherwise experiences disruptions in its business relationships with its licensors, Oncternal could lose license rights that are important to its business.

Oncternal is a party to several license agreements under which it is granted rights to intellectual property that are important to its business and Oncternal may enter into additional license agreements in the future. For example, in March 2014, Oncternal entered into an exclusive license agreement with Georgetown University, or Georgetown, to obtain an exclusive license to certain intellectual property rights to develop and commercialize compounds targeting EWS-FLI1. In March 2016, Oncternal entered into an exclusive license agreement with the Regents of the University of California (the "Regents"), to obtain an exclusive license to certain intellectual property rights to develop and commercialize cirmtuzumab and other ROR1 related naked antibodies.

These license agreements impose, and Oncternal expects that any future license agreements where Oncternal in-licenses intellectual property, will impose on Oncternal, various development, regulatory and/or commercial diligence obligations, payment of milestones and/or royalties and other obligations. If Oncternal fails to comply with its obligations under these agreements, or Oncternal is subject to bankruptcy-related proceedings, the licensor may have the right to terminate the license, in which event Oncternal would not be able to market products covered by the license.

Oncternal may need to obtain licenses from third parties to advance its research or allow commercialization of its product candidates, and Oncternal cannot provide any assurances that third-party patents do not exist which might be enforced against Oncternal's product candidates in the absence of such a license. Oncternal may fail to obtain any of these licenses on commercially reasonable terms, if at all. Even if Oncternal is able to obtain a license, it may be non-exclusive, thereby giving Oncternal's competitors access to the same technologies licensed to Oncternal. In that event, Oncternal may be required to expend significant time and resources to develop or license replacement technology. If Oncternal is unable to do so, Oncternal may be unable to develop or commercialize the affected product candidates, which could materially harm Oncternal's business and the third parties owning such intellectual property rights could seek either an injunction prohibiting Oncternal's sales, or, with respect to Oncternal's sales, an obligation on Oncternal's part to pay royalties and/or other forms of compensation. Licensing of intellectual property is of critical importance to Oncternal's business and involves complex legal, business and scientific issues. Disputes may arise between Oncternal and its licensors regarding intellectual property subject to a license agreement, including:

- the scope of rights granted under the license agreement and other interpretation-related issues;

- whether and the extent to which Oncternal's technology and processes infringe on intellectual property of the licensor that is not subject to the licensing agreement;
- Oncternal's right to sublicense patents and other rights to third parties;
- Oncternal's diligence obligations with respect to the use of the licensed technology in relation to its development and commercialization of Oncternal's product candidates, and what activities satisfy those diligence obligations;
- Oncternal's right to transfer or assign the license; and
- the ownership of inventions and know-how resulting from the joint creation or use of intellectual property by Oncternal's licensors and Oncternal and its partners.

If disputes over intellectual property that Oncternal has licensed prevent or impair Oncternal's ability to maintain its current licensing arrangements on acceptable terms, Oncternal may not be able to successfully develop and commercialize the affected product candidates, which would have a material adverse effect on Oncternal's business.

If the scope of any patent protection Oncternal obtains is not sufficiently broad, or if it loses any of its patent protection, Oncternal's ability to prevent its competitors from commercializing similar or identical product candidates would be adversely affected.

The patent position of biopharmaceutical companies generally is highly uncertain, involves complex legal and factual questions, and has been the subject of much litigation in recent years. As a result, the issuance, scope, validity, enforceability and commercial value of Oncternal's and its licensor's patent rights are highly uncertain. Oncternal's and its licensor's pending and future patent applications may not result in patents being issued which protect Oncternal's product candidates or which effectively prevent others from commercializing competitive product candidates.

Moreover, the coverage claimed in a patent application can be significantly reduced before the patent is issued, and its scope can be reinterpreted after issuance. Even if patent applications Oncternal owns or licenses currently or in the future issue as patents, they may not issue in a form that will provide Oncternal with any meaningful protection, prevent competitors or other third parties from competing with Oncternal, or otherwise provide Oncternal with any competitive advantage. Any patents that Oncternal owns or licenses may be challenged or circumvented by third parties or may be narrowed or invalidated as a result of challenges by third parties. Consequently, Oncternal does not know whether its product candidates will be protectable or remain protected by valid and enforceable patents. Oncternal's competitors or other third parties may be able to circumvent Oncternal's or its licensor's patents by developing similar or alternative technologies or products in a non-infringing manner which could materially adversely affect Oncternal's business, financial condition, results of operations and prospects.

The issuance of a patent is not conclusive as to its inventorship, scope, validity or enforceability, and Oncternal's and it licensor's patents may not cover its product candidates or may be challenged in the courts or patent offices in the United States and abroad. Oncternal's and its licensor's patents may be subject to a third-party pre-issuance submission of prior art to the USPTO, or become involved in opposition, derivation, revocation, reexamination, post-grant review, or PGR, and inter partes review ("IPR"), or other similar proceedings in the USPTO or foreign patent offices challenging Oncternal's or its licensor's patent rights. The outcome following legal assertions of invalidity and unenforceability is unpredictable. With respect to the validity question, for example, Oncternal cannot be certain that there is no invalidating prior art, of which Oncternal or its predecessors or its licensor and the patent examiner were unaware during prosecution. There is no assurance that all potentially relevant prior art relating to Oncternal's patents and patent applications or those of Oncternal's licensors has been found. There is also no assurance that there is not prior art of which Oncternal, its predecessors or licensors are aware, but which Oncternal does not believe affects the validity or enforceability

of a claim in Oncternal's patents and patent applications or those of its licensors, which may, nonetheless, ultimately be found to affect the validity or enforceability of a claim. An adverse determination in any such submission, proceeding or litigation could reduce the scope of, or invalidate or render unenforceable, Oncternal's or its licensor's patent rights, allow third parties to commercialize Oncternal's product candidates and compete directly with Oncternal, without payment to Oncternal. Such loss of patent rights, loss of exclusivity or in patent claims being narrowed, invalidated or held unenforceable could limit Oncternal's ability to stop others from using or commercializing similar or identical technology and products, or limit the duration of the patent protection of Oncternal's product candidates. Such proceedings also may result in substantial cost and require significant time from Oncternal's scientists and management, even if the eventual outcome is favorable to Oncternal. In addition, if the breadth or strength of protection provided by Oncternal's or its licensor's patents and patent applications is threatened, regardless of the outcome, it could dissuade companies from collaborating with Oncternal to license, develop or commercialize current or future product candidates.

The patent protection and patent prosecution for some of Oncternal product candidates may be dependent on third parties.

Oncternal or its licensors may fail to identify patentable aspects of inventions made in the course of development and commercialization activities before it is too late to obtain patent protection on them. Therefore, Oncternal or its licensors may miss potential opportunities to strengthen its patent position. It is possible that defects of form in the preparation or filing of Oncternal's or its licensor's patents or patent applications may exist, or may arise in the future, for example with respect to proper priority claims, inventorship, claim scope, or requests for patent term adjustments. If there are material defects in the form, preparation, prosecution, or enforcement of Oncternal's or its licensor's patents or patent applications, such patents may be invalid and/or unenforceable, and such applications may never result in valid, enforceable patents. If Oncternal or its licensors, whether current or future, fail to establish, maintain or protect its patents and other intellectual property rights, such rights may be reduced or eliminated. If Oncternal's licensors are not fully cooperative or disagree with Oncternal as to the prosecution, maintenance or enforcement of any patent rights, such patent rights could be compromised. Any of these outcomes could impair Oncternal's ability to prevent competition from third parties, which may have an adverse impact on Oncternal's business.

As a licensee of third parties, Oncternal relies on third parties to file and prosecute patent applications and maintain patents and otherwise protect the licensed intellectual property under some of Oncternal's license agreements. Oncternal has not had and does not have primary control over these activities for certain of Oncternal's patents or patent applications and other intellectual property rights. Oncternal cannot be certain that such activities by third parties have been or will be conducted in compliance with applicable laws and regulations or will result in valid and enforceable patents or other intellectual property rights. Pursuant to the terms of the license agreements with some of Oncternal's licensors, the licensors may have the right to control enforcement of Oncternal's licensed patents or defense of any claims asserting the invalidity of these patents and even if Oncternal is permitted to pursue such enforcement or defense, Oncternal will require the cooperation of its licensors. Oncternal cannot be certain that its licensors will allocate sufficient resources or prioritize their or Oncternal's enforcement of such patents or defense of such claims to protect Oncternal's interests in the licensed patents. Even if Oncternal is not a party to these legal actions, an adverse outcome could harm Oncternal's business because it might prevent Oncternal from continuing to license intellectual property that Oncternal may need to operate its business. If any of Oncternal's licensors or any of its future licensors or future collaborators fail to appropriately prosecute and maintain patent protection for patents covering any of Oncternal's product candidates, Oncternal's ability to develop and commercialize those product candidates may be adversely affected and Oncternal may not be able to prevent competitors from making, using and selling competing products.

In addition, even where Oncternal has the right to control patent prosecution of patents and patent applications Oncternal has acquired or licensed from third parties, Oncternal may still be adversely affected or prejudiced by actions or inactions of its predecessors or licensors and their counsel that took place prior to Oncternal assuming control over patent prosecution.

Oncternal's technology acquired or licensed from various third parties may be subject to retained rights. Oncternal's predecessors or licensors often retain certain rights under their agreements with Oncternal, including the right to use the underlying technology for noncommercial academic and research use, to publish general scientific findings from research related to the technology, and to make customary scientific and scholarly disclosures of information relating to the technology. It is difficult to monitor whether Oncternal's predecessors or licensors limit their use of the technology to these uses, and Oncternal could incur substantial expenses to enforce Oncternal's rights to its licensed technology in the event of misuse.

If Oncternal is limited in its ability to utilize acquired or licensed technologies, or if Oncternal loses its rights to critical in-licensed technology, Oncternal may be unable to successfully develop, out-license, market and sell its products, which could prevent or delay new product introductions. Oncternal's business strategy depends on the successful development of licensed and acquired technologies into commercial products. Therefore, any limitations on Oncternal's ability to utilize these technologies may impair Oncternal's ability to develop, out-license or market and sell its product candidate.

Some of Oncternal's intellectual property has been discovered through government funded programs and thus may be subject to federal regulations such as "march-in" rights, certain reporting requirements and a preference for U.S.-based companies. Compliance with such regulations may limit Oncternal's exclusive rights, and limit Oncternal's ability to contract with non-U.S. manufacturers.

Some of the intellectual property rights Oncternal has acquired or licensed or may acquire or license in the future may have been generated through the use of U.S. government funding and may therefore be subject to certain federal regulations. For example, some of the research and development work on cirmtuzumab and TK216 was funded by government research grants. As a result, the U.S. government may have certain rights to intellectual property embodied in Oncternal's product candidates pursuant to the Bayh-Dole Act of 1980, or Bayh-Dole Act. These U.S. government rights include a non-exclusive, non-transferable, irrevocable worldwide license to use inventions for any governmental purpose. In addition, the U.S. government has the right, under certain limited circumstances, to require Oncternal to grant exclusive, partially exclusive, or non-exclusive licenses to any of these inventions to a third-party if it determines that: (i) adequate steps have not been taken to commercialize the invention; (ii) government action is necessary to meet public health or safety needs; or (iii) government action is necessary to meet requirements for public use under federal regulations (also referred to as "march-in rights"). The U.S. government also has the right to take title to these inventions if the grant recipient fails to disclose the invention to the government or fails to file an application to register the intellectual property within specified time limits. Intellectual property generated under a government funded program is also subject to certain reporting requirements, compliance with which may require Oncternal to expend substantial resources. In addition, the U.S. government requires that any products embodying any of these inventions or produced through the use of any of these inventions be manufactured substantially in the United States. This preference for U.S. industry may be waived by the federal agency that provided the funding if the owner or assignee of the intellectual property can show that reasonable but unsuccessful efforts have been made to grant licenses on similar terms to potential licensees that would be likely to manufacture substantially in the United States or that under the circumstances domestic manufacture is not commercially feasible. This preference for U.S. industry may limit Oncternal's ability to contract with non-U.S. product manufacturers for products covered by such intellectual property. To the extent any of Oncternal's future intellectual property is also generated through the use of U.S. government funding, the provisions of the Bayh-Dole Act may similarly apply.

Intellectual property rights do not necessarily address all potential threats to Oncternal's competitive advantage.

The degree of future protection afforded by Oncternal's intellectual property rights is uncertain because intellectual property rights have limitations, and may not adequately protect Oncternal's business or permit Oncternal to maintain its competitive advantage. For example:

- others may be able to develop products that are similar to Oncternal's product candidates but that are not covered by the claims of the patents that Oncternal owns or licenses;
- Oncternal or its licensors or predecessors might not have been the first to make the inventions covered by the issued patents or patent applications that Oncternal owns or licenses;
- Oncternal or its licensors or predecessors might not have been the first to file patent applications covering certain of Oncternal's inventions;
- others may independently develop similar or alternative technologies or duplicate any of Oncternal's technologies without infringing Oncternal's intellectual property rights;
- it is possible that Oncternal's or its licensor's pending patent applications will not lead to issued patents;
- issued patents that Oncternal owns or licenses may be held invalid or unenforceable, as a result of legal challenges by Oncternal's competitors;
- Oncternal's competitors might conduct research and development activities in countries where Oncternal does not have patent rights and then use the information learned from such activities to develop competitive products for sale in Oncternal's major commercial markets;
- Oncternal may not develop additional proprietary technologies that are patentable; and
- the patents of others may have an adverse effect on Oncternal's business.

Should any of these events occur, it could significantly harm Oncternal's business, results of operations and prospects.

Oncternal relies on licensee relationships, and any disputes or litigation with our partners or termination or breach of any of the related agreements could reduce the financial resources available to us, including milestone payments and future royalty revenues.

Oncternal's existing collaborations may not continue or be successful, and Oncternal may be unable to enter into future collaborative arrangements to develop and commercialize its unpartnered assets. If any of Oncternal's collaborative partners breach or terminate their agreements with Oncternal or otherwise fail to conduct their collaborative activities successfully, Oncternal's product development under these agreements will be delayed or terminated. Disputes or litigation may also arise with our collaborators (with us and/or with one or more third parties), including those over ownership rights to intellectual property, know-how or technologies developed with our collaborators. Such disputes or litigation could adversely affect our rights to one or more of our product candidates and could delay, interrupt or terminate the collaborative research, development and commercialization of certain potential products, create uncertainty as to ownership rights of intellectual property, or could result in litigation or arbitration. In addition, a significant downturn or deterioration in the business or financial condition of our collaborators or partners could result in a loss of expected revenue and our expected returns on investment. The occurrence of any of these problems could be time-consuming and expensive and could adversely affect our business.

Oncternal's commercial success depends significantly on its ability to operate without infringing the patents and other proprietary rights of third parties. Claims by third parties that Oncternal infringes their proprietary rights may result in liability for damages or prevent or delay Oncternal's developmental and commercialization efforts.

Oncternal's commercial success depends in part on avoiding infringement of the patents and proprietary rights of third parties. However, Oncternal's or its licensee's research, development and commercialization activities may be subject to claims that Oncternal or its licensee infringes or otherwise violates patents or other intellectual property rights owned or controlled by third parties. Other entities may have or obtain patents or proprietary rights that could limit Oncternal's or its licensee's ability to make, use, sell, offer for sale or import Oncternal's product candidates and products that may be approved in the future, or impair Oncternal's competitive position. There is a substantial amount of litigation, both within and outside the United States, involving patent and other intellectual property rights in the biopharmaceutical industry, including patent infringement lawsuits, oppositions, reexaminations, IPR proceedings and PGR proceedings before the USPTO and/or foreign patent offices. Numerous third-party U.S. and foreign issued patents and pending patent applications exist in the fields in which Oncternal is developing product candidates. There may be third-party patents or patent applications with claims to materials, formulations, methods of manufacture or methods for treatment related to the use or manufacture of Oncternal's product candidates.

As the biopharmaceutical industry expands and more patents are issued, the risk increases that Oncternal's product candidates may be subject to claims of infringement of the patent rights of third parties. Because patent applications are maintained as confidential for a certain period of time, until the relevant application is published Oncternal may be unaware of third-party patents that may be infringed by commercialization of any of Oncternal's product candidates, and Oncternal cannot be certain that Oncternal was the first to file a patent application related to a product candidate or technology. Moreover, because patent applications can take many years to issue, there may be currently-pending patent applications that may later result in issued patents that Oncternal's product candidates may infringe. In addition, identification of third-party patent rights that may be relevant to Oncternal's technology is difficult because patent searching is imperfect due to differences in terminology among patents, incomplete databases and the difficulty in assessing the meaning of patent claims. In addition, third parties may obtain patents in the future and claim that use of Oncternal's technologies infringes upon these patents. Any claims of patent infringement asserted by third parties would be time consuming and could:

- result in costly litigation that may cause negative publicity;
- divert the time and attention of Oncternal's technical personnel and management;
- cause development delays;
- subject Oncternal to an injunction preventing Oncternal from making, using, selling, offering for sale, or importing Oncternal products;
- prevent Oncternal from commercializing any of its product candidates until the asserted patent expires or is held finally invalid or not infringed in a court of law;
- require Oncternal to develop non-infringing technology, which may not be possible on a cost-effective basis;
- subject Oncternal to significant liability to third parties; or
- require Oncternal to enter into royalty or licensing agreements, which may not be available on commercially reasonable terms, or at all, or which might be non-exclusive, which could result in Oncternal's competitors gaining access to the same technology.

Although no third-party has asserted a claim of patent infringement against Oncternal as of the date of this prospectus, others may hold proprietary rights that could prevent Oncternal's product candidates from being

marketed. Any patent-related legal action against Oncternal claiming damages and seeking to enjoin activities relating to Oncternal's product candidates or processes could subject Oncternal to potential liability for damages, including treble damages if Oncternal was determined to willfully infringe, and require Oncternal to obtain a license to manufacture or develop its product candidates. Defense of these claims, regardless of their merit, would involve substantial litigation expense and would be a substantial diversion of employee resources from Oncternal's business. Oncternal cannot predict whether it would prevail in any such actions or that any license required under any of these patents would be made available on commercially reasonable terms, if at all. Moreover, even if Oncternal or its future strategic partners were able to obtain a license, the rights may be nonexclusive, which could result in Oncternal's competitors gaining access to the same intellectual property. In addition, Oncternal cannot be certain that it could redesign its product candidates or processes to avoid infringement, if necessary. Accordingly, an adverse determination in a judicial or administrative proceeding, or the failure to obtain necessary licenses, could prevent Oncternal from developing and commercializing its product candidates, which could harm Oncternal's business, financial condition and operating results.

Parties making claims against Oncternal may be able to sustain the costs of complex patent litigation more effectively than Oncternal can because they have substantially greater resources. Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation or administrative proceedings, there is a risk that some of Oncternal's confidential information could be compromised by disclosure. In addition, any uncertainties resulting from the initiation and continuation of any litigation could have a material adverse effect on Oncternal's ability to raise additional funds or otherwise have a material adverse effect on Oncternal's business, results of operations, financial condition and prospects.

Oncternal may be involved in lawsuits to protect or enforce Oncternal's patents or the patents of its licensors, which could be expensive, time consuming and unsuccessful. Further, Oncternal's issued patents could be found invalid or unenforceable if challenged in court.

Competitors may infringe Oncternal's intellectual property rights or those of its licensors. To prevent infringement or unauthorized use, Oncternal and/or its licensors may be required to file infringement claims, which can be expensive and time consuming. In addition, in a patent infringement proceeding, a court may decide that a patent Oncternal owns or licenses is not valid, is unenforceable and/or is not infringed. If Oncternal or any of its licensors or potential future collaborators were to initiate legal proceedings against a third-party to enforce a patent directed at one of Oncternal's product candidates, the defendant could counterclaim that Oncternal's or its licensor's patent is invalid and/or unenforceable in whole or in part. In patent litigation, defendant counterclaims alleging invalidity and/or unenforceability are commonplace. Grounds for a validity challenge include an alleged failure to meet any of several statutory requirements, including lack of novelty, obviousness, lack of written description or non-enablement. Grounds for an unenforceability assertion could include an allegation that someone connected with prosecution of the patent withheld relevant information from the USPTO or made a misleading statement during prosecution.

If a defendant were to prevail on a legal assertion of invalidity and/or unenforceability, Oncternal would lose at least part, and perhaps all, of the patent protection on such product candidate. In addition, if the breadth or strength of protection provided by Oncternal's patents and patent applications or those of its licensors is threatened, it could dissuade companies from collaborating with Oncternal to license, develop or commercialize current or future product candidates. Such a loss of patent protection would have a material adverse impact on Oncternal's business.

Even if resolved in Oncternal's favor, litigation or other legal proceedings relating to Oncternal's or its licensor's intellectual property rights may cause Oncternal to incur significant expenses, and could distract Oncternal's technical and management personnel from their normal responsibilities. Such litigation or proceedings could substantially increase Oncternal's operating losses and reduce the resources available for development activities or any future sales, marketing or distribution activities. Oncternal or its licensor may not have sufficient financial or other resources to conduct or participate in such litigation or proceedings adequately. Some of Oncternal's

competitors may be able to sustain the costs of such litigation or proceedings more effectively than Oncternal or its licensor can because of their greater financial resources. Uncertainties resulting from the initiation and continuation of patent litigation or other proceedings could compromise Oncternal's ability to compete in the marketplace.

Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation or other legal proceedings relating to Oncternal's intellectual property rights, there is a risk that some of Oncternal's confidential information could be compromised by disclosure during this type of litigation or other proceedings.

Intellectual property litigation may lead to unfavorable publicity that harms Oncternal's reputation and causes the market price of Oncternal's common shares to decline.

During the course of any intellectual property litigation, there could be public announcements of the initiation of the litigation as well as results of hearings, rulings on motions, and other interim proceedings in the litigation. If securities analysts or investors regard these announcements as negative, the perceived value of Oncternal's existing products, programs or intellectual property could be diminished. Accordingly, the market price of shares of Oncternal's common stock may decline. Such announcements could also harm Oncternal's reputation or the market for Oncternal's future products, which could have a material adverse effect on Oncternal's business.

Derivation or interference proceedings may be necessary to determine priority of inventions, and an unfavorable outcome may require Oncternal to cease using the related technology or to attempt to license rights from the prevailing party.

Derivation or interference proceedings provoked by third parties or brought by Oncternal or its licensors or declared by the USPTO or similar proceedings in foreign patent offices may be necessary to determine the priority of inventions with respect to Oncternal's or its licensor's patents or patent applications. An unfavorable outcome could require Oncternal to cease using the related technology or to attempt to license rights to it from the prevailing party. Oncternal's business could be harmed if the prevailing party does not offer Oncternal a license on commercially reasonable terms. Oncternal's or its licensor's defense of such proceedings may fail and, even if successful, may result in substantial costs and distract Oncternal's management and other employees. In addition, the uncertainties associated with such proceedings could have a material adverse effect on Oncternal's ability to raise the funds necessary to continue its clinical trials, continue its research programs, license necessary technology from third parties or enter into development or manufacturing partnerships that would help Oncternal bring its product candidates to market.

Recent patent reform legislation could increase the uncertainties and costs surrounding the prosecution of Oncternal's patent applications and the enforcement or defense of Oncternal's issued patents.

On September 16, 2011, the Leahy-Smith America Invents Act, or Leahy-Smith Act, was signed into law. The Leahy-Smith Act includes a number of significant changes to U.S. patent law. These include provisions that affect the way patent applications will be prosecuted and may also affect patent litigation. In particular, under the Leahy-Smith Act, the United States transitioned in March 2013 to a "first inventor to file" system in which, assuming that other requirements of patentability are met, the first inventor to file a patent application will be entitled to the patent regardless of whether a third-party was first to invent the claimed invention. A third-party that files a patent application in the USPTO after March 2013 but before Oncternal could therefore be awarded a patent covering an invention of Oncternal's even if Oncternal had made the invention before it was made by such third-party. This will require Oncternal to be cognizant going forward of the time from invention to filing of a patent application. Furthermore, Oncternal's ability to obtain and maintain valid and enforceable patents depends on whether the differences between Oncternal's technology and the prior art allow Oncternal's technology to be patentable over the prior art. Since patent applications in the United States and most other countries are confidential for a period of time after filing or until issuance, Oncternal cannot be certain that it or its licensor

was the first to either (1) file any patent application related to Oncternal's product candidates or (2) invent any of the inventions claimed in Oncternal's or its licensor's patents or patent applications.

The Leahy-Smith Act also includes a number of significant changes that affect the way patent applications will be prosecuted and also may affect patent litigation. These include allowing third-party submission of prior art to the USPTO during patent prosecution and additional procedures to attack the validity of a patent by USPTO administered post-grant proceedings, including PGR, IPR, and derivation proceedings. An adverse determination in any such submission or proceeding could reduce the scope or enforceability of, or invalidate, Oncternal's patent rights, which could adversely affect Oncternal's competitive position.

Because of a lower evidentiary standard in USPTO proceedings compared to the evidentiary standard in United States federal courts necessary to invalidate a patent claim, a third-party could potentially provide evidence in a USPTO proceeding sufficient for the USPTO to hold a claim invalid even though the same evidence would be insufficient to invalidate the claim if first presented in a district court action. Accordingly, a third-party may attempt to use the USPTO procedures to invalidate Oncternal's or its licensor's patent claims that would not have been invalidated if first challenged by the third-party as a defendant in a district court action. Thus, the Leahy-Smith Act and its implementation could increase the uncertainties and costs surrounding the prosecution of Oncternal's or its licensor's patent applications and the enforcement or defense of Oncternal's or its licensor's issued patents, all of which could have a material adverse effect on Oncternal's business, financial condition, results of operations and prospects.

Changes in U.S. patent law, or laws in other countries, could diminish the value of patents in general, thereby impairing Oncternal's ability to protect its product candidates.

As is the case with other biopharmaceutical companies, Oncternal's success is heavily dependent on intellectual property, particularly patents. Obtaining and enforcing patents in the biopharmaceutical industry involve a high degree of technological and legal complexity. Therefore, obtaining and enforcing biopharmaceutical patents is costly, time consuming and inherently uncertain. Changes in either the patent laws or in the interpretations of patent laws in the United States and other countries may diminish the value of Oncternal's intellectual property rights and may increase the uncertainties and costs surrounding the prosecution of patent applications and the enforcement or defense of issued patents. Oncternal cannot predict the breadth of claims that may be allowed or enforced in Oncternal's or its licensor's patents or in third-party patents. In addition, Congress or other foreign legislative bodies may pass patent reform legislation that is unfavorable to Oncternal.

For example, the U.S. Supreme Court has ruled on several patent cases in recent years, either narrowing the scope of patent protection available in certain circumstances or weakening the rights of patent owners in certain situations. In addition to increasing uncertainty with regard to Oncternal's and its licensor's ability to obtain patents in the future, this combination of events has created uncertainty with respect to the value of patents, once obtained. Depending on decisions by the U.S. Congress, the U.S. federal courts, the USPTO, or similar authorities in foreign jurisdictions, the laws and regulations governing patents could change in unpredictable ways that would weaken Oncternal's or its licensor's ability to obtain new patents or to enforce its existing patents and patents it might obtain in the future.

Oncternal may be subject to claims challenging the inventorship or ownership of Oncternal's patents and other intellectual property.

Oncternal may also be subject to claims that former employees or other third parties have an ownership interest in Oncternal's patents or other intellectual property. Litigation may be necessary to defend against these and other claims challenging inventorship or ownership. If Oncternal fails in defending any such claims, in addition to paying monetary damages, Oncternal may lose valuable intellectual property rights. Such an outcome could have a material adverse effect on Oncternal's business. Even if Oncternal is successful in defending against such claims, litigation could result in substantial costs and distraction to management and other employees.

Patent terms may be inadequate to protect Oncternal's competitive position on its product candidates for an adequate amount of time.

Patents have a limited lifespan. In the United States, if all maintenance fees are timely paid, the natural expiration of a patent is generally 20 years from its earliest U.S. non-provisional filing date. Various extensions may be available, but the life of a patent, and the protection it affords, is limited. Even if patents covering Oncternal's product candidates are obtained, once the patent life has expired, Oncternal may be open to competition from competitive products. Given the amount of time required for the development, testing and regulatory review of product candidates, patents protecting Oncternal's product candidates might expire before or shortly after such candidates are commercialized. As a result, Oncternal's patent portfolio may not provide it with sufficient rights to exclude others from commercializing products similar or identical to Oncternal's.

If Oncternal does not obtain patent term extension for its product candidates, its business may be materially harmed.

Depending upon the timing, duration and specifics of FDA marketing approval of Oncternal's product candidates, one or more of its or its licensor's U.S. patents may be eligible for limited patent term restoration under the Drug Price Competition and Patent Term Restoration Act of 1984 (the "Hatch-Waxman Amendments"). The Hatch- Waxman Amendments permit a patent restoration term of up to five years as compensation for patent term lost during product development and the FDA regulatory review process. A maximum of one patent may be extended per FDA approved product as compensation for the patent term lost during the FDA regulatory review process. A patent term extension cannot extend the remaining term of a patent beyond a total of 14 years from the date of product approval and only those claims covering such approved drug product, a method for using it or a method for manufacturing it may be extended. Patent term extension may also be available in certain foreign countries upon regulatory approval of Oncternal's product candidates. However, Oncternal may not be granted an extension because of, for example, failing to apply within applicable deadlines, failing to apply prior to expiration of relevant patents or otherwise failing to satisfy applicable requirements. Moreover, the applicable time period or the scope of patent protection afforded could be less than it requests. If Oncternal is unable to obtain patent term extension or restoration or the term of any such extension is less than Oncternal requests, its competitors may obtain approval of competing products following Oncternal's or its licensor's patent expiration, and Oncternal's revenue could be reduced, possibly materially. Further, if this occurs, Oncternal's competitors may take advantage of its investment in development and trials by referencing Oncternal's clinical and preclinical data and launch their product earlier than might otherwise be the case.

Oncternal may not be able to protect its intellectual property rights throughout the world.

Although Oncternal and its licensors have issued patents and pending patent applications in the United States and certain other countries, filing, prosecuting and defending patents in all countries throughout the world would be prohibitively expensive, and Oncternal's intellectual property rights in some countries outside the United States can be less extensive than those in the United States. In addition, the laws of some foreign countries do not protect intellectual property rights to the same extent as federal and state laws in the United States. Consequently, Oncternal may not be able to prevent third parties from practicing Oncternal's inventions in all countries outside the United States or from selling or importing products made using Oncternal's inventions in and into the United States or other jurisdictions. Competitors may use Oncternal's technologies in jurisdictions where Oncternal or its licensor has not obtained patent protection to develop their own products and, further, may export otherwise infringing products to territories where Oncternal has patent protection but enforcement is not as strong as that in the United States. These products may compete with Oncternal's product candidates, and Oncternal's and its licensor's patents or other intellectual property rights may not be effective or sufficient to prevent them from competing.

Many companies have encountered significant problems in protecting and defending intellectual property rights in foreign jurisdictions. The legal systems of many foreign countries do not favor the enforcement of patents and

other intellectual property protection, which could make it difficult for Oncternal to stop the infringement of its patents or marketing of competing products in violation of Oncternal's proprietary rights. Proceedings to enforce Oncternal's patent rights in foreign jurisdictions could result in substantial costs and divert Oncternal's efforts and attention from other aspects of its business, could put its patents at risk of being invalidated or interpreted narrowly and its patent applications at risk of not issuing and could provoke third parties to assert claims against Oncternal. Oncternal or its licensor may not prevail in any lawsuits that it initiates, and the damages or other remedies awarded, if any, may not be commercially meaningful. Accordingly, Oncternal's or its licensor's efforts to enforce its intellectual property rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property that Oncternal develops or licenses.

Many countries have compulsory licensing laws under which a patent owner may be compelled to grant licenses to third parties. In addition, many countries limit the enforceability of patents against government agencies or government contractors. In these countries, the patent owner may have limited remedies, which could materially diminish the value of such patent. If Oncternal or its licensor is forced to grant a license to third parties with respect to any patents relevant to Oncternal's business, Oncternal's competitive position may be impaired, and its business, financial condition, results of operations and prospects may be adversely affected.

Obtaining and maintaining Oncternal's patent protection depends on compliance with various procedural, documentary, fee payment and other requirements imposed by regulations and governmental patent agencies, and Oncternal's patent protection could be reduced or eliminated for non-compliance with these requirements.

Periodic maintenance fees, renewal fees, annuity fees and various other governmental fees on patents and/or applications will be due to the USPTO and various foreign patent offices at various points over the lifetime of Oncternal's and its licensors' patents and/or applications. Oncternal has systems in place to remind it to pay these fees, and Oncternal relies on third parties to pay these fees when due. Additionally, the USPTO and various foreign patent offices require compliance with a number of procedural, documentary, fee payment and other similar provisions during the patent application process. Oncternal employs reputable law firms and other professionals to help it comply, and in many cases, an inadvertent lapse can be cured by payment of a late fee or by other means in accordance with rules applicable to the particular jurisdiction. However, there are situations in which noncompliance can result in abandonment or lapse of the patent or patent application, resulting in partial or complete loss of patent rights in the relevant jurisdiction. If such an event were to occur, it could have a material adverse effect on Oncternal's business.

If Oncternal is unable to protect the confidentiality of its trade secrets, its business and competitive position would be harmed.

In addition, Oncternal relies on the protection of its trade secrets, including unpatented know-how, technology and other proprietary information to maintain Oncternal's competitive position. Although Oncternal has taken steps to protect its trade secrets and unpatented know-how, including entering into confidentiality agreements with third parties, and confidential information and inventions agreements with employees, consultants and advisors, Oncternal cannot provide any assurances that all such agreements have been duly executed, and any of these parties may breach the agreements and disclose Oncternal's proprietary information, including its trade secrets, and Oncternal may not be able to obtain adequate remedies for such breaches. Enforcing a claim that a party illegally disclosed or misappropriated a trade secret is difficult, expensive and time consuming, and the outcome is unpredictable. In addition, some courts inside and outside the United States are less willing or unwilling to protect trade secrets.

Moreover, third parties may still obtain this information or may come upon this or similar information independently, and Oncternal would have no right to prevent them from using that technology or information to compete with Oncternal. If any of these events occurs or if Oncternal otherwise loses protection for its trade secrets, the value of this information may be greatly reduced and Oncternal's competitive position would be

harmed. If Oncternal does not apply for patent protection prior to such publication or if Oncternal cannot otherwise maintain the confidentiality of its proprietary technology and other confidential information, then Oncternal's ability to obtain patent protection or to protect its trade secret information may be jeopardized.

Oncternal may be subject to claims that it has wrongfully hired an employee from a competitor or that Oncternal or its employees have wrongfully used or disclosed alleged confidential information or trade secrets of their former employers.

As is common in the biopharmaceutical industry, in addition to Oncternal's employees, Oncternal engages the services of consultants to assist it in the development of its product candidates. Many of these consultants, and many of Oncternal's employees, were previously employed at, or may have previously provided or may be currently providing consulting services to, other biopharmaceutical companies including Oncternal's competitors or potential competitors. Oncternal may become subject to claims that Oncternal, its employees or a consultant inadvertently or otherwise used or disclosed trade secrets or other information proprietary to their former employers or their former or current clients. Litigation may be necessary to defend against these claims. If Oncternal fails in defending any such claims, in addition to paying monetary damages, it may lose valuable intellectual property rights or personnel, which could adversely affect Oncternal's business. Even if Oncternal is successful in defending against these claims, litigation could result in substantial costs and be a distraction to Oncternal's management team and other employees.

Risks Related to Oncternal's Common Stock

An active, liquid and orderly market for the combined company's common stock may not develop, and you may not be able to resell your common stock at or above the purchase price.

There has been no public market for Oncternal's common stock. Although GTx's common stock is listed on the Nasdaq Capital Market, or Nasdaq, and Oncternal and GTx have applied to have the combined company's common stock listed on Nasdaq, an active trading market for the combined company's common stock may never develop or be sustained following the merger. Oncternal, GTx and their financial advisors will set the final reverse split ratio to target a trading price to provide for sufficient liquidity. The price that the combined company trades at immediately after the merger may not necessarily reflect the price at which investors in the market will be willing to buy and sell the shares on a sustained basis. In addition, an active trading market may not develop following the consummation of the merger or, if it is developed, may not be sustained. The lack of an active market may impair your ability to sell your shares at the time you wish to sell them or at a price that you consider reasonable. An inactive market may also impair the combined company's ability to raise capital by selling shares and may impair the combined company's ability to acquire other businesses or technologies using the combined company's shares as consideration, which, in turn, could materially adversely affect the combined company's business.

The trading price of the shares of the combined company's common stock could be highly volatile, and purchasers of the combined company's common stock after the merger could incur substantial losses.

The combined company's stock price is likely to be volatile. The stock market in general and the market for stock of biopharmaceutical companies in particular have experienced extreme volatility that has often been unrelated to the operating performance of particular companies. As a result of this volatility, investors may not be able to sell their common stock at or above their purchase price. The market price for the combined company's common stock may be influenced by those factors discussed in this "Risk Factors" section and many others, including:

- the combined company's ability to enroll subjects in its ongoing and planned clinical trials;
- results of the combined company's clinical trials and preclinical studies, and the results of trials of the combined company's competitors or those of other companies in the combined company's market sector;

- regulatory approval of the combined company's product candidates, or limitations to specific label indications or patient populations for its use, or changes or delays in the regulatory review process;
- regulatory developments in the United States and foreign countries;
- changes in the structure of healthcare payment systems, especially in light of current reforms to the U.S. healthcare system;
- the success or failure of the combined company's efforts to acquire, license or develop additional product candidates;
- innovations or new products developed by the combined company's or its competitors;
- announcements by the combined company or its competitors of significant acquisitions, strategic partnerships, joint ventures or capital commitments;
- manufacturing, supply or distribution delays or shortages;
- any changes to the combined company's relationship with any manufacturers, suppliers, licensors, future collaborators or other strategic partners;
- achievement of expected product sales and profitability;
- variations in the combined company's financial results or those of companies that are perceived to be similar to the combined company;
- market conditions in the biopharmaceutical sector and issuance of securities analysts' reports or recommendations;
- trading volume of the combined company's common stock;
- an inability to obtain additional funding;
- sales of the combined company's stock by insiders and stockholders;
- general economic, industry and market conditions other events or factors, many of which are beyond the combined company's control;
- additions or departures of key personnel; and
- intellectual property, product liability or other litigation against the combined company.

In addition, in the past, stockholders have initiated class action lawsuits against biopharmaceutical companies following periods of volatility in the market prices of these companies' stock. Such litigation, if instituted against the combined company, could cause Oncternal to incur substantial costs and divert management's attention and resources, which could have a material adverse effect on the combined company's business, financial condition and results of operations.

The combined company's failure to meet the continued listing requirements of the Nasdaq could result in a delisting of the combined company's common stock.

If, after listing, the combined company fails to satisfy the continued listing requirements of the Nasdaq, such as the corporate governance requirements or the minimum closing bid price requirement, Nasdaq may take steps to delist the combined company's common stock. Such a delisting would likely have a negative effect on the price of the combined company's common stock and would impair your ability to sell or purchase the combined company's common stock when you wish to do so. In the event of a delisting, the combined company can provide no assurance that any action taken by the combined company to restore compliance with listing requirements would allow the combined company's common stock to become listed again, stabilize the market price or improve the liquidity of the combined company's common stock, prevent the combined company's common stock from dropping below the Nasdaq minimum bid price requirement or prevent future non-compliance with Nasdaq's listing requirements.

After the merger, the combined company's executive officers, directors and principal stockholders, if they choose to act together, will continue to control or significantly influence all matters submitted to stockholders for approval. Furthermore, two of the combined company's anticipated directors will be appointed by one of Oncternal's principal stockholders.

Following the completion of the merger, the combined company's executive officers, directors and greater than 5% stockholders, in the aggregate, will own approximately 37.7% of Oncternal's outstanding common stock (assuming no exercise of outstanding options). Furthermore, two of the combined company's anticipated directors will be appointed by the combined company's largest stockholder, SPH USA. As a result, such persons or their appointees to the combined company's board of directors, acting together, will have the ability to control or significantly influence all matters submitted to the combined company's board of directors or stockholders for approval, including the appointment of the combined company's management, the election and removal of directors and approval of any significant transaction, as well as the combined company's management and business affairs. This concentration of ownership may have the effect of delaying, deferring or preventing a change in control, impeding a merger, consolidation, takeover or other business combination involving the combined company, or discouraging a potential acquiror from making a tender offer or otherwise attempting to obtain control of the combined company's business, even if such a transaction would benefit other stockholders.

Oncternal does not currently intend to pay dividends on the combined company's common stock, and, consequently, your ability to achieve a return on your investment will depend on appreciation, if any, in the price of the combined company's common stock.

Oncternal has never declared or paid any cash dividend on Oncternal's common stock. Oncternal currently anticipates that it will retain future earnings for the development, operation and expansion of the combined company's business and does not anticipate declaring or paying any cash dividends for the foreseeable future. In addition, the terms of any future debt agreements may preclude the combined company from paying dividends. Any return to stockholders will therefore be limited to the appreciation of their stock. There is no guarantee that shares of the combined company's common stock will appreciate in value or even maintain the price at which stockholders have purchased their shares.

Sales of a substantial number of shares of the combined company's common stock by the combined company's stockholders in the public market could cause the combined company's stock price to fall.

Sales of a substantial number of shares of the combined company's common stock in the public market or the perception that these sales might occur could significantly reduce the market price of the combined company's common stock and impair the combined company's ability to raise adequate capital through the sale of additional equity securities.

Based on shares of GTx's common stock outstanding and issuable under the GTx Director Deferred Compensation Plan as of March 31, 2019 and assuming an exchange ratio of 0.4474, upon the closing of the merger, the combined company will have outstanding a total of 96,829,080 shares of common stock after the merger, assuming no exercise of outstanding options. Of these shares, only 54,150,550 shares of common stock will be freely tradable, without restriction, in the public market immediately following the merger, unless they are purchased by one of the combined company's affiliates.

Oncternal's directors and executive officers and holders of approximately 43.7% of Oncternal's outstanding securities have entered into lock-up agreements with GTx pursuant to which they may not, with limited exceptions, for a period of 180 days from the date of the Effective Time, offer, sell or otherwise transfer or dispose of any of the GTx's securities, without the prior written consent of GTx, subject to certain exceptions. Sales of these shares, or perceptions that they will be sold, could cause the trading price of the combined company's common stock to decline. After the lock-up agreements expire, up to an additional 42,678,530 shares of common stock will be eligible for sale in the public market.

In addition, as of March 31, 2019, up to shares of common stock that are either subject to outstanding options or reserved for future issuance under GTx's equity incentive plans will become eligible for sale in the public market to the extent permitted by the provisions of various vesting schedules, the lock-up agreements and Rule 144 and Rule 701 under the Securities Act. If these additional shares of common stock are sold, or if it is perceived that they will be sold, in the public market, the trading price of the combined company's common stock could decline.

After the merger, the holders of shares of GTx's outstanding common stock, or approximately % of GTx's total outstanding common stock as of March 31, 2019, will be entitled to rights with respect to the registration of their shares under the Securities Act, subject to vesting and the 180-day lock-up agreements described above. See "Description of GTx's Capital Stock—Registration Rights." Registration of these shares under the Securities Act would result in the shares becoming freely tradable without restriction under the Securities Act, except for shares held by affiliates, as defined in Rule 144 under the Securities Act. Any sales of securities by these stockholders could have a material adverse effect on the trading price of the combined company's common stock.

Oncternal will incur significant increased costs as a result of operating as a public company, and its management will be required to devote substantial time to new compliance initiatives.

As a public company, Oncternal will incur significant legal, accounting and other expenses that Oncternal did not incur as a private company. Oncternal will be subject to the reporting requirements of the Exchange Act, which will require, among other things, that Oncternal files with the U.S. Securities and Exchange Commission, or SEC, annual, quarterly and current reports with respect to Oncternal's business and financial condition. In addition, Sarbanes-Oxley, as well as rules subsequently adopted by the SEC and Nasdaq to implement provisions of Sarbanes-Oxley, impose significant requirements on public companies, including requiring establishment and maintenance of effective disclosure and financial controls and changes in corporate governance practices. Further, pursuant to the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, the SEC has adopted additional rules and regulations in these areas, such as mandatory "say on pay" voting requirements that will apply to Oncternal when it ceases to be an emerging growth company. Stockholder activism, the current political environment and the current high level of government intervention and regulatory reform may lead to substantial new regulations and disclosure obligations, which may lead to additional compliance costs and impact the manner in which Oncternal operates its business in ways Oncternal cannot currently anticipate.

Oncternal expects the rules and regulations applicable to public companies to substantially increase Oncternal's legal and financial compliance costs and to make some activities more time consuming and costly. If these requirements divert the attention of Oncternal's management and personnel from other business concerns, they could have a material adverse effect on Oncternal's business, financial condition and results of operations. The increased costs will increase Oncternal's net loss, and may require Oncternal to reduce costs in other areas of its business or increase the prices of its products or services. For example, Oncternal expects these rules and regulations to make it more difficult and more expensive for Oncternal to obtain director and officer liability insurance, and Oncternal may be required to incur substantial costs to maintain the same or similar coverage. Oncternal cannot predict or estimate the amount or timing of additional costs Oncternal may incur to respond to these requirements. The impact of these requirements could also make it more difficult for Oncternal to attract and retain qualified persons to serve on its board of directors, its board committees or as executive officers.

If securities or industry analysts do not publish research or reports or publish unfavorable research or reports about the combined company's business, the combined company's stock price and trading volume could decline.

The trading market for the combined company's common stock will depend in part on the research and reports that securities or industry analysts publish about the combined company, its business, its market or its competitors. Oncternal does not currently have and may never obtain research coverage by securities and

industry analysts. If no securities or industry analysts commence coverage of the combined company, the trading price for the combined company's stock would be negatively impacted. In the event the combined company obtains securities or industry analyst coverage, if one or more of the analysts who covers the combined company downgrades its stock, the combined company's stock price would likely decline. If one or more of these analysts ceases to cover the combined company or fails to regularly publish reports on the combined company, interest in the combined company's stock could decrease, which could cause the combined company's stock price or trading volume to decline.

If the combined company fails to maintain proper and effective internal control over financial reporting, Oncternal's ability to produce accurate and timely financial statements could be impaired, investors may lose confidence in the combined company's financial reporting and the trading price of the combined company's common stock may decline.

Pursuant to Section 404 of Sarbanes-Oxley, the combined company's management will be required to report upon the effectiveness of the combined company's internal control over financial reporting beginning with the annual report for the combined company's fiscal year ending December 31, 2019. Additionally, if the combined company reaches an accelerated filer threshold, the combined company's independent registered public accounting firm will be required to attest to the effectiveness of the combined company's internal control over financial reporting. The rules governing the standards that must be met for management to assess the combined company's internal control over financial reporting are complex and require significant documentation, testing and possible remediation. To comply with the requirements of being a reporting company under the Exchange Act, the combined company will need to upgrade its information technology systems; implement additional financial and management controls, reporting systems and procedures; and hire additional accounting and finance staff. If the combined company or, if required, its auditors are unable to conclude that the combined company's internal control over financial reporting is effective, investors may lose confidence in the combined company's financial reporting and the trading price of the combined company's common stock may decline.

The combined company cannot assure you that there will not be material weaknesses or significant deficiencies in the combined company's internal control over financial reporting in the future. Any failure to maintain internal control over financial reporting could severely inhibit the combined company's ability to accurately report its financial condition, results of operations or cash flows. If the combined company is unable to conclude that its internal control over financial reporting is effective, or if the combined company's independent registered public accounting firm determines the combined company has a material weakness or significant deficiency in the combined company's internal control over financial reporting once that firm begin its Section 404 reviews, investors may lose confidence in the accuracy and completeness of the combined company's financial reports, the market price of the combined company's common stock could decline, and the combined company could be subject to sanctions or investigations by Nasdaq, the SEC or other regulatory authorities. Failure to remedy any material weakness in the combined company's internal control over financial reporting, or to implement or maintain other effective control systems required of public companies, could also restrict the combined company's future access to the capital markets.

Provisions in the combined company's charter documents and under Delaware law could discourage a takeover that stockholders may consider favorable and may lead to entrenchment of management.

The anticipated amended and restated certificate of incorporation and amended and restated bylaws of the combined company that will be in effect immediately after consummation of the merger will contain provisions that could significantly reduce the value of the combined company's shares to a potential acquiror or delay or prevent changes in control or changes in the combined company's management without the consent of the combined company's board of directors. The provisions in the combined company's charter documents are expected to include the following:

- a classified board of directors with three-year staggered terms, which may delay the ability of stockholders to change the membership of a majority of the combined company's board of directors;

- no cumulative voting in the election of directors, which limits the ability of minority stockholders to elect director candidates;
- the exclusive right of the combined company's board of directors, unless the board of directors grants such right to the stockholders, to elect a director to fill a vacancy created by the expansion of the board of directors or the resignation, death or removal of a director, which prevents stockholders from being able to fill vacancies on the combined company's board of directors;
- the prohibition on removal of directors without cause due to the classified board of directors;
- the ability of the combined company's board of directors to authorize the issuance of shares of preferred stock and to determine the price and other terms of those shares, including preferences and voting rights, without stockholder approval, which could be used to significantly dilute the ownership of a hostile acquiror;
- the ability of the combined company's board of directors to alter Oncternal's amended and restated bylaws without obtaining stockholder approval;
- the required approval of at least 66-2/3% of the shares entitled to vote to adopt, amend or repeal the combined company's amended and restated bylaws or repeal certain provisions of the combined company's amended and restated certificate of incorporation;
- a prohibition on stockholder action by written consent, which forces stockholder action to be taken at an annual or special meeting of Oncternal's stockholders;
- an exclusive forum provision providing that the Court of Chancery of the State of Delaware will be the exclusive forum for certain actions and proceedings;
- the requirement that a special meeting of stockholders may be called only by the chairman of the board of directors, the chief executive officer or the board of directors, which may delay the ability of the combined company's stockholders to force consideration of a proposal or to take action, including the removal of directors; and
- advance notice procedures that stockholders must comply with in order to nominate candidates to the combined company's board of directors or to propose matters to be acted upon at a stockholders' meeting, which may discourage or deter a potential acquiror from conducting a solicitation of proxies to elect the acquiror's own slate of directors or otherwise attempting to obtain control of the combined company.

The combined company is also subject to the anti-takeover provisions contained in Section 203 of the Delaware General Corporation Law. Under Section 203, a corporation may not, in general, engage in a business combination with any holder of 15% or more of its capital stock unless the holder has held the stock for three years or, among other exceptions, the board of directors has approved the transaction.

The combined company's amended and restated bylaws will provide that the Court of Chancery of the State of Delaware will be the exclusive forum for substantially all disputes between the combined company and its stockholders, which could limit the combined company's stockholders' ability to obtain a favorable judicial forum for disputes with the combined company or its directors, officers or employees.

The combined company's amended and restated bylaws will provide that the Court of Chancery of the State of Delaware is the exclusive forum for any derivative action or proceeding brought on the combined company's behalf, any action asserting a breach of fiduciary duty, any action asserting a claim against the combined company arising pursuant to the Delaware General Corporation Law, the combined company's amended and restated certificate of incorporation or the combined company's amended and restated bylaws, or any action asserting a claim against the combined company that is governed by the internal affairs doctrine. These choice of forum provisions may limit a stockholder's ability to bring a claim in a judicial forum that it finds favorable for

disputes with the combined company or its directors, officers or other employees, which may discourage such lawsuits against the combined company and its directors, officers and other employees. By agreeing to this provision, however, stockholders will not be deemed to have waived the combined company's compliance with the federal securities laws and the rules and regulations thereunder. Furthermore, the enforceability of similar choice of forum provisions in other companies' certificates of incorporation has been challenged in legal proceedings, and it is possible that a court could find these types of provisions to be inapplicable or unenforceable. If a court were to find the choice of forum provisions in the combined company's amended and restated bylaws to be inapplicable or unenforceable in an action, the combined company may incur additional costs associated with resolving such action in other jurisdictions, which could adversely affect the combined company's business and financial condition.

If the merger does not qualify as a "reorganization" for U.S. federal income tax purposes, U.S. Holders of Oncternal common stock will be required to recognize gain or loss for U.S. federal income tax purposes upon the exchange of their Oncternal common stock for GTx common stock in the merger.

The U.S. federal income tax consequences of the merger to U.S. Holders (as defined under the heading "The Merger—Material U.S. Federal Income Tax Consequences of the Merger") will depend on whether the merger qualifies as a "reorganization" for U.S. federal income tax purposes. GTx's and Oncternal's obligations to effect the merger are subject to the satisfaction, or waiver, at or prior to the effective time of the merger, of the condition that each company receive an opinion of counsel, dated as of the closing date of the merger, to the effect that the merger will qualify as a "reorganization" within the meaning of Section 368(a) of the Code. If, contrary to the opinions from counsel, the merger fails to qualify as a reorganization within the meaning of Section 368(a) of the Code, a U.S. Holder of Oncternal common stock would recognize gain or loss for U.S. federal income tax purposes on each share of Oncternal common stock surrendered in the merger for GTx common stock and any cash received in lieu of a fractional share. For a more complete discussion of the material U.S. federal income tax consequences of the merger, please carefully review the information set forth in the section entitled "The Merger—Material U.S. Federal Income Tax Consequences of the Merger."

Oncternal's ability to use net operating loss carryforwards and other tax attributes may be limited in connection with the merger and other ownership changes.

Oncternal has incurred substantial losses during its history and does not expect to become profitable in the near future, and Oncternal may never achieve profitability. To the extent that Oncternal continues to generate taxable losses, unused losses will carry forward to offset future taxable income, if any, until such unused losses expire (if at all). At December 31, 2018, Oncternal had federal and state NOL carryforwards of approximately $29.7 million. Such federal and state NOL carryforwards will begin to expire in 2033, unless previously utilized. At December 31, 2018, Oncternal had federal and state research and development credit carryforwards of approximately $0.9 million and $0.5 million, respectively. The federal research and development credit carryforwards will begin expiring in 2034, unless previously utilized. The state research and development credits do not expire.

Under the Tax Act, federal NOLs generated in taxable years ending after December 31, 2017, may be carried forward indefinitely but federal NOLs generated in taxable years beginning after December 31, 2017 may only be used to offset 80% of Oncternal's taxable income annually. Oncternal's NOL carryforwards are subject to review and possible adjustment by the IRS and state tax authorities. Under Sections 382 and 383 of the Code, Oncternal's federal NOL and research and development tax credit carryforwards may become subject to an annual limitation in the event of certain cumulative changes in the ownership interest of significant stockholders over a three-year period in excess of 50 percentage points. Oncternal's ability to utilize its NOL carryforwards and other tax attributes to offset future taxable income or tax liabilities may be limited as a result of ownership changes, including in connection with the merger. Similar rules may apply under state tax laws. Oncternal has not yet determined the amount of the cumulative change in its ownership resulting from the merger or other transactions, or any resulting limitations on its ability to utilize its NOL carryforwards and other tax attributes. If

Oncternal earns taxable income, such limitations could result in increased future tax liability to Oncternal and its future cash flows could be adversely affected. Oncternal has recorded a full valuation allowance related to its NOLs and other deferred tax assets due to the uncertainty of the ultimate realization of the future benefits of those assets.

U.S. tax legislation may materially adversely affect Oncternal's financial condition, results of operations and cash flows.

The Tax Act has significantly changed the U.S. federal income taxation of U.S. corporations, including by reducing the U.S. corporate income tax rate and revising the rules governing NOLs. Many of these changes became effective beginning in 2018, without any transition periods or grandfathering for existing transactions. The legislation is unclear in many respects and could be subject to potential amendments and technical corrections, as well as interpretations and implementing regulations by the U.S. Treasury Department and the IRS, any of which could lessen or increase certain adverse impacts of the legislation. In addition, it is unclear how these U.S. federal income tax changes will affect state and local taxation, which often uses federal taxable income as a starting point for computing state and local tax liabilities. As a result of the rate reduction from the Tax Act, Oncternal has reduced its deferred tax asset balance as of December 31, 2017 by $2.8 million. However, due to Oncternal's full valuation allowance position, there was no net impact on Oncternal's income tax provision at December 31, 2017, as the reduction in the deferred tax asset balance was fully offset by a corresponding decrease in the valuation allowance.

There may be other material adverse effects resulting from the legislation that Oncternal has not yet identified. While some of the changes made by the tax legislation may adversely affect Oncternal in one or more reporting periods and prospectively, other changes may be beneficial on a going forward basis. Oncternal continues to work with its tax advisors to determine the full impact that the recent tax legislation as a whole will have on Oncternal. Oncternal urges its investors to consult with their legal and tax advisors with respect to such legislation.

The combined company could be subject to securities class action litigation.

In the past, securities class action litigation has often been brought against a company following a decline in the market price of its securities. This risk is especially relevant for the combined company, because biotechnology and pharmaceutical companies have experienced significant stock price volatility in recent years. If the combined company faces such litigation, it could result in substantial costs and a diversion of management's attention and resources, which could harm the combined company's business.

FORWARD-LOOKING STATEMENTS

This proxy statement/prospectus/information statement and the documents incorporated by reference into this proxy statement/prospectus/information statement contain forward-looking statements (including within the meaning of Section 21E of the United States Securities Exchange Act of 1934, as amended (the "Exchange Act"), and Section 27A of the United States Securities Act of 1933, as amended (the "Securities Act")) concerning GTx, Oncternal, the merger and other matters. These statements may discuss goals, intentions and expectations as to future plans, trends, events, results of operations or financial condition, or otherwise, based on current beliefs of the management of GTx, as well as assumptions made by, and information currently available to, management. Forward-looking statements generally include statements that are predictive in nature and depend upon or refer to future events or conditions, and include words such as "may," "will," "should," "would," "expect," "plan," "believe," "intend," "look forward," and other similar expressions among others. Statements that are not historical facts are forward-looking statements. Forward-looking statements are based on current beliefs and assumptions that are subject to risks and uncertainties and are not guarantees of future performance. Actual results and the timing of events could differ materially from those anticipated in such forward-looking statements as a result of these risks and uncertainties, which include, without limitation: (i) the risk that the conditions to the closing of the merger are not satisfied, including the failure to timely obtain stockholder approval for the transaction, if at all; (ii) uncertainties as to the timing of the consummation of the merger and the ability of each of GTx and Oncternal to consummate the merger; (iii) risks related to GTx's ability to manage its operating expenses and its expenses associated with the merger pending closing; (iv) risks related to the failure or delay in obtaining required approvals from any governmental or quasi-governmental entity necessary to consummate the merger; (v) the risk that as a result of adjustments to the exchange ratio, GTx stockholders and Oncternal stockholders could own more or less of the combined company than is currently anticipated; (vi) risks related to the market price of GTx's common stock relative to the exchange ratio; (vii) unexpected costs, charges or expenses resulting from the transaction; (viii) potential adverse reactions or changes to business relationships resulting from the announcement or completion of the merger; (ix) the uncertainties associated with the clinical development and regulatory approval of product candidates such as cirmtuzumab and TK216, including potential delays in the commencement, enrollment and completion of clinical trials; (x) risks related to the inability of the combined company to obtain sufficient additional capital to continue to advance these product candidates and its preclinical programs, including GTx's SARD program and Oncternal's CAR-T program; (xi) uncertainties in obtaining successful clinical results for product candidates and unexpected costs that may result therefrom; (xii) risks related to the failure to realize any value from product candidates and preclinical programs being developed and anticipated to be developed in light of inherent risks and difficulties involved in successfully bringing product candidates to market; (xiii) the risk that the conditions to payment under the CVRs will be not be met and that the CVRs may otherwise never deliver any value to GTx stockholders; (xiv) risks associated with the possible failure to realize certain anticipated benefits of the merger, including with respect to future financial and operating results; and (xv) risks related to the impact of the workforce reduction reported herein on GTx's business and unanticipated charges not currently contemplated that may occur as a result of the workforce reduction, including that the workforce reduction charges, costs and expenditures may be greater than currently anticipated. Actual results and the timing of events could differ materially from those anticipated in such forward-looking statements as a result of these risks and uncertainties. Except as required by applicable law, GTx undertakes no obligation to revise or update any forward-looking statement, or to make any other forward-looking statements, whether as a result of new information, future events or otherwise.

For a discussion of the factors that may cause GTx, Oncternal or the combined organization's actual results, performance or achievements to differ materially from any future results, performance or achievements expressed or implied in such forward-looking statements, or for a discussion of risk associated with the ability of GTx and Oncternal to complete the merger and the effect of the merger on the business of GTx, Oncternal and the combined organization, see the section entitled "*Risk Factors*" beginning on page 26.

Additional factors that could cause actual results to differ materially from those expressed in the forward-looking statements are discussed in reports filed with the SEC by GTx including the risk factors included in GTx's most

recent Annual Report on Form 10-K and Current Reports on Form 8-K filed with the SEC. See the section entitled "*Where You Can Find More Information*" beginning on page 358.

If any of these risks or uncertainties materialize or any of these assumptions prove incorrect, the results of GTx, Oncternal or the combined organization could differ materially from the forward-looking statements. All forward-looking statements in this proxy statement/prospectus/information statement are current only as of the date on which the statements were made. GTx and Oncternal do not undertake any obligation to publicly update any forward-looking statement to reflect events or circumstances after the date on which any statement is made or to reflect the occurrence of unanticipated events.

THE SPECIAL MEETING OF GTX'S STOCKHOLDERS

Date, Time and Place

The GTx special meeting will be held on , 2019, at 17 W Pontotoc Ave., Suite 100, Memphis, Tennessee 38103 commencing at Central time. GTx is sending this proxy statement/prospectus/information statement to its stockholders in connection with the solicitation of proxies by the GTx Board for use at the GTx special meeting and any adjournments or postponements of the GTx special meeting. This proxy statement/prospectus/information statement is first being furnished to GTx's stockholders on or about , 2019.

Purpose of the GTx Special Meeting

The purpose of the GTx special meeting is:

1. To approve the Merger Agreement, and the transactions contemplated thereby, including the merger, the issuance of GTx's common stock to Oncternal's stockholders in accordance with the Merger Agreement and the change of control resulting from the merger.

2. To approve an amendment to the restated certificate of incorporation of GTx to effect the GTx Reverse Stock Split, in the form attached as *Annex D* to this proxy statement/prospectus/information statement.

3. To approve the amendment to the restated certificate of incorporation of GTx to effect the GTx Name Change in the form attached as *Annex E* to this proxy statement/prospectus/information statement.

4. To approve the adoption of the GTx, Inc. 2019 Incentive Award Plan in the form attached as *Annex F* to this proxy statement/prospectus/information statement.

5. To approve, on a nonbinding, advisory basis, the compensation that will be paid or may become payable to GTx's named executive officers in connection with the merger.

6. To consider and vote upon an adjournment of the GTx special meeting, if necessary, to solicit additional proxies if there are not sufficient votes in favor of Proposal Nos. 1 and 2.

7. To transact such other business as may properly come before the GTx special meeting or any adjournment or postponement thereof.

Recommendation of The GTx Board

- The GTx Board has determined that the transactions contemplated by the Merger Agreement, including the merger, the issuance of shares of GTx's common stock to Oncternal's stockholders pursuant to the Merger Agreement and the change of control resulting from the merger are fair to, advisable and in the best interest of GTx and its stockholders and has approved and declared advisable the Merger Agreement and such transactions. The GTx Board recommends that GTx's stockholders vote "FOR" Proposal No. 1 to approve the Merger Agreement and the transactions contemplated thereby, including the merger, the issuance of shares of GTx's common stock to Oncternal's stockholders and the change of control resulting from the merger.
- The GTx Board has determined that the GTx Reverse Stock Split is fair to, advisable and in the best interest of GTx and its stockholders and has approved and declared advisable the GTx Reverse Stock Split. The GTx Board recommends that GTx's stockholders vote "FOR" Proposal No. 2 to approve an amendment to the restated certificate of incorporation of GTx effecting the GTx Reverse Stock Split.

- The GTx Board has determined that the GTx Name Change is fair to, advisable and in the best interest of GTx and its stockholders and has approved and declared advisable the GTx Name Change. The GTx Board recommends that GTx's stockholders vote "FOR" Proposal No. 3 to approve an amendment to the restated certificate of incorporation of GTx effecting the GTx Name Change.
- The GTx Board has determined that the adoption of the GTx, Inc. 2019 Incentive Award Plan (the "GTx 2019 Plan") is fair to, advisable and in the best interests of GTx and its stockholders and has approved and declared advisable the GTx 2019 Plan. The GTx Board recommends that GTx's stockholders vote "FOR" Proposal No. 4 to approve the GTx 2019 Plan.
- The GTx Board has determined that the approval of the nonbinding, advisory vote on the compensation that will be paid or may become payable to GTx's named executive officers in connection with the merger is advisable and in the best interests of GTx and its stockholders and has approved such nonbinding advisory vote. The GTx Board recommends that GTx's stockholders vote "FOR" Proposal No. 5 to approve, on a nonbinding, advisory basis, the compensation that will be paid or may become payable to GTx's named executive officers in connection with the merger.
- The GTx Board has determined and believes that adjourning the GTx special meeting, if necessary, to solicit additional proxies if there are not sufficient votes in favor of Proposal Nos. 1 or 2 is advisable to, and in the best interests of, GTx and its stockholders and has approved and adopted the proposal. The GTx Board recommends that GTx's stockholders vote "FOR" Proposal No. 6 to adjourn the GTx special meeting, if necessary, to solicit additional proxies if there are not sufficient votes in favor of Proposal Nos. 1 or 2.

Record Date and Voting Power

Only holders of record of GTx's common stock at the close of business on the record date, , 2019, are entitled to notice of, and to vote at, the GTx special meeting. There were approximately holders of record of GTx's common stock at the close of business on the record date. At the close of business on the record date, shares of GTx's common stock were issued and outstanding. Each share of GTx's common stock entitles the holder thereof to one vote on each matter submitted for stockholder approval. See the section entitled "Principal Stockholders of GTx" in this proxy statement/prospectus/information statement for information regarding persons known to GTx's management to be the beneficial owners of more than 5% of the outstanding shares of GTx's common stock.

Voting and Revocation of Proxies

The proxy accompanying this proxy statement/prospectus/information statement is solicited on behalf of the GTx Board for use at the GTx special meeting.

If you are a stockholder of record of GTx as of the record date referred to above, you may vote in person at the GTx special meeting or vote by proxy using the enclosed proxy card. Whether or not you plan to attend the GTx special meeting, GTx urges you to vote by proxy to ensure your vote is counted. You may still attend the GTx special meeting and vote in person if you have already voted by proxy. As a stockholder of record you may vote in any of the following ways:

- to vote in person, attend the GTx special meeting and GTx will provide you a ballot when you arrive.
- to vote using the proxy card, simply mark, sign and date your proxy card and return it promptly in the postage-paid envelope provided. If you return your signed proxy card to GTx before the GTx special meeting, GTx will vote your shares as you direct on the proxy card.
- to vote by telephone or on the Internet, dial the number on the proxy card or voting instruction form or visit the website on the proxy card or voting instruction form to complete an electronic proxy card. You will be asked to provide GTx's number and control number from the enclosed proxy card. Your vote must be received by 11:59 p.m., Eastern time on , 2019 to be counted.

If your shares of GTx's common stock are held by your broker as your nominee, that is, in "street name," the enclosed voting instruction card is sent by the institution that holds your shares. Please follow the instructions included on that proxy card regarding how to instruct your broker to vote your shares of GTx's common stock. If you do not give instructions to your broker, your broker can vote your shares of GTx's common stock with respect to "discretionary" items but not with respect to "non-discretionary" items. Discretionary items are proposals considered routine under certain rules applicable to brokers on which your broker may vote shares held in "street name" in the absence of your voting instructions. On non-discretionary items for which you do not give your broker instructions, your shares of GTx's common stock will be treated as broker non-votes. It is anticipated that all proposals will be non-discretionary items.

All properly executed proxies that are not revoked will be voted at the GTx special meeting and at any adjournments or postponements of the GTx special meeting in accordance with the instructions contained in the proxy. If a holder of GTx's common stock executes and returns a proxy and does not specify otherwise, the shares represented by that proxy will be voted "FOR" Proposal No. 1 to approve the Merger Agreement and the transactions contemplated thereby, including the merger, the issuance of shares of GTx's common stock to Oncternal's stockholders pursuant to the Merger Agreement and the change of control resulting from the merger; "FOR" Proposal No. 2 to approve an amendment to the restated certificate of incorporation of GTx effecting the GTx Reverse Stock Split; "FOR" Proposal No. 3 to approve an amendment to the restated certificate of incorporation of GTx to effect the GTx Name Change; "FOR" Proposal No. 4 to approve the adoption of the GTx 2019 Plan; FOR" Proposal No. 5 to approve, on a nonbinding, advisory basis, the compensation that will be paid or may become payable to GTx's named executive officers in connection with the merger; and "FOR" Proposal No. 6 to approve the adjournment of the GTx special meeting, if necessary, to solicit additional proxies if there are not sufficient votes in favor of Proposal Nos. 1 or 2 in accordance with the recommendation of the GTx Board.

GTx's stockholders of record, other than those GTx's stockholders who have executed voting agreements, may change their vote at any time before their proxy is voted at the GTx special meeting in one of three ways. First, a stockholder of record of GTx can send a written notice to the Secretary of GTx stating that the stockholder would like to revoke its proxy. Second, a stockholder of record of GTx can submit new proxy instructions either on a new proxy card or by telephone or via the Internet. Third, a stockholder of record of GTx can attend the GTx special meeting and vote in person. Attendance alone will not revoke a proxy. If a stockholder of GTx of record or a stockholder who owns shares of GTx's common stock in "street name" has instructed a broker to vote its shares of GTx's common stock, the stockholder must follow directions received from its broker to change those instructions.

Required Vote

The presence, in person or represented by proxy, at the GTx special meeting of the holders of a majority of the shares of GTx's common stock outstanding and entitled to vote at the GTx special meeting is necessary to constitute a quorum at the meeting. Abstentions and broker non-votes will be counted towards a quorum. Approval of Proposal Nos. 1, 4, 5 and 6 requires the affirmative vote of the holders of a majority of the shares of GTx's common stock entitled to vote and present in person or represented by proxy at the GTx special meeting. Approval of Proposal Nos. 2 and 3 requires the affirmative vote of holders of a majority of GTx's common stock having voting power outstanding on the record date for the GTx special meeting.

Votes will be counted by the inspector of election appointed for the GTx special meeting, who will separately count "FOR" and "AGAINST" votes, abstentions, broker non-votes, and in the case of the election of directors, "WITHHOLD" votes. Abstentions will be counted towards the vote total and will have the same effect as "AGAINST" votes for Proposal Nos. 1, 2, 3, 4, 5 and 6. Broker non-votes will have the same effect as "AGAINST" votes for Proposal Nos. 2 and 3. For Proposal Nos. 1, 4, 5 and 6, broker non-votes will have no effect and will not be counted towards the vote total, but will be used to determine whether a quorum is present at the GTx special meeting.

Each of Proposal Nos. 1 and 2 are conditioned upon each other. Therefore, the merger cannot be consummated without the approval of Proposal Nos. 1 and 2. Proposal Nos. 3 and 4 are conditioned upon the consummation of the merger. If the merger is not completed or the stockholders do not approve Proposal No. 3, GTx will not change its name to "Oncternal Therapeutics, Inc." If the merger is not completed or the stockholders do not approve Proposal No. 4, the GTx 2019 Plan will not become effective. Proposal Nos. 1 and 2 are not conditioned on Proposal No. 3 or Proposal No. 4 being approved.

As of March 31, 2019 the directors and executive officers of GTx and other stockholders who signed voting agreements beneficially owned approximately 45% of the outstanding shares of GTx's common stock entitled to vote at the GTx special meeting. Pursuant to the voting agreements, each such director, executive officer and other signatory stockholder has agreed to be present (in person or by proxy) at the GTx special meeting to vote all shares of GTx's common stock owned by him, her or it as of the record date in favor of Proposals Nos. 1, 2, 3, 4 and 5. Additionally, each such stockholder has agreed, solely in his, her or its capacity as a stockholder of GTx, to vote against any competing acquisition proposal and any action, proposal or transaction that would reasonably be expected to result in a material breach of the voting agreement. As of March 31, 2019 GTx is not aware of any affiliate of Oncternal owning any shares of GTx's common stock entitled to vote at the GTx special meeting.

Solicitation of Proxies

In addition to solicitation by mail, the directors, officers, employees and agents of GTx may solicit proxies from GTx's stockholders by personal interview, telephone, telegram or otherwise. GTx and Oncternal will share equally the costs of printing and filing this proxy statement/prospectus/information statement and proxy card. Arrangements will also be made with brokerage firms and other custodians, nominees and fiduciaries who are record holders of GTx's common stock for the forwarding of solicitation materials to the beneficial owners of GTx's common stock. GTx will reimburse these brokers, custodians, nominees and fiduciaries for the reasonable out-of-pocket expenses they incur in connection with the forwarding of solicitation materials. GTx has not retained a proxy solicitor with respect to the GTx special meeting.

Other Matters

As of the date of this proxy statement/prospectus/information statement, the GTx Board does not know of any business to be presented at the GTx special meeting other than as set forth in the notice accompanying this proxy statement/prospectus/information statement. If any other matters should properly come before the GTx special meeting, it is intended that the shares represented by proxies will be voted with respect to such matters in accordance with the judgment of the persons voting the proxies.

THE MERGER

This section and the section entitled "The Merger Agreement" in this proxy statement/prospectus/information statement describe the material aspects of the merger, including the Merger Agreement. While GTx and Oncternal believe that this description covers the material terms of the merger and the Merger Agreement, it may not contain all of the information that is important to you. You should read carefully this entire proxy statement/prospectus/information statement for a more complete understanding of the merger and the Merger Agreement, including the Merger Agreement attached as Annex A, the opinion of Aquilo attached as Annex B, and the other documents to which you are referred herein. See the section entitled "Where You Can Find More Information" in this proxy statement/prospectus/information statement.

Background of the Merger

Historical Background for GTx

GTx is a biopharmaceutical company dedicated to the discovery and development of medicines to treat serious and/or significant unmet medical conditions. For the past several years, GTx has focused its development efforts on its SARM and SARD programs, two technologies licensed from UTRF.

In September 2017, GTx initiated a randomized, placebo-controlled Phase 2 clinical trial, or the ASTRID Trial, of its lead SARM product candidate enobosarm (also known as Ostarine or GTx-024) with both 3 mg and 1 mg doses to assess the safety and efficacy of the drug candidate compared to placebo.

In early August 2018, Company A reached out to GTx seeking an update on SARDs.

Following receipt of data on September 20, 2018, indicating that the ASTRID Trial had failed to achieve statistical significance on the trial's primary endpoint, a special meeting of the GTx Board was held, with GTx senior management attending. The purpose of the meeting was for GTx senior management to discuss the data with the GTx Board and to share details of the press release GTx prepared for immediate release. GTx senior management informed the GTx Board that it was halting its financing plans and would undertake a more thorough assessment of data from the clinical trial to ascertain whether there were problems with the trial that caused the unexpected results or whether the data suggests that certain subsets of patients might potentially benefit from treatment versus the universe of stress urinary incontinence ("SUI") patients included in the clinical trial. SUI is the involuntary leakage of urine during activities such as coughing, laughing, sneezing, exercising or other movements that increase intra-abdominal pressure and thus increase pressure on the bladder. In the interim, GTx senior management would assess whether it could realistically expedite the preclinical studies already underway for SARDs, and the GTx Board authorized GTx senior management to reach out to third parties who might have an interest in collaborating on SARD research and development or acquiring GTx to access the SARD technology.

On September 21, 2018, GTx announced that the ASTRID Trial failed to achieve statistical significance on the primary endpoint of the proportion of patients with a greater than 50% reduction in incontinence episodes per day compared to placebo. The percentage of patients with a greater than 50% reduction after 12 weeks of enobosarm treatment was 58.9% for 3 mg, 57.7% for 1 mg and 52.7% for placebo. Enobosarm was generally safe and well tolerated, and reported adverse events were minimal and similar across all treatment groups. After completing its review of the full data sets from the clinical trial and discussing the data with clinical experts, GTx determined that there is not a sufficient path forward to warrant additional clinical development of enobosarm to treat SUI. It has discontinued further development of enobosarm to treat SUI, including discontinuing the related durability and open-label safety extension studies which were initiated before GTx received topline data from the ASTRID Trial.

Remembering that he had received an inquiry in early August 2018 from pharmaceutical Company A seeking to get an update on SARDs, Mr. Hanover contacted the representative for Company A on September 24, 2018

suggesting that GTx senior management review with Company A GTx's current SARD data. It was noted that the parties had previously entered into a confidentiality agreement in December 2016 regarding prior SARDs discussions which was subsequently amended to address SARMs and extend the term to December 2018, and the parties agreed to assemble appropriate scientific personnel from both sides to review and discuss GTx's SARD program.

On September 25, 2018, Dr. Wills received a call from a hedge fund representative with whom he and Mr. Hanover knew from previous interactions, indicating that his fund was an investor in Company B, which might be interested in considering a merger with GTx.

On September 28, 2018, Company C contacted Dr. Wills expressing an interest in SARDs and learning more about the technology.

On October 1, 2018, Mr. Hanover was introduced by telephone to the chief executive officer of Company D, a holding company for various subsidiaries, including a subsidiary developing selective estrogen receptor degraders ("SERD") compounds. The chief executive officer of Company D expressed an interest in merging his SERD program with GTx's SARD technology and suggested that the companies enter into a mutual confidentiality agreement for the exchange of information, which was done on October 2, 2018.

On October 2, 2018, Dr. Wills received a call from two senior executives from Company E stating an interest in better understanding GTx's SARD technology, and the parties entered into a confidentiality agreement on October 3, 2018.

On October 4, 2018, GTx entered into a confidentiality agreement with Company C and the parties agreed to hold initial diligence discussions on October 10, 2018.

On October 10, 2018, GTx entered into a confidentiality agreement with Company F, which contacted Dr. Wills expressing an interest in a potential combination with GTx. Dr. Wills had a conversation and initial scientific discussion with Company F personnel on October 12, 2018 to assess their interest in moving forward with a broader discussion.

In early October 2018, Mr. Hanover inquired of pharmaceutical Company H whether it would have an interest in learning more about GTx's SARD program. A business development executive from Company H indicated Company H was interested in learning more about GTx's SARD program as well as its SARM technology, including enobosarm as a potential treatment for breast cancer. On October 10, 2018, GTx and Company H entered into a confidentiality agreement, and information about GTx and its SARD and SARM programs was sent to Company H for its review. Since SARD and SARMs comprised substantially all of the assets of GTx, Mr. Hanover told the Company H executive that it should analyze the opportunity as an acquisition of GTx.

On October 11, 2018, the chief executive officer of Company D visited GTx at GTx's headquarters, and met with GTx's senior management and GTx's largest stockholder, Mr. Hyde. The chief executive officer of Company D also met with GTx personnel and indicated his willingness to provide employment to several clinical and financial personnel should a transaction between Company D and GTx come to fruition.

Also, on October 12, 2018, GTx senior management held a teleconference with executives and scientists representing Company C to discuss more specifically GTx's SARD program.

GTx had previously sent a confidential slide deck about its SARD program to Company A on October 1, 2018, and on October 16, 2018, GTx senior management and scientists reviewed the information with various Company A personnel during a prearranged teleconference. At the end of the call, Company A stated that it would assemble its team and decide soon whether it wanted to make a business proposal to GTx. Also, the parties agreed to amend their existing confidentiality agreement to extend the term to December 2019.

On October 16, 2018, Company B notified Dr. Wills that it wanted to undertake some preclinical assays of GTx's SARD compounds to determine if the information GTx provided Company B could be reproduced by Company

B personnel and to determine if the SARD technology was sufficiently developed for Company B to make a proposal to GTx. A material transfer agreement ("MTA") was executed between the companies on October 18, 2018.

Similarly, following a discussion between Company C executives and GTx senior management, an MTA was executed with Company C on October 23, 2018 for Company C to assess GTx's SARD compounds. Under both MTAs, Company B and Company C were given a short period to conduct their assays and they were required to report their findings to GTx senior management.

On October 22, 2018, GTx senior management held a teleconference with Company F personnel to review GTx's SARD technology.

On October 14, 2018, Dr. Wills reached back out to Company G based on discussions regarding a potential collaboration for the development of SARDs between Dr. Wills and Company G from several years earlier. Dr. Wills let Company G's executives know that the SARD data it reviewed several years ago was not current and GTx had made strides in further developing the technology, which may be of interest to Company G. As a result of that conversation, the parties entered into a new confidentiality agreement on October 23, 2018, so that GTx could share current SARD data with Company G.

On October 23 and 24, 2018, Dr. Wills, Mr. Hanover and Dr. Johnston visited the headquarters of Company D to learn more about Company D's organization and corporate structure and its ongoing pharmaceutical programs, including its SERD program. Following that meeting, per the direction received from the GTx Board in September, GTx senior management decided to continue discussions with Company D and move toward Company D making a proposal for a merger with GTx.

On October 30, 2018, Company A informed Mr. Hanover and Dr. Wills that Company A had decided not to proceed with an offer at this time until GTx has been able to better understand more about how SARDs produce the outcomes seen in the various preclinical assays conducted by GTx. Company A stated that it remained interested in SARDs and would welcome additional data once the technology was better understood.

Throughout October, GTx senior management provided the GTx Board with interim updates of its ongoing conversations with potential acquirers.

During the first week of November 2018, Company D proposed that it be combined with GTx's SARD program in a combined company that would be a subsidiary of Company D. GTx and Company D discussed the possibility of a potential reverse merger between the parties, but Company D was not willing to consider a reverse merger transaction structure given its future plans for its company. Company D also proposed an equity split for the combined company stockholders that GTx senior management believed to be inadequate.

On November 1, 2018, a discussion between Company H scientists and GTx personal was held to review both programs.

Also on November 1, 2018, GTx and Company F had a follow-up discussion regarding SARDs.

On November 5, 2018, GTx senior management team and its largest stockholder and Mr. Hyde met in-person with Company D's chief executive officer and other personnel at Company D's corporate headquarters to learn more about Company D's pharmaceutical programs and its proposal for a business combination with GTx. Company D continued to propose a corporate structure for a business combination that would be difficult for a public company like GTx to accomplish and an equity split for the combined company stockholders that GTx senior management believed to be inadequate. Nevertheless, GTx senior management and Mr. Hyde stated an intention to have further discussion with the full GTx Board at the upcoming quarterly meeting on November 7, 2018.

On November 5, 2018, Company I contacted Dr. Wills inquiring about whether GTx would be interested in discussing a merger with Company I. Although Company I's pharmaceutical programs appeared to be in areas outside of any fields of expertise pertaining to SARDs or SARMs, Dr. Wills agreed that GTx senior management would entertain discussions with Company I. GTx entered into a confidentiality agreement with Company I later that day and confidential information was exchanged between the parties.

On November 6, 2018, Dr. Johnston received an inquiry from Company J about GTx's SARM program and stated an interest in exploring an acquisition of that asset. GTx and Company J entered into a confidentiality agreement on November 14, 2018, and information regarding enobosarm, including efficacy and safety data from prior clinical studies, was made available to Company J through GTx's electronic data room.

On November 7, 2018, the GTx board held its regularly scheduled quarterly meeting at the company headquarters in Memphis, Tennessee. At the meeting, Dr. Wills reported that GTx senior management had not as yet seen any clear path forward for the continued development of enobosarm to treat SUI, but it was continuing to review all data from the ASTRID Trial and discuss the data with GTx's key opinion leaders and experts. Since the announcement of data from the enobosarm study, GTx senior management had engaged with several companies expressing interest in SARDs, and a few companies potentially interested in an acquisition of GTx. He reported that GTx senior management had discussions ongoing with three private pharmaceutical companies with either preclinical and/or androgen receptor expertise which would be helpful in furthering GTx's SARD development efforts, but any merger with a private company presented difficult corporate structuring issues for a public company and the proposals that had been suggested so far would result in significant dilution for GTx's stockholders. Also, he noted that while GTx had sufficient cash to undertake SARD development on its own without the need to raise additional funds until sometime in 2020, GTx would face the risk of having all of its value resting on a single preclinical technology. The best case for GTx would be to find a merger partner with expertise that would be helpful for continued SARD development and assets of its own to spread the risk for a combined company as the development programs progress. He noted that the companies expressing interest in GTx appeared to have little or no real cash of their own or were without sufficient expertise to help with SARD development. Mr. Hanover reported that GTx senior management also had been in discussions with at least three large pharmaceutical companies interested in SARDs, and while one has recently decided not to pursue the opportunity absent receiving additional data, two companies remained interested. During this meeting, the GTx Board also discussed potentially engaging a financial advisor to assist with the process and authorized GTx senior management to begin discussions with potential financial advisors. The GTx Board agreed that it would meet again on November 19, 2018 to review GTx senior management's progress in its ongoing discussions.

On November 7, 2018, Company K contacted Mr. Hanover regarding the potential of licensing enobosarm. Mr. Hanover informed Company K that other parties were interested in acquiring enobosarm and a license of the asset was something that GTx senior management could not recommend to the GTx Board. However, should Company K be interested in making a proposal to acquire the asset, GTx senior management would be interested in receiving it.

On November 8, 2018, Company H informed Mr. Hanover that after evaluating the data for GTx's SARD and SARM program, it would not be making a proposal to acquire GTx.

On November 9, 2018, Company B called Dr. Wills and told him they had completed their assays for the SARD compounds sent to them under the MTA, and while their data was confirmatory to the data GTx previously provided them, SARDs were too early stage for them and they preferred to focus only on their own pharmaceutical programs. On November 30, 2018, Company C provided the company with a report on the assays it conducted on certain of the company's SARDs and indicated that it had decided not to pursue a merger with GTx. Under both MTAs, Company B and Company C ended their research work on SARDs and either returned excess SARD compound material to GTx or destroyed the compounds in accordance with GTx's instructions.

On November 8, 2018, Company L contacted Dr. Wills regarding the possibility of a merger transaction with GTx. After entering into a confidentiality agreement on November 16, 2018, information about both companies were exchanged between the parties.

On November 16, 2018, Company J and GTx discussed the enobosarm data.

Between November 16, 2018 and December 4, 2018, Company J and its scientific personnel continued its evaluation of enobosarm as a potential treatment for SUI.

On November 19, 2018, the GTx Board held a special meeting, with GTx senior management attending, for the purpose of receiving an update from GTx senior management of its ongoing discussions with various parties interested in discussing a transaction with GTx. Dr. Wills reported that one pharmaceutical company continued to express its interest in collaborating with GTx in the its ongoing SARD research but was not likely to be interested in discussing either a licensing of SARDs or an acquisition of GTx or its asset until such time as the preclinical research of SARDs had been completed and there was a compound identified as an IND candidate for clinical studies. Mr. Hanover reported that GTx senior management was continuing to discuss with Company D its interest in merging one of its subsidiary companies with and into GTx, but given both the continued complexity of accomplishing what Company D was suggesting and the inadequacy of its proposed equity split, Mr. Hanover believed Company D was not going to remain a viable merger prospect unless it significantly changed its proposal. Mr. Hanover reported on GTx senior management discussions with Company L and stated that it was too early in the process to know if a reasonable merger proposal could be negotiated, and GTx senior management had just started work on understanding Company L's pharmaceutical programs and cash position.

Dr. Wills reported to the GTx Board that a few other pharmaceutical companies have determined not to continue discussions with GTx senior management about a corporate transaction and Company B and Company C had decided they would not pursue a merger with GTx. Mr. Hanover noted that Dr. Johnston had received a call from Company J expressing an interest in GTx's SARM assets, including enobosarm, and he had been contacted by Company K also requesting GTx consider licensing enobosarm.

Mr. Doggrell updated the GTx Board on GTx senior management's efforts to engage a financial advisor, noting that it had been difficult to find interest from financial advisors given GTx's position unless there was a significant advisory fee. Mr. Doggrell explained to the GTx Board that it had discussed an engagement with Aquilo and had reached agreement on the terms, subject to approval by the GTx Board. Mr. Doggrell reviewed with the GTx Board an engagement letter from Aquilo, to provide financial advisory services for GTx and the GTx Board.

Between November 20, 2018 and December 11, 2018, GTx continued to engage in discussions with Company D, but the parties did not agree to revised terms.

On November 25, 2018, a GTx Board member, Dr. Carter, was contacted by David F. Hale, an Oncternal Board member, who had seen GTx's recent press releases and whom Dr. Carter knew through other board memberships. Mr. Hale indicated he would be interested in discussing a merger of Oncternal with GTx.

On November 26, 2018, Dr. Wills discussed Oncternal's business and a potential transaction with Mr. Hale and Dr. James B. Breitmeyer, Oncternal's Chief Executive Officer.

On November 30, 2018, GTx and Oncternal entered into a confidentiality agreement and the parties begin exchanging information.

Between November 2018 and early February, 2019, Dr. Wills continued to have discussions with Company G about a possible collaboration whereby Company G would undertake preclinical research and development of GTx's SARDs in collaboration with GTx and GTx's third party contractors and consultants. At the direction of

the GTx Board on November 7, 2018, Dr. Wills was exploring with Company G representatives whether it would consider making an offer to acquire either the company or its SARD assets or, alternatively, entering into a collaboration agreement to develop SARDs with an option for Company G to acquire GTx or the SARD assets should it be willing to do so when an IND had been filed and a SARD product candidate was ready to enter the clinic before committing to undertake any development efforts, Company G suggested entering into an MTA to allow it to conduct some initial experiments on GTx's existing lead SARD compounds. A draft MTA was sent to Company G at the end of January 2019, to which Company G responded, but the finalization and execution of the MTA was placed on hold by GTx senior management as it was concluding discussions with Oncternal on a letter of intent for GTx senior management to present to the GTx Board.

During this same time period, Company O made a proposal to Dr. Wills about selling or licensing enobosarm to it. As drafted, the proposal would provide for a minimal upfront payment with milestones payable only upon the occurrence of certain events subsequent to the transaction. GTx decided to delay responding to the proposal from Company O with the expectation that the combined company of Oncternal and GTx would be able to assess whether a counter offer was appropriate or some other strategic alternative for enobosarm and the company's SARM portfolio may be more appropriate.

On December 4, 2018, Company J called Mr. Hanover to communicate that it had decided not to proceed with a bid to acquire enobosarm.

On December 7, 2018, Oncternal and GTx had discussions regarding GTx's SARD technology.

On December 12, 2018, the GTx Board held a special meeting, with GTx senior management attending, for the purpose of receiving an update from Dr. Wills and Mr. Hanover on their discussions with various parties interested in some form of a potential business transaction with GTx. Mr. Hanover reported that discussions with Company D were ongoing over the last several weeks but were becoming more protracted and complex, and he was unsure whether GTx senior management would be making a favorable recommendation to the GTx Board about pursuing that transaction. Mr. Hanover explained that the complexity of trying to merge GTx's SARD technology with Company D's SERD program under the umbrella of a holding company controlled by Company D would make it difficult for GTx shareholders to have any liquidity in this investment and the equity split being suggested for GTx shareholders was inadequate. Dr. Wills reported that discussions with Company L continued to be positive but their proposed equity split for a combined company was, in his opinion, insufficient and there was little synergy in Company L's technology and what GTx would be bringing to the combined company for development. Dr. Wills reported that while discussions with Oncternal were at an early stage, he, Mr. Hanover and Mr. Hyde had good discussions with Oncternal and there seemed to be a willingness to structure a transaction that may be more beneficial to GTx and its stockholders than other companies have been willing to offer. He noted that Oncternal was an oncology company and the synergies between the two companies were good, and that Oncternal has asked for and had been given access to GTx's data room so it and its advisors could undertake more extensive due diligence of GTx and its technologies. Mr. Hanover reported that Company J had decided not to pursue the acquisition of SARMs, including enobosarm, although he had received some interest in the asset from Company K and would explore with Company K whether it was in a position to make a meaningful proposal for GTx's SARMs. He also stated that GTx senior management would be exploring with Oncternal whether it wanted GTx to retain SARMs as an asset should Oncternal and GTx decide to combine.

Mr. Shackelford reviewed with the GTx Board financial projections for 2019, assuming GTx agreed to accept one of the merger proposals then being discussed on terms which GTx senior management believed may be possible to negotiate, versus remaining independent and continuing its ongoing preclinical development of SARDs. Mr. Doggrell reported on his most recent discussions with Aquilo and reviewed with the GTx Board Aquilo's engagement letter, which the GTx Board then approved and authorized GTx senior management to sign.

In addition, the GTx Board approved and authorized GTx senior management to enter into an agreement with Aquilo which was executed on December 12, 2018.

On December 18, 2018, Dr. Wills and Mr. Hanover met in-person with Company L's executives and scientists at Company L's headquarters, and the principal executive officer thereafter informed Dr. Wills that Company L's board of directors had authorized him and his team to negotiate a non-binding merger proposal to bring back to its board for discussion. He reiterated his proposal from a telephone conversation with Dr. Wills on November 18, 2018, and stated that was the proposal his Board was willing to accept, subject to the completion of diligence by both companies.

Also on December 18, 2018, a due diligence meeting was held in San Diego, California between Dr. Wills, Mr. Hanover and members of the Oncternal management.

Thereafter, on December 19,2018, Dr. Wills telephoned Company L with a counter proposal that GTx senior management believed might be acceptable to bring to its Board for further discussion. Later in the day, this counter proposal was rejected by Company L, which added a proposal that the reverse merger be completed in a structure that would make the combined companies a subsidiary of Company L. However, the senior executive of Company L reiterated his desire to pursue the proposed reverse merger with GTx and suggested the parties meet again for a more protracted discussion about merging the two companies.

On December 19, 2018, Dr. Wills received a call from Company M expressing an interest in SARDs and suggesting a possible reverse merger with GTx. Dr. Wills explained that GTx had discussion underway with several other companies but would remain open to undertake discussions with Company M if it could move quickly through its review of GTx's assets following execution of a confidentiality agreement.

On December 21, 2018, GTx and Company M entered into a confidentiality agreement. Given the focus of Company M, a combination between it and GTx seemed an unlikely fit, but information was exchanged to determine if there was reason to accelerate these discussions.

On December 21, 2018, the GTx Board held a special meeting, with GTx senior management attending, for the purpose of receiving an update on GTx senior management's discussions with various interested parties. Representatives from each of Aquilo and GTx's outside legal counsel, Cooley LLP ("Cooley") participated in the meeting. Dr. Wills summarized ongoing discussions with both Company L and Oncternal, both of which are private companies interested in a reverse merger with GTx. He noted that Company L had proposed an unacceptable equity split for the combined company and seemed to now be suggesting that the combined company become a subsidiary of Company L, which raised additional issues about whether GTx's stockholders could hope to effectively participate in any exit strategy that Company L may have longer term. He stated that GTx senior management had countered Company L's proposal but their counter proposal was rejected. On the other hand, Dr. Wills reported that he was having good conversation with and feedback from the executive team at Oncternal and believed a transaction may be possible with Oncternal if neither Oncternal nor GTx identify any concerns during the diligence process. Dr. Wills also noted that he had just received a call from a senior executive at Company M expressing an interest in a reverse merger with GTx, and he would see if there was any reason to actively pursue that opportunity.

Mr. Hanover reported to the GTx Board that little has changed in GTx senior management's discussions with Company D throughout December, and he believed it unlikely a deal will come together that the GTx Board would support. Mr. Hanover subsequently communicated to the chief executive officer of Company D that unless he was willing to consider a proposal that would include merging his SERD technology into GTx through a reverse merger, with an equity split more favorable than he been proposing, the GTx Board was not interested in GTx senior management continuing discussions with Company D. The GTx Board indicated to GTx senior management that it should continue to pursue the opportunity with Company L or Oncternal, failing which there remained the option for GTx to remain independent and continue its preclinical development of SARDs through the calendar year 2019. Discussions with Company D about a merger of SARDs and SERDs ceased after December 2018.

In late December 2018, Mr. Hanover received a call from Company O stating that it had a potential interest in acquiring GTx's SARM, enobosarm, if its proprietary diagnostic technology indicated that certain patients in GTx's prior clinical studies would more likely benefit from enobosarm treatment for certain indications. Company O believed its technology could quickly determine if enobosarm could be used in particular ways that could enhance its effectiveness in a variety of indications. Company O expressed a desire to acquire the asset for minimal upfront costs, followed by larger milestone payments if it achieved certain criteria to be more particularly set forth in an acquisition agreement.

During the remainder of December 2018 and during the first several days of January 2019, representatives from companies Company L, Company M and Oncternal continued their respective diligence of GTx, and GTx senior management began its review of those respective companies and their assets. Meetings were scheduled between GTx senior management and executives of both Company M and Oncternal during the JP Morgan conference in San Francisco on January 8, 2019.

On December 26 and 27, 2018, Mr. Hale and Dr. Wills discussed potential terms and conditions for a reverse merger between GTx and Oncternal, including the potential for entering into a CVR Agreement, with respect to GTx's SARD and SARM technology.

On December 29, 2018, GTx entered into a confidentiality agreement with Company K and enobosarm data was made available to Company K in GTx's electronic data room throughout January.

On December 31, 2018, the GTx Board held a special meeting, with GTx senior management attending, for the purpose of receiving an update from GTx senior management regarding its ongoing discussions with potential acquirers. Dr. Wills reported that Company L was holding firm on its initial proposal for an equity split for the combined company, and it wanted the combined company to become a subsidiary of Company L. The GTx Board indicated that it had no interest in GTx senior management continuing to pursue discussions with Company L, which Dr. Wills subsequently communicated to Company L during the first week of January 2019. Similarly, Mr. Hanover reported that Company D had not altered its proposal, and he did not believe there was a realistic opportunity for GTx to continue to pursue discussions with Company D, and the GTx Board agreed. Dr. Wills noted that discussions with Oncternal continued to progress and the terms now being discussed were more favorable for GTx stockholders. The GTx Board directed GTx senior management to continue to pursue that opportunity.

Also on December 31, 2018, Dr. Wills indicated to Mr. Hale that GTx's Board held a meeting to discuss the potential merger between GTx and Oncternal, and expressed the GTx board's interest in moving forward with diligence on a potential transaction.

On January 2, 2019, GTx and Company K had a discussion regarding a potential transaction between the parties.

On January 7, 2019, Dr. Wills had a discussion with Company M regarding a potential reverse merger transaction with GTx.

On January 8, 2019, Dr. Wills, Mr. Hyde, Mr. Doggrell, Mr. Hanover and Mr. Shackelford met with representatives of Oncternal to discuss the business of Oncternal and the proposed transaction.

On January 9, 2019, GTx entered into a confidentiality agreement with Company O and Company O was provided access to GTx's data room to review enobosarm and other SARM data.

On January 9, 2019, Dr. Wills and representatives from Aquilo met with representatives of Oncternal to review the business of Oncternal.

On January 9, 2019, representatives from Aquilo met with representatives of Company M to review the business of Company M.

On January 11, 2019, the GTx Board held a special meeting, with GTx senior management attending, for the purpose of receiving an update from GTx senior management on its ongoing strategic discussions. Representatives from each of Aquilo and Cooley attended the meeting and participated in the discussions. Dr. Wills reported that he met with the senior executive representing Company M and learned that he and his team had a real interest in trying to reach an acceptable reverse Merger Agreement with GTx. He made a proposal for Dr. Wills' consideration and indicated a willingness to consider improving the proposal if his team's diligence did not signal any concerns on their part. Dr. Wills arranged for Mr. Hyde, himself and Mr. Hanover to meet with Company M's senior executive the following day. Dr. Wills continued to have concerns about whether Company M's lack of funds was one of its primary drivers of its discussion with GTx, and the dissimilarities in each company's respective technologies made Company M less appealing from a synergistic standpoint. Lastly, Dr. Wills stated that Oncternal's management team continued to be committed to reaching an agreement and they were currently negotiating a draft letter of intent to bring to the GTx Board for its review and approval.

During January, GTx determined to not pursue business combinations with Company E, Company F, or Company I given that such parties did not continue contact with GTx after initial discussions.

On January 15, 2019, GTx received an initial draft of the proposed non-binding letter of intent from Oncternal, which included a unilateral exclusivity agreement of GTx.

On January 17, 2019, Cooley sent Latham & Watkins LLP ("Latham"), outside legal counsel to Oncternal, a revised draft of the letter of intent, which among other things, included a mutual exclusivity agreement binding the parties rather than only a unilateral exclusivity agreement proposed by Oncternal.

On January 18, 2019, Latham sent Cooley a revised draft of the letter of intent.

On January 22, 2019, GTx and Company O discussed additional information regarding Company O's proposal.

On January 24, 2019, Latham sent Cooley and GTx a revised draft of the letter of intent from Oncternal.

On January 26, 2019, Cooley sent Latham and Oncternal a revised draft of the letter of intent from GTx.

On January 27, 2019, Latham sent Cooley and GTx a revised draft of the letter of intent.

On January 28, 2019, the GTx Board held a special meeting, with GTx senior management attending, for the purpose of reviewing and considering Oncternal's proposed letter of intent. Representatives from Aquilo and Cooley attended the meeting. Dr. Wills reviewed the ongoing discussions GTx senior management had had with both Oncternal and Company M and noted that discussions with Oncternal had progressed much more quickly. Although Company M had not made a made a proposal as detailed as what the GTx Board was considering from Oncternal, Dr. Wills believed the proposed equity split being offered by both companies was similar, but Oncternal was the only company then discussing the additional contingent value right for GTx shareholders as a potential value enhancement. Dr. Wills told the GTx Board that he believed that Oncternal offered a better fit as a merger counterparty for GTx, given its oncology focus and expertise, and noted that Oncternal had a preferable financial profile than Company M. Aquilo noted to the GTx Board that it had met with representatives of both companies. Dr. Wills summarized the terms of the proposed letter of intent with the GTx Board, including the equity split for Oncternal and GTx stockholders and the CVR being offered to GTx's stockholders from proceeds derived from the potential development and subsequent sale, licensing or commercialization of SARDs and SARMs by the combined company. He also told the GTx Board that he had received a proposal from Company O to license or acquire enobosarm, but Oncternal has asked that those discussions await conclusion of the proposed merger to allow Oncternal's senior management time to assess the most appropriate next steps forward for enobosarm.

The GTx Board agreed that the proposal set forth in the letter of intent was an attractive offer for GTx's stockholders and represented a fair transaction for its stockholders. The Aquilo representative stated that he saw

no reason why it would not be able to issue a fairness opinion for the proposed merger. Cooley reviewed with the GTx Board the mutual exclusivity provision in the letter of intent that would prevent either party from considering alternative transactions during the exclusivity period. The GTx Board also considered the request for mutual exclusivity included in the letter of intent and determined that it was acceptable given the process undertaken by the GTx Board in identifying a potential acquirer.

On January 28, 2019, Cooley sent Latham and Oncternal a revised draft of the letter of intent.

On January 28, 2019, Cooley corresponded with Latham regarding the revised draft of the letter of intent.

On January 29, 2019, a letter of intent with Oncternal was executed by both companies following the approval of each of the GTx Board and the Oncternal Board on the preceding day. Since there was an exclusivity provision contained in the letter of intent, there was no further conversation with Company M about its proposal following GTx's execution of the letter of intent.

On January 31, 2019, Cooley sent Latham an initial draft of the Merger Agreement, which among other things, contemplated the execution of voting agreements and lock-up agreements by stockholders of GTx and Oncternal, as contemplated by the letter of intent. Also on January 31, 2019, GTx sent Oncternal a summary of terms for a proposed CVR Agreement (the "CVR Term Sheet").

On February 1, 2019 Dr. Wills had a subsequent email exchange with a Company K's executive, which also had expressed an interest in GTx's SARMs, and told him GTx was in discussions with other parties and could not consider Company K's less attractive offer for GTx's SARMs.

On February 6, 2019, Cooley sent Latham an initial draft of the proposed lock-up agreement to be signed by certain stockholders of each of Oncternal and GTx. Also on February 6, 2019, Latham sent Cooley a revised draft of the CVR Term Sheet.

On February 7, 2019, Latham sent Cooley a revised draft of the Merger Agreement.

On February 7, Cooley sent Latham an initial draft of the proposed voting agreement to be signed by certain stockholders of each of Oncternal and GTx. Around this same time period, both companies began more in depth diligence of each other's IP, financial and corporate records and began formulating and sharing diligence information to be exhibited to a definitive Merger Agreement.

On February 8, 2019, Dr. Wills received another inquiry from Company G asking whether he or others at GTx had any additional comments on Company G's proposed MTA to further assess GTx's SARD compounds. Dr. Wills subsequently responded that GTx was still reviewing the proposed MTA and had been focusing on other matters but would be back in touch with Company G soon. It was determined in discussions with Oncternal management that following the execution and announcement of a Merger Agreement between Oncternal and GTx, Dr. Wills would be freer to explore with Company G whether an MTA would still be something both Company G and the combined companies of GTx and Oncternal wished to undertake.

Later in the evening on February 8, 2019, Cooley sent Latham an initial draft of GTx's disclosure schedules.

On February 9, 2019, Oncternal sent GTx a revised draft of the CVR Term Sheet following a discussion between the Oncternal and GTx management teams.

On February 10, 2019, Company K contacted Dr. Wills again inquiring whether he was interested in responding to the proposal of Company K to acquire enobosarm. Since it was apparent to GTx senior management that the proposal initially received from Company O was likely a superior offer, assuming Oncternal decided that is was preferable to sell or license enobosarm and the rest of the SARM technology to a third party, Dr. Wills responded that GTx was in discussions with other interested parties but it would continue to evaluate Company K's proposal and respond accordingly.

On February 13, 2019, Cooley sent Latham a revised draft of the Merger Agreement and an initial draft of the CVR Agreement.

On February 14, 2019, Latham sent Cooley revised drafts of the voting agreements.

On February 15, 2019, Latham sent Cooley a revised draft of the Merger Agreement and GTx's disclosure schedules.

On February 15, 2019, Company O inquired of Dr. Wills whether he and GTx senior management would be responding soon to its proposal to acquire enobosarm. Since GTx was subject to the exclusivity provisions of the letter of intent with Oncternal, and the proposed merger was not yet public, Dr. Wills was only able to respond that he and GTx senior management was continuing to evaluate the proposal and would be responding soon.

On February 17, 2019, Lathan sent Cooley an initial draft of Oncternal's disclosure schedules.

On February 18, 2019, GTx received a proposal from the University of Tennessee to continue the contract work by University of Tennessee scientists on SARDs after its contract expires on March 31, 2019. This proposal was transmitted to Oncternal for its evaluation and input with a recommendation that the current contract be extended in accordance with University of Tennessee's new contract proposal.

On February 18, 2019, Latham sent Cooley a revised draft of the lock-up agreement.

On February 20, 2019, Latham sent Cooley a revised draft of the CVR Agreement.

On February 20, 2019, Latham and Cooley had a discussion regarding Oncternal's disclosure schedules.

On February 20, 2019, representatives from each of Oncternal, GTx, Latham, and Cooley had a discussion regarding the approvals required from SPH USA in connection with the transaction and the potential impact on the anticipated announcement of the transaction.

On February 21, 2019, Dr. Wills responded to the proposal from Company O regarding a potential transaction between the parties for the acquisition of enobosarm. GTx and Oncternal agreed that if a transaction between Company O and GTx was agreed upon in writing before the proposed merger between GTx and Oncternal closed, then any upfront cash paid by Company O to GTx for the acquisition of enobosarm would be reflected as additional cash on GTx's balance sheet for purposes of determining whether it meets its cash target at closing of the merger, even if the transaction with Company O was closed after the closing of the merger. It was further agreed between GTx and Oncternal that any milestone payments to be paid pursuant to such agreement between GTx and Company O would be split between the combined company and GTx's stockholders in accordance with the CVR Agreement to be executed between Oncternal and GTx at closing.

On February 22, 2019, Cooley sent Latham a revised draft of GTx's disclosure schedules.

On February 26, 2019, Cooley sent Latham a revised draft of the Merger Agreement.

On February 27, 2019, Cooley sent Latham a revised draft of the CVR Agreement.

On February 28, 2019, Latham sent Cooley and GTx a revised draft of the Merger Agreement.

Late in the evening on February 28, 2019, Cooley and Latham had a discussion regarding the transaction documentation and progress towards signing and announcing the transaction. Latham also sent Cooley a revised draft of GTx's disclosure schedules later that day.

On March 1, 2019, Latham sent Cooley a further revised version of the Merger Agreement, a revised draft of the CVR Agreement, and a revised version of Oncternal's disclosure schedules. Over the following several days, Cooley and Latham held a number of meetings to finalize these drafts.

On March 2, 2019, Oncternal and GTx had a discussion regarding certain terms of the CVR Agreement. Later in the day on March 2, 2019, Cooley sent Latham and Oncternal a revised draft of the CVR Agreement.

Between March 2, 2019 and March 4, 2019, Oncternal and GTx had discussions regarding an increased termination fee that would be payable if either party is unable to deliver its required stockholder vote given that SPH USA was unable to deliver a voting agreement concurrent with signing the Merger Agreement.

On March 3, 2019, Oncternal and GTx had a discussion regarding certain terms of the CVR Agreement. Later in the day on March 3, 2019, Latham sent Cooley and GTx a revised draft of the CVR Agreement.

On March 4, 2019, Cooley had a discussion with Latham, Oncternal, and GTx regarding certain terms of the CVR Agreement.

On March 4, 2019, Mr. Hyde had discussions with Oncternal to express his concerns about whether GTx should continue pursuing a transaction for which SPH USA may not deliver a consent that was necessary to complete the transaction.

Later in the evening on March 4, 2019, Cooley sent Latham and Oncternal a revised draft of the CVR Agreement. Cooley also sent Latham and Oncternal a revised draft of the Merger Agreement, which among other things, included a termination fee of $2.0 million payable by either GTx or Oncternal under certain circumstances, including in the event that such party does not obtain its required stockholder vote within the time period specified in the Merger Agreement.

On March 5, 2019, Latham sent Cooley a revised version of GTx's disclosure schedules and Latham and Cooley exchanged multiple drafts of the CVR Agreement and Merger Agreement. Later that evening, Latham and Cooley had a discussion regarding certain issues in the Merger Agreement.

On March 6, 2019, GTx was informed by Oncternal senior management that the Oncternal Board had unanimously approved entering into the Merger Agreement with GTx, including the form of the CVR agreement attached thereto to be executed between the parties at closing.

On March 6, 2019, the GTx Board held a special meeting, with GTx senior management and representatives of each of Aquilo and Cooley attending. GTx senior management updated the GTx Board on the status of the transaction and the planned timing of the announcement of the transaction and other related communications. Aquilo then reviewed with the GTx Board its financial analysis of the transaction and rendered its oral opinion, subsequently confirmed in writing by delivery of a written opinion, dated as of March 6, 2019, to the effect that as of the date of such opinion and based upon and subject to the various assumptions made, procedures followed, matters considered and qualifications and limitations on the scope of review undertaken by Aquilo as set forth in the written opinion, the exchange ratio and CVR pursuant to the Merger Agreement was fair, from a financial point of view, to the holders of GTx common stock, as more fully described in the section entitled "The Merger—Opinion of the GTx Financial Advisor." Cooley reviewed in detail the material terms of the substantially final draft of the Merger Agreement, which had been provided to the GTx Board prior to the meeting, including the treatment of equity awards, conditions to closing, the reciprocal non-solicitation clauses subject to certain fiduciary exceptions, circumstances under which the GTx Board and Oncternal Board could change their respective recommendations, the definition of superior proposal, termination rights, the amount of termination fees and the conditions under which the termination fees become payable, the stockholder approval requirements for GTx and Oncternal and the related shares subject to voting agreements and lock-up agreements. Cooley also reviewed the certain material terms of the substantially final drafts of CVR Agreement, the voting

agreements, and the lock-up agreements, each of which had been provided to the GTx Board prior to the meeting. After discussions, the GTx Board unanimously (i) determined that the Merger Agreement and the transactions contemplated thereby, including the merger, are advisable and in the best interests of GTx and its stockholders, (ii) approved the Merger Agreement and the merger, the execution of the Merger Agreement and the consummation of the transactions contemplated thereby, (iii) declared advisable and recommended that GTx's stockholders adopt the Merger Agreement and (iv) authorized and approved certain other matters in connection with the execution and performance of the Merger Agreement, including certain regulatory filings.

Later in the day on March 6, 2019, the parties finalized, executed and delivered the Merger Agreement (including the form of the CVR Agreement), the voting agreements, and the lock-up agreements.

The following morning, on March 7, 2019, Oncternal and GTx issued a joint press release announcing the execution of the Merger Agreement. An investor conference call was held later that morning to explain the transaction and provide an overview of the oncology products the combined company would be developing and the expected timing of certain ongoing development efforts.

Historical Background for Oncternal

The Oncternal Board and management regularly review its operating and strategic plans in an effort to enhance stockholder value. These reviews involve, among other things, discussions regarding alternatives for raising the additional financing required to advance Oncternal's product development programs, including consideration of strategic alternatives that would allow the company greater access to capital markets.

During a meeting on November 25, 2018, David F. Hale, an Oncternal Board member, and GTx Board member Dr. Michael G. Carter discussed GTx's September 21, 2018, public announcement that GTx's lead product candidate had failed to achieve statistical significance on the primary endpoint of a Phase 2 clinical trial. Dr. Carter indicated that, as a result, the GTx Board was considering strategic options for the company. Mr. Hale and Dr. Carter agreed to discuss with other members of their respective boards of directors the possibility of a merger between GTx and Oncternal.

On November 26, 2018, Oncternal sent GTx a non-confidential presentation detailing Oncternal's business and product development programs and the parties discussed Oncternal's business.

On November 30, 2018, Oncternal and GTx executed a bilateral confidentiality agreement.

On December 7, 2018, Oncternal CEO Dr. James B. Breitmeyer had discussions with GTx management regarding GTx's SARD technology.

A due diligence meeting was held in San Diego, California, on December 18, 2018, between Dr. Robert J. Wills, a GTx Board member, Mr. Marc S. Hanover, CEO of GTx, Mr. Hale and Dr. Breitmeyer.

Following internal discussions with members of the Oncternal Board and legal advisors, on December 26 and 27, Mr. Hale and Dr. Wills discussed potential terms and conditions for a reverse merger between GTx and Oncternal, including the potential for entering into a CVR Agreement, with respect to GTx's SARD and SARM technology.

On December 31, 2018, Dr. Wills indicated to Mr. Hale that the GTx Board held a meeting to discuss the potential merger between GTx and Oncternal, and expressed the GTx board's interest in moving forward with diligence on a potential transaction. From this date until the execution of the definitive Merger Agreement on March 6, 2019, each of Oncternal and GTx and their respective advisors performed extensive due diligence on the other company and on the potential merger transaction.

On January 8, 2019, Mr. Hale and Dr. Breitmeyer met with members of the GTx Board and GTx management team to review Oncternal's business.

On January 9, 2019, Mr. Hale, Dr. Breitmeyer and Mr. Vincent met with representatives of Aquilo Partners, LP, GTx's investment bank, as well as a member of the GTx Board to review Oncternal's business.

On January 15, 2019, Dr. Breitmeyer submitted to representatives of GTx a letter of intent for a potential reverse merger transaction between Oncternal and GTx. From this date forward, Oncternal and GTx negotiated the terms and conditions of the merger, including exchanging numerous calls, messages and drafts of the Merger Agreement, CVR Agreement, and related documents.

On January 29, 2019, following several formal and informal discussions between representatives of Oncternal and GTx, with the support of the Oncternal Board, Oncternal and GTx executed a letter of intent containing certain limited exclusivity provisions to allow the parties to conduct further due diligence and negotiate a definitive agreement related to the merger.

On March 5, 2019, Oncternal's management team and its legal counsel reviewed with members of Oncternal's Board the terms and conditions of the merger and discussed the Board's fiduciary duties in the context of the consideration and approval of the merger. Following such discussion, the Oncternal Board approved resolutions (i) determining that the merger was in the best interests of Oncternal and its stockholders and that the terms of the merger were fair, (ii) authorizing the entry by Oncternal into the Merger Agreement and CVR Agreement and related merger documents, and (iii) approving certain other related matters.

On March 6, 2019, Dr. Breitmeyer and the chief executive officer of GTx executed the Merger Agreement, and on March 7, 2019, Oncternal and GTx issued a joint press release and held a conference call announcing the execution of the Merger Agreement.

GTx Reasons for the Merger

At a special meeting held on March 6, 2019, among other things, the GTx Board unanimously (i) determined that the merger agreement and the transactions contemplated thereby, including the merger are fair to, advisable and in the best interests of GTx and its stockholders, (ii) approved and declared advisable the merger agreement and the merger, including the issuance of shares of GTx common stock to the stockholders of Oncternal pursuant to the terms of the merger agreement, and (iii) determined to recommend, upon the terms and subject to the conditions set forth in the merger agreement, that the stockholders of GTx vote to approve the amendment of GTx's certificate of incorporation to effect the GTx Reverse Stock Split, the merger agreement, the change of control of GTx resulting from the merger pursuant to the Nasdaq Rules, and the 2019 Equity Incentive Plan.

In the course of its evaluation of the merger agreement and merger with Oncternal, the GTx Board held numerous meetings, consulted with GTx senior management, GTx's outside legal counsel and GTx's financial advisor, and reviewed and assessed a significant amount of information, and considered a number of factors, including the following:

- the GTx Board's belief that GTx's business, operational and financial prospects, including its cash position, the substantially diminished price of its common stock following the results from the ASTRID trial, the early developmental stage of its SARD technology, and the limited time frame and expertise available to GTx to potentially enhance the value of its SARD program by conducting and completing the preclinical studies needed to potentially file an IND to initiate clinical trials for a SARD compound, a go it alone scenario, was possible but not without significant risk;
- the GTx Board's belief, given the risks associated with deriving value from an early-stage preclinical technology and based in part on the judgement, advice and analysis of GTx senior management with respect to the potential strategic, financial and operational benefits of the merger (which judgement

was informed in part by the business, technical, financial and legal due diligence investigation performed by GTx with respect to Oncternal), that Oncternal's proprietary oncology-based technology platform, as well as its product pipeline, including clinical stage candidates, along with the demonstrated expertise of its management and other personnel in areas central to the development of GTx's SARDs, would create more value for GTx's stockholders in the long term than GTx may potentially create as an independent stand-alone company;

- the GTx Board's review of the current development plans of Oncternal to confirm the likelihood that the combined company would possess sufficient resources, or have access to sufficient resources, to allow Oncternal senior management to focus on its plans for the continued development of Oncternal's product pipeline, as well as the continued development of SARDs, including concluding those preclinical studies needed to identify a lead SARD compound for which an IND can be filed to initiate clinical studies;
- the GTx Board's consideration that while both GTx and Oncternal should have at the closing of the merger sufficient cash for the combined company to sustain its operations into calendar year 2020, the benefit of combining GTx's public company structure with Oncternal's business will continue to provide the combined company with access to the public market to raise additional funds in the future;
- the GTx Board's consideration of the valuation and business prospects of all the potential strategic transaction candidates, and its collective view that Oncternal was the most attractive candidate for GTx because of the synergies afforded from allying GTx's SARD program, as a potential treatment for men with castration resistant prostate cancer, with Oncternal's oncology programs to create a broader based oncology focused public company, the demonstrated expertise Oncternal can bring to the development of SARDs, and the recognition that, unlike many of the other potential strategic prospects then under consideration by GTx, Oncternal's ability to bring to the combined company its own financial resources to create a more robust company that could await potential value increasing events before having to access the public markets for additional financial resources;
- the GTx Board's conclusion that the merger provides existing GTx stockholders a significant opportunity to participate in the potential growth of the combined company following the merger, while potentially sharing in 50% of any net proceeds derived from the sale or licensing of GTx's SARD or SARM technologies or in royalties derived from the commercialization of SARD products, in both cases on account of the CVR Agreement to be executed between GTx and Oncternal at the closing of the merger;
- the GTx Board's consideration that the combined company will be led by an experienced senior management team from Oncternal and a board of directors with representation from each of the current boards of directors of GTx and Oncternal; and
- the GTx Board's consideration of the financial analysis of Aquilo and the opinion of Aquilo delivered to the GTx Board on March 6, 2019, to the effect that, as of the date of such opinion, and based upon and subject to the various assumptions made, procedures followed, matters considered and limitations and qualifications on the scope of the review undertaken by Aquilo, as set forth in its written opinion, the merger consideration to be paid by GTx to Oncternal stockholders in the merger agreement was fair to GTx, from a financial point of view, as more fully described in the section entitled "The Merger—Opinion of the GTx Financial Advisor."

The GTx Board also considered the recent results of operations and financial conditions of GTx, including:

- the perceived value of GTx reflected in the diminished price of its common stock following the failure of the ASTRID trial to demonstrate the effectiveness of enobosarm as a potential treatment for SUI, and the limited value given by the marketplace to SARDs as an early-stage preclinical asset;
- the development risks associated with using GTx's remaining cash to fund operations for at least through calendar year 2019 as GTx attempts to complete its ongoing preclinical studies and undertake

those additional preclinical studies needed to move a SARD compound to the IND stage to initiate clinical studies;

- the risk that even if GTx were to be able to file an IND to initiate Phase 1 clinical trials for a SARD compound, the value of the asset would not then be sufficiently demonstrated to either (i) attract a potential acquirer willing to pay a reasonable price for the technology or GTx or (ii) raise additional funds in the public markets to fund the continued development of SARDs at a valuation that would not lead to further substantial dilution for existing stockholders;
- the loss of certain operational capabilities of GTx, and risks associated with continuing to operate GTx on a stand-alone basis, including limiting the number of employees to only those personnel essential to running a public company and overseeing SARD preclinical development and relying on outside consultants and third-party contractors for the necessary preclinical SARD development work;
- the results of substantial efforts made over a four-month period following GTx's announcement of its disappointing results from its enobosarm ASTRID trial to solicit strategic alternatives for GTx to the merger, including the discussions that GTx senior management and Aquilo had during this period with other strategic transaction candidates;
- the current financial market conditions and historical market prices, volatility and trading information with respect to GTx common stock;
- the risks, costs and timing and limited amount, if any, that would be distributed to GTx stockholders associated with a potential liquidation of GTx if it appeared to the GTx Board, from GTx's ongoing preclinical development of SARDs, that SARDs may not be sufficiently developed to identify a likely SARD candidate for an IND filing by the end of calendar year 2019; and
- the fact that the GTx Board determined that at the end of 2019 there may be only approximately $7 million remaining for continued operations and if GTx was unable to acquire additional proceeds from a sale of equity or through a collaboration or licensing of SARDs, there would be limited funds available for distribution to stockholders if the GTx Board decided to dissolve GTx.

The GTx Board also reviewed the terms of the merger agreement, the CVR agreement and associated transactions, including:

- the fact that the exchange ratio, which is expected to give GTx stockholders approximately 25% of the combined company's outstanding stock, immediately following the merger, is financially attractive in light of GTx's standalone value, GTx's recent stock price, GTx's strategic alternatives, and the potential value of Oncternal following the merger;
- the number and nature of the conditions to Oncternal's obligations to consummate the merger, including the requirement that a significant minority shareholder of Oncternal will have to obtain the approval of the merger from its parent corporate owner, the failure of which will preclude Oncternal from completing the merger;
- the rights of, and limitation on, GTx under the merger agreement to consider certain unsolicited acquisition proposals under the certain circumstances, should GTx receive a "superior offer";
- the GTx Board's belief that the terms of the merger agreement, including the parties' representations, warranties and covenants, deal protection provisions and the conditions are reasonable for a transaction of this nature; and
- the GTx Board's belief that the CVR Agreement providing up to 50% of net proceeds to GTx stockholders of record as of the closing of the merger, whether or not they continue to hold GTx shares subsequent to the merger, is reasonable and fair under the circumstances.

The GTx Board also considered a variety of risks and other countervailing factors related to the merger, including:

- the fact that the exchange ratio may be adjusted downward if GTx's cash at the closing does not meet the applicable cash target set forth in the merger agreement;
- the up to $2 million termination fee payable by GTx to Oncternal upon the occurrence of certain events and the potential effect of such termination fee in deterring other potential acquirers from proposing an alternative transaction that may be more advantageous to GTx stockholders;
- the up to $2 million termination fee payable by Oncternal to GTx upon the occurrence of certain events, including the failure of Oncternal to obtain the approval of the merger from Oncternal's largest stockholder, SPH USA, and the likelihood the receipt of the termination fee from Oncternal will only offset a portion of expenses incurred by GTx in connection with the merger;
- the substantial expenses to be incurred by GTx in connection with the merger;
- the possible volatility of the trading price of the GTx common stock resulting from the announcement of the merger;
- the risks that the merger might not be consummated in a timely manner or at all and the potential effect of the public announcement of the merger or failure to complete the merger on the reputation of GTx;
- the risks to GTx's business, operations and financial results in the event that the merger is not consummated;
- the strategic direction of the combined company following the closing of the merger, which will be determined by a combination of individuals from Oncternal senior management and the Oncternal Board composed in the majority of members of Oncternal's existing board of directors, including their ability to determine whether there have been sufficient efforts undertaken by the combined company to develop SARDs or sell or license SARMs before deciding to discontinue such efforts; and
- various other risks associated with the combined company and the merger, including those described in the sections titled "*Risk Factors*" beginning on page 26 and "*Forward-Looking Statements*" beginning on page 114.

In addition, the GTx Board considered the interests that certain of its directors and executive officers may have with respect to the merger that are different from or in addition to their interests as stockholders of GTx, generally and specifically with respect to the fact that Mr. Hyde, a director of GTx, independently and through Pittco Associates III, L.P. and Pittco Investments, L.P., and each of its related entities, is a substantial securityholder of GTx, as more fully described under "*The Merger—Interests of GTx Directors and Executive Officers in the Merger*." The GTx Board concluded that the risks, uncertainties, restrictions and potentially negative factors associated with the merger were outweighed by the potential benefits of the merger.

The foregoing information and factors considered by the GTx Board are not intended to be exhaustive but are believed to include all of the material factors considered by the GTx Board. In view of the wide variety of factors considered in connection with its evaluation of the merger and the complexity of these matters, the GTx Board did not find it useful, and did not attempt, to quantify, rank or assign relative weights to these factors. In considering the factors described above, individual members of the GTx Board may have given weight to different factors. The GTx Board conducted an overall analysis of the factors discussed above, including thorough discussions with, and questioning of, GTx senior management and the legal and financial advisors of GTx, and considered the factors overall to be favorable to, and to support, its determination.

Oncternal Reasons for the Merger

In the course of reaching its decision to approve the merger, the Oncternal Board consulted with Oncternal's senior management, financial and tax advisors and legal counsel, reviewed a significant amount of information and considered a number of factors, including, among others:

- the potential increased access to sources of capital and a broader range of investors to support the clinical development of its product candidates following consummation of the transaction compared to if Oncternal continued to operate as a privately held company;
- the potential to provide its current stockholders with greater liquidity by owning stock in a public company;
- the board's belief that no alternatives to the merger were reasonably likely to create greater value for Oncternal's stockholders, after reviewing the various financing and other strategic options to enhance stockholder value that were considered by the Oncternal Board;
- the cash resources of the combined organization, which are expected to be approximately $26.0 million at the closing of the merger;
- the business, history and credibility of GTx and its affiliates, and its financial resources;
- the availability of appraisal rights under the DGCL to holders of Oncternal's capital stock who comply with the required procedures under the DGCL, which allow such holders to seek appraisal of the fair value of their shares of Oncternal capital stock as determined by the Delaware Court of Chancery;
- the expectation that the merger with GTx would be a more time- and cost-effective means to access capital than other options considered by the Oncternal Board, including additional private financings or an initial public offering;
- the terms and conditions of the Merger Agreement, including, without limitation, the following:
    - the determination that the expected relative percentage ownership of GTx's stockholders and Oncternal's stockholders in the combined organization was appropriate based, in the judgment of the Oncternal Board, on the board of directors' assessment of the approximate valuations of GTx (including the potential value of the SARD program and the value of the net cash GTx is expected to provide to the combined organization) and Oncternal (including the value of the net cash Oncternal is expected to provide to the combined organization);
    - the expectation that the merger will be treated as a reorganization for U.S. federal income tax purposes;
    - the limited number and nature of the conditions of the obligation of GTx to consummate the merger;
    - the rights of Oncternal under the Merger Agreement to consider certain unsolicited acquisition proposals under certain circumstances should Oncternal receive a superior proposal;
    - the conclusion of the Oncternal Board that the potential termination fee of up to $2 million, payable by GTx or Oncternal to the other party, and the circumstances when such fee may be payable, were reasonable; and
    - the belief that the other terms of the Merger Agreement, including the parties' representations, warranties and covenants, and the conditions to their respective obligations, were reasonable in light of the entire transaction;
- the shares of GTx's common stock issued to Oncternal's stockholders will be registered on a Form S-4 registration statement and will become freely tradable for Oncternal's stockholders who are not affiliates of Oncternal and who are not parties to lock-up agreements;

- the voting agreements, pursuant to which certain directors, officers and stockholders of Oncternal and GTx, respectively, have agreed, solely in their capacity as stockholders of Oncternal and GTx, respectively, to vote all of their shares of Oncternal capital stock or GTx common stock in favor of the adoption or approval, respectively, of the Merger Agreement;
- the ability to obtain a Nasdaq listing and the change of the combined organization's name to Oncternal Therapeutics, Inc. upon the closing of the merger;
- the merger may enable certain stockholders of GTx and Oncternal to increase the value of their current shareholding; and
- the likelihood that the merger will be consummated on a timely basis.

The Oncternal Board also considered a number of uncertainties and risks in its deliberations concerning the merger and the other transactions contemplated by the Merger Agreement, including the following:

- the possibility that the merger might not be completed and the potential adverse effect of the public announcement of the merger on the reputation of Oncternal and the ability of Oncternal to obtain financing in the future in the event the merger is not completed;
- the exchange ratio used to establish the number of shares of GTx's common stock to be issued to Oncternal's stockholders in the merger is fixed, except for adjustments due to the parties' cash balances at closing, and thus the relative percentage ownership of GTx's stockholders and Oncternal's stockholders in the combined organization immediately following the completion of the merger is similarly fixed;
- the termination fee of up to $2.0 million, payable by Oncternal to GTx upon the occurrence of certain events, and the potential effect of such termination fee in deterring other potential acquirers from proposing an alternative transaction that may be more advantageous to Oncternal's stockholders;
- the risk that the merger might not be consummated in a timely manner or at all;
- the expenses to be incurred in connection with the merger and related administrative challenges associated with combining the companies;
- the additional expenses and obligations to which Oncternal's business will be subject following the merger that Oncternal has not previously been subject to, and the operational changes to Oncternal's business, in each case that may result from being a public company;
- the fact that the representations and warranties in the Merger Agreement do not survive the closing of the merger and the potential risk of liabilities that may arise post-closing; and
- various other risks associated with the combined organization and the merger, including the risks described in the section entitled "Risk Factors" in this proxy statement/prospectus/information statement.

Opinion of the GTx Financial Advisor

The GTx Board requested that Aquilo evaluate the fairness, from a financial point of view, to GTx's stockholders, of the exchange ratio set forth in the Merger Agreement and the right of GTx's stockholders to receive contingent cash payments pursuant to the CVR Agreement, together, the "Consideration". On March 6, 2019, Aquilo delivered its oral opinion, subsequently confirmed in writing, to the GTx Board to the effect that, as of the date of its opinion and based upon and subject to the qualifications, limitations and assumptions set forth therein, the Consideration is fair, from a financial point of view, to GTx's stockholders.

The summary of the written opinion of Aquilo in this proxy statement is qualified in its entirety by reference to the full text of the written opinion of Aquilo, dated March 6, 2019, attached to this proxy statement as *Annex B*. You are urged to, and should, read the written opinion of Aquilo carefully and in its entirety.

The opinion of Aquilo addresses only the fairness, from a financial point of view, to GTx's stockholders of the Consideration and does not address any other aspect or implication of the merger or any other agreement, arrangement or understanding entered into in connection with the merger or otherwise. Aquilo was not requested to opine as to, and its opinion does not in any manner address, GTx's underlying business decision to proceed with or effect the merger, or any other aspect of GTx's business or any of its other assets.

In arriving at its opinion, Aquilo reviewed and analyzed, among other things:

- the Merger Agreement and the CVR Agreement;
- certain publicly available business and financial information relating to GTx and Oncternal;
- publicly available financial terms of certain sale transactions involving companies Aquilo deemed relevant and the consideration paid for such companies and comparisons of these terms with the proposed financial terms of the Merger Agreement and CVR Agreement;
- publicly available financial and business information concerning certain other companies Aquilo deemed relevant and comparisons of this financial and business information to that of GTx and Oncternal;
- certain non-public information relating to GTx that was prepared and provided to Aquilo by GTx, including certain operating and financial information relating to GTx's business, including GTx's unaudited financial statements for the year ended December 31, 2018 and financial and business forecasts and projections prepared by management of GTx relating to GTx's prospects;
- certain non-public information relating to Oncternal that was prepared and provided to Aquilo by Oncternal, including certain operating and financial information relating to Oncternal's business, including Oncternal's unaudited financial statements for the year ended December 31, 2018 and financial and business forecasts and projections prepared by management of Oncternal relating to Oncternal's prospects; and
- such other information that Aquilo considered appropriate to opine as to the fairness of the Consideration.

In addition, Aquilo discussed with management of GTx and management of Oncternal, the business, operations, financial condition and prospects of each of GTx and Oncternal, respectively, and as a combined company.

In connection with its review, Aquilo did not assume any responsibility for independent verification of any of the foregoing information and, with GTx's consent, relied on such information being complete and accurate. With respect to the financial forecasts for GTx, the management of GTx advised Aquilo, and Aquilo assumed with GTx's consent, that such forecasts were reasonably prepared on bases reflecting the best currently available estimates and judgments of GTx's management as to the future financial performance of GTx. With respect to the financial forecasts for Oncternal, the management of Oncternal advised Aquilo, and Aquilo assumed with GTx's consent, that such forecasts were reasonably prepared on bases reflecting the best currently available estimates and judgments of the management of Oncternal as to the future financial performance of Oncternal.

Aquilo relied upon, without independent verification, the assessment of each of GTx's management and Oncternal's management as to the viability of, and risks associated with, the current and future products of the combined company following the merger, including without limitation, the development, testing and marketing of such products, the receipt of all necessary governmental and other regulatory approvals for the development, testing and marketing thereof, and the life and enforceability of all relevant patents and other intellectual and

other property rights associated with such products. Aquilo assumed that combined company will not materially breach its obligations under the CVR Agreement and will use commercially reasonable efforts, as provided in the CVR Agreement, to develop one or more SARD Compounds in accordance with the development plan and monetize the SARM Technology and SARM Products following the closing of the merger, but expressed no view as to whether the SARD Compounds, SARM Technology or SARM Products will ultimately be developed or monetized. Aquilo also assumed, with GTx's consent, that, in the course of obtaining any regulatory or third-party consents, approvals or agreements in connection with the merger, no delay, limitation, restriction or condition will be imposed that would have an adverse effect on GTx, Oncternal or the combined company, or the contemplated benefits of the merger, and that the merger will be consummated in accordance with the terms of the Merger Agreement without waiver, modification or amendment of any material term, condition or agreement thereof or any waiver, modification or amendment of any material term, condition or agreement of the CVR Agreement.

In preparing its opinion, Aquilo performed a number of financial and comparative analyses. The order in which the analyses are described below does not represent the relative importance or weight given to the analyses by Aquilo. The preparation of a fairness opinion is a complex process and is not necessarily susceptible to partial analysis or summary description. Aquilo believes that its analyses must be considered as a whole and that selecting portions of its analyses and of the factors considered by it, without considering all analyses and factors, could create a misleading view of the processes underlying its opinion. No company or transaction used in the analyses performed by Aquilo as a comparison is identical to GTx or Oncternal. In addition, Aquilo may have given some analyses more or less weight than other analyses, and may have deemed various assumptions more or less probable than other assumptions, so the range of valuation resulting from any particular analysis described below should not be taken to be Aquilo's view of the actual Consideration. The analyses performed by Aquilo are not necessarily indicative of actual values or actual future results, which may be significantly more or less favorable than suggested by such analyses. In addition, analyses relating to the value of businesses or assets do not purport to be appraisals or to necessarily reflect the prices at which businesses or assets may actually be sold. The analyses performed were prepared solely as part of Aquilo's analysis of the fairness, from a financial point of view, of the Consideration to the holders of GTx common stock set forth in the Merger Agreement and CVR Agreement and do not address any other aspect or implication of the merger, including any other agreement, arrangement or understanding entered into in connection with the merger or otherwise.

At a meeting of the GTx Board held on March 6, 2019, Aquilo presented certain financial analyses in connection with the delivery of its oral opinion. Immediately thereafter, Aquilo delivered to the GTx Board its written opinion. The following is a summary of the material financial analyses performed by Aquilo in arriving at its opinion. Certain of the following summaries of financial analyses include information presented in tabular format. In order to understand fully the material financial analyses that were performed by Aquilo, the tables should be read together with the text of each summary. The tables alone do not constitute a complete description of the material financial analyses.

Exchange Ratio and Pro Forma Ownership. Based on the estimated exchange ratio, GTx's stockholders as of immediately prior to the Effective Time are expected to own approximately 25% of the outstanding common stock of GTx, and Oncternal's stockholders as of immediately prior to the Effective Time are expected to own approximately 75% of the outstanding common stock of GTx, which is subject to adjustment for each company's cash balance at closing in accordance with the Merger Agreement. The exchange ratio formula excludes Oncternal's outstanding stock options and warrants and GTx's outstanding stock options and warrants. Based on each of GTx's and Oncternal's outstanding capital stock as of March 5, 2019 and assuming no adjustment for cash levels and excluding the issuance of shares related to the exercise of any options, restricted stock awards, warrants or rights to receive such shares, and any shares of stock reserved for issuance, other than shares of GTx common stock reserved for issuance pursuant to the GTx Deferred Stock Rights, Aquilo determined that the exchange ratio would be 0.4475.

Value of GTx Shares Issued to Oncternal Stockholders. Aquilo analyzed the value of the shares to be issued to Oncternal's stockholders based on a 0.4475 exchange ratio and the most recent closing price of GTx's common

stock prior to the delivery of its opinion. Aquilo noted the value of the outstanding shares was approximately $72.4 million, that none of GTx's outstanding options or warrants were in-the-money, and the value of Oncternal's outstanding options using the treasury stock method was approximately $2.7 million and the value of Oncternal's outstanding warrants using the Black-Scholes method was approximately $1.9 million, resulting in a value of the shares of GTx's common stock to be issued to Oncternal's stockholders to be approximately $76.9 million.

Oncternal Valuation

Comparable Public Company Analysis. Aquilo reviewed, analyzed and compared Oncternal to corresponding publicly available financial information for 12 publicly-traded biotechnology companies that had a lead product candidate in oncology, and in which the lead product candidate's stage was no earlier than an ongoing Phase 1 clinical trial and no later than an ongoing Phase 2 clinical trial. The following list sets forth the comparable companies selected by Aquilo and their respective enterprise values.

Company	Enterprise Value ($ millions, rounded)
Aduro Biotech, Inc.	57.2
Affimed N.V.	103.7
Arcus Biosciences, Inc.	276.5
Calithera Biosciences, Inc.	71.3
Compugen Ltd.	156.2
Constellation Pharmaceuticals, Inc.	108.7
Forty Seven, Inc.	389.5
Marker Therapeutics, Inc.	274.7
Merus N.V.	79.2
miRagen Therapeutics, Inc.	19.6
Replimmune Group, Inc.	280.0
ZIOPHARM Oncology, Inc.	413.6

Source: SEC filings

Aquilo reviewed the enterprise values of the selected companies, which ranged from $19.6 million to $413.6 million. The result of the analysis implied a mean and median implied enterprise value for these comparable companies of $185.9 million and $132.5 million, respectively. Aquilo compared these ranges to the approximately $76.9 million in value of shares of GTx's common stock to be issued to Oncternal's stockholders.

No company used in any analysis as a comparison had a lead product candidate identical to Cirmtuzumab and they all differ in material ways. Accordingly, an analysis of the results described above is not mathematical; rather it involves complex considerations and judgments concerning differences in financial and operating characteristics of the companies and other factors that could affect the public trading value of the selected companies to which they are being compared. This analysis yielded a range of enterprise values, and therefore, such implied enterprise value ranges developed from these analyses were viewed by Aquilo collectively and not individually.

Comparable Initial Public Offering Analysis. Aquilo reviewed, analyzed and compared Oncternal to corresponding publicly available financial information for 12 initial public offerings of biotechnology companies since January 2015 that had a lead product candidate in oncology and in which the lead product candidate's stage was no earlier than an ongoing Phase 1 clinical trial and no later than an ongoing Phase 2 clinical trial. The following list sets forth the initial public offerings selected by Aquilo, including the date priced and the pre-money enterprise value.

Company	Date Priced	Pre-Money Enterprise Value ($ millions, rounded)
Arcus Biosciences, Inc.	March 14, 2018	360.8
Constellation Pharmaceuticals, Inc.	July 18, 2018	249.5
Corvus Pharmaceuticals, Inc.	March 22, 2016	240.0
Deciphera Pharmaceuticals, Inc.	September 27, 2017	378.6
Forty Seven, Inc.	June 27, 2018	321.9
Jounce Therapeutics, Inc.	January 26, 2017	177.1
Merus N.V.	May 18, 2016	65.6
Mirna Therapeutics, Inc.	October 1, 2015	39.5
Nucana plc	September 27, 2017	415.7
Replimmune Group, Inc.	July 19, 2018	338.4
TRACON Pharmaceuticals, Inc.	January 29, 2015	52.4
Zymeworks Inc.	April 27, 2017	234.3

Source: Company press releases, SEC filings, Capital IQ

Aquilo reviewed the enterprise values of the selected initial public offerings, which ranged from $39.5 million to $415.7 million. The result of the analysis implied a mean and median implied pre-money enterprise value for these comparable companies of $239.5 million and $244.8 million, respectively. Aquilo compared these ranges to the approximately $76.9 million in value of shares of GTx common stock to be issued to Oncternal's stockholders.

Although the initial public offerings were used for comparison purposes, none of these initial public offerings is directly comparable to the merger, and none of the companies in those initial public offerings is directly comparable to Oncternal, and none had a lead product candidate directly comparable to Cirmtuzumab. Accordingly, an analysis of the results of such a comparison is not purely mathematical, but instead involves complex considerations and judgments concerning differences in historical financial and operating characteristics of the companies involved and other factors that could affect the acquisition value of such companies or the company to which they are being compared.

Comparable Transaction Analysis. Aquilo reviewed, analyzed and compared Oncternal to corresponding publicly available financial information for 12 business combinations of biotechnology companies since January 2015 where the acquired company had a lead product candidate in oncology, and in which the lead product candidate's stage was no earlier than an ongoing Phase 1 clinical trial and no later than an ongoing Phase 2 clinical trial. The following list sets forth the business combinations selected by Aquilo, including the phase of the target's lead product candidate, the upfront equity consideration, any milestone consideration and total deal value.

Acquirer	Target	Date Announced	Phase of Target's Lead Product Candidate	Upfront Equity Consideration ($ millions, rounded)	Milestone Consideration ($ millions, rounded)	Total Deal Value ($ millions, rounded)
Eli Lilly and Company	AurKa Pharma Inc.	May 14, 2018	Phase 1	110.0	465.0	575.0
Merck & Co., Inc.	Viralytics Limited	February 21, 2018	Phase 2	394.0	0	394.0
Seattle Genetics, Inc.	Cascadian Therapeutics, Inc.	January 31, 2018	Phase 2	614.0	0	614.0
Merck & Co., Inc.	Rigontec GmbH	September 6, 2017	Phase 1/2	131.5	399.2	530.7
NantCell, Inc.	Altor BioScience Corporation	June 27, 2017	Phase 2	96.7	193.3	290.0
Debiopharm International S.A.	ImmunoGen, Inc.	May 23, 2017	Phase 2	25.0	30.0	55.0
Celldex Therapeutics, Inc.	Kolltan Pharmaceuticals, Inc.	November 1, 2016	Phase 1b	62.5	172.5	235.0
Bristol-Myers Squibb Company	Cormorant Pharmaceuticals AB	July 1, 2016	Phase 1/2	95.0	425.0	520.0
Roche Holding AG	Tensha Therapeutics, Inc.	January 7, 2016	Phase 1b	115.0	420.0	535.0
Agenus Inc.	PhosImmune, Inc.	December 21, 2015	Phase 1	9.9	35.0	44.9
Novartis International AG	Admune Therapeutics LLC	October 21, 2015	Phase 1	140.0	120.0	260.0
Merck & Co., Inc.	cCAM Biotherapeutics Ltd	July 27, 2015	Phase 1	95.0	510.0	605.0

Source: Company press releases, SEC filings

Aquilo reviewed the range of upfront equity considerations paid to the targets within the comparable transaction set, which ranged from $9.9 million to $614.0 million. The result of the analysis implied a mean and median upfront equity value for the comparable transactions of $157.4 million and $103.3 million, respectively.

Aquilo also considered an adjusted milestone consideration payable to the target or its stockholders within the comparable transaction set. Aquilo applied an adjustment factor, based on the phase of the target company's lead product candidate, to the total milestone consideration associated with each transaction, and added the upfront

equity value to the adjusted milestone consideration for each transaction. The total milestone consideration payable to targets with a lead product candidate in a Phase 1 clinical trial were adjusted by 5.1% and targets with a lead product candidate in a Phase 2 clinical trial were adjusted by 8.1%. The adjustment factors are the probability of success that oncology assets at these stages would achieve FDA approval, as reported by BIO in their "Clinical Development Success Rates 2006-2015" report.

The total deal values, including the upfront payment plus any adjusted milestone consideration, ranged from $11.7 million to $614.0 million. The result of this analysis implied a mean and median total adjusted deal value for the comparable transactions of $172.2 million and $131.6 million, respectively. Aquilo compared these ranges to the approximately $76.9 million in value of shares of GTx's common stock to be issued to Oncternal's stockholders.

Although the transactions were used for comparison purposes, none of these transactions is directly comparable to the merger, and none of the companies in those transactions is directly comparable to Oncternal, and none had a lead product candidate directly comparable to Cirmtuzumab. Accordingly, an analysis of the results of such a comparison is not purely mathematical, but instead involves complex considerations and judgments concerning differences in historical financial and operating characteristics of the companies involved and other factors that could affect the acquisition value of such companies or the company to which they are being compared.

Recent Oncternal Series C Private Financing Valuation. On September 22, 2018, Oncternal issued shares of its Series C preferred stock to Shanghai at an implied fully-diluted post-money valuation of $87.7 million. Aquilo noted that Shanghai also received certain rights to Oncternal products in China and certain selected other territories in connection with its purchase of Oncternal's Series C preferred stock. Aquilo compared the $87.7 million post-money valuation of Oncternal to the approximately $76.9 million in value of shares of GTx's common stock to be issued to Oncternal's stockholders.

GTx Valuation

Comparable Public Company Analysis. Aquilo reviewed, analyzed and compared GTx to corresponding publicly available financial information for 10 publicly-traded biotechnology companies in which the company's lead product candidate failed in late-stage clinical trials, across all therapeutics areas. The following list sets forth the comparable companies selected by Aquilo and their respective net cash multiples.

Company	Net Cash Multiple
Aevi Genomic Medicine, Inc.	0.7x
Aquinox Pharmaceuticals, Inc.	0.7x
Arsanis, Inc.	1.5x
Edge Therapeutics, Inc.	0.4x
Gemphire Therapeutics Inc.	1.4x
Histogenics Corporation	1.5x
Merrimack Pharmaceuticals, Inc.	1.1x
Realm Therapeutics Plc	0.6x
Vical Incorporated	0.5x
Vital Therapies, Inc.	0.5x

Source: SEC filings

Aquilo multiplied the median and mean net cash multiples, determined by the quotient of the equity market capitalization divided by the net cash of the selected companies, by GTx's estimated net cash as of December 31, 2018. The net cash multiples of these comparable public companies ranged from 0.4x to 1.5x, and the mean and median net cash multiples were 0.9x and 0.7x, respectively. The analysis implied a mean and median equity value for GTx of $25.4 million and $20.1 million, respectively.

No company used in any analysis as a comparison is identical to GTx and they all differ in material ways. Accordingly, an analysis of the results described below is not mathematical; rather it involves complex considerations and judgments concerning differences in financial and operating characteristics of the companies and other factors that could affect the public trading value of the selected companies to which they are being compared. This analysis yielded a range of enterprise values, and therefore, such implied enterprise value ranges developed from these analyses were viewed by Aquilo collectively and not individually.

Summary of Valuation Analyses

This summary of the valuation methodologies presented in this opinion refer to the Oncternal Equity Valuation Range, which is calculated from the means of the low and high valuations implied by the means and medians (as the case may be) from each of the valuation analyses described above, and set forth below:

- Comparable Public Company Analysis;
- Comparable Initial Public Offering Analysis;
- Comparable Biotechnology Transaction Analysis – Upfront Equity;
- Comparable Biotechnology Transaction Analysis – Upfront Equity plus Adjusted Milestone; and
- Recent Oncternal Series C Private Financing Valuation.

Value of GTx Shares Issued Relative to Oncternal Implied Valuation. Aquilo compared the value of GTx's common stock issued to Oncternal's stockholders based on the most recent closing price of GTx common stock prior to delivery of this opinion, and as determined by an assumed exchange ratio of 0.4475, and including:

- Oncternal's outstanding shares of capital stock;
- the number of shares of Oncternal's common stock issuable upon the exercise of options to purchase Oncternal's common stock, as calculated by the Treasury Method; and
- Value attributable to Oncternal's warrants to purchase shares of Series B-2 preferred stock of Oncternal as determined by a Black-Scholes analysis, to the Oncternal equity valuation range.

($ millions)	Low	High
Oncternal equity valuation range	$155.4	$186.3
Value of GTx common stock issued to Oncternal		$76.9

Implied Value of Outstanding GTx's Common Stock Based on Implied Value of the Combined Company. Aquilo calculated the implied value of the combined company by grossing up the Oncternal equity valuation range to 100% when assuming Oncternal contributed 75% of the value to the combined company as of the closing. Aquilo also looked separately at the implied value of the combined company based solely on Oncternal's post-money valuation following the issuance of Oncternal's Series C preferred stock.

Aquilo then calculated the implied equity valuation attributable to the holders of GTx's common stock, assuming 25% ownership in the combined company by the holders of GTx common stock as of the closing.

($ millions)	Low	High	Series C Private Financing Valuation
Oncternal equity valuation range	$155.4	$186.3	$ 87.7
Implied valuation of the combined company	$207.2	$248.4	$ 116.9
Value attributable to holders of GTx common stock based on 25% ownership:	$ 51.8	$ 62.1	$ 29.2

Aquilo then reviewed the premium of the value attributable to holders of GTx common stock in this analysis as compared to GTx's most recent equity market capitalization prior to the delivery of its opinion and the value of GTx as determined by the GTx comparable public company analysis.

($ millions)	Low	High	Series C Private Financing Valuation
Value attributable to holders of GTx common stock based on 25% ownership:	$51.8	$62.1	$ 29.2
Premium to:			
GTx market capitalization as of March 5, 2019	*115%*	*157%*	*21%*
GTx comparable public company analysis	*104%*	*145%*	*15%*

Aquilo also noted that this analysis does not ascribe any value to any consideration that may be paid to the holders of GTx common stock related to the CVR Agreement.

Miscellaneous

Aquilo's opinion and presentation to the GTx Board was one of many factors taken into consideration by the GTx Board in deciding to enter into the transactions contemplated by the Merger Agreement. Consequently, the analyses described above should not be viewed as determinative of the GTx Board's opinion, or that of GTx senior management, with respect to whether the board would have been willing to agree to different Consideration in the merger.

Pursuant to an engagement letter dated as of December 12, 2018, the GTx Board engaged Aquilo to provide financial advisory services to GTx in connection with exploring and evaluating opportunities for GTx to, among other things, combine with or be acquired by another company including, if requested, rendering its opinion to the GTx Board. Aquilo was selected by GTx based on Aquilo's qualifications, expertise and reputation. Aquilo, as part of its investment banking business, is continuously engaged in the valuation of businesses and securities in connection with mergers and acquisitions, private placements and valuations for corporate and other purposes.

Pursuant to the terms of the engagement letter and an addendum to the engagement letter dated as of December 12, 2018, GTx paid Aquilo a retainer fee of $200,000 and $400,000 upon the delivery of the opinion. GTx has also agreed to pay Aquilo an additional $900,000 upon completion of the merger. In addition, GTx has agreed to indemnify Aquilo for certain liabilities and expenses arising out of or in conjunction with its rendering of services under its engagement, including liabilities arising under the federal securities laws.

The terms of the merger were determined through arm's length negotiations between GTx and Oncternal and were approved by the GTx Board. Although Aquilo provided advice to the GTx Board during the course of these negotiations, the decision to enter into the merger was solely that of the GTx Board. Aquilo did not recommend any specific consideration to GTx or the GTx Board, or that any specific amount or type of consideration constituted the only appropriate consideration for the merger. As described above, the opinion of Aquilo and its presentation to the GTx Board were among a number of factors taken into consideration by the GTx Board in making its determination to approve the Merger Agreement and the transactions contemplated by such agreement.

Aquilo had not been engaged by GTx prior to this engagement, nor has Aquilo previously been engaged by Oncternal.

Interests of GTx Directors and Executive Officers in the Merger

In considering the recommendation of the GTx Board with respect to issuing shares of GTx's common stock as contemplated by the Merger Agreement and the other matters to be acted upon by GTx's stockholders at the GTx special meeting, GTx's stockholders should be aware that certain members of the GTx Board and certain of GTx's executive officers have interests in the merger that may be different from, or in addition to, the interests of GTx's stockholders. These interests may present them with actual or potential conflicts of interest, and these interests, to the extent material, are described below.

Each of the GTx Board and the Oncternal Board was aware of these potential conflicts of interest and considered them, among other matters, in reaching their respective decisions to approve the Merger Agreement and the merger, and to recommend, as applicable, that GTx's stockholders approve the proposals to be presented to GTx's stockholders for consideration at the GTx special meeting as contemplated by this proxy statement/prospectus/information statement, and that Oncternal's stockholders sign and return the written consent as contemplated by this proxy statement/prospectus/information statement.

Ownership Interests

As of March 31, 2019, GTx's directors and executive officers beneficially owned, in the aggregate, 30% of the shares of common stock of GTx, which for purposes of this subsection excludes any GTx shares issuable upon exercise or settlement of GTx stock options, warrants or GTx Deferred Stock Rights held by such individual. The affirmative vote of the holders of a majority of the total outstanding shares of common stock of GTx is required for approval of Proposal Nos. 2 and 3. Approval of Proposal Nos. 1 and 4 require the affirmative vote of the holders of a majority of the shares of GTx's common stock entitled to vote and present in person or represented by proxy at the GTx special meeting. Abstentions will have the same effect as votes "AGAINST" Proposal Nos. 1, 2, 3, 4, 5 and 6.

The table below sets forth information regarding the ownership of GTx's common stock as of March 31, 2019 by GTx's directors and named executive officers.

Directors and Named Executive Officers	Number of Shares of Common Stock as of March 31, 2019
Marc S. Hanover	172,049(1)
Robert J. Wills, Ph.D.	137,344(2)
Henry P. Doggrell	47,995(3)
Michael G. Carter, M.D., Ch.B., F.R.C.P.	— (4)
J. Kenneth Glass	24,226(5)
J. R. Hyde, III	6,807,338(6)
Garry A. Neil, M.D.	— (7)
Kenneth S. Robinson, M.D., M.Div.	— (8)

(1) Includes 35,287 shares held by Equity Partners XII, LLC, an entity controlled by Mr. Hanover and 12,400 shares held by trusts of which Mr. Hanover is the trustee. Excludes 22,726 shares issuable upon exercise of a warrant and 305,000 shares of common stock issuable upon the exercise of options held by Mr. Hanover

(2) Excludes 200,000 shares of common stock issuable upon the exercise of options held by Dr. Wills.

(3) Includes 934 shares held by trusts with respect to which Mr. Doggrell may be deemed to have beneficial ownership and 400 shares of common stock held by Mr. Doggrell through an individual retirement account. Also includes 664 shares held by Mr. Doggrell's wife and 2,547 shares of common stock held by Mr. Doggrell's wife through an individual retirement account. Excludes 195,999 shares of common stock issuable upon the exercise of options held by Mr. Doggrell and 11,435 shares held by a trust of which Mr. Doggrell is the co-trustee and are included in the shares reported below by J.R. Hyde, III.

(4) Excludes 46,500 shares of common stock issuable upon the exercise of options held by Dr. Carter, and 3,631 shares issuable to Dr. Carter pursuant to the GTx Directors Deferred Compensation Plan.

(5) Includes 2,450 shares of common stock held by Mr. Glass' wife through an individual retirement account. Excludes 46,500 shares of common stock issuable upon the exercise of options held by Mr. Glass, and 655 shares issuable to Mr. Glass pursuant to GTx's Directors Deferred Compensation Plan.

(6) Includes 14,535 shares held by Pittco Associates III, L.P. and 391,571 shares held by Pittco Investments, L.P., entities controlled by Mr. Hyde. Also includes 21,646 shares held by Mr. Hyde's spouse and 184,480 shares held by trusts for the benefit of Mr. Hyde's children. Excludes 2,454,483 shares issuable upon exercise of a warrant issued to Mr. Hyde in November 2014, 678,349 shares issuable upon exercise of a

warrant issued to Mr. Hyde in September 2017, and 70,276 shares issuable to Mr. Hyde pursuant to the GTx Directors Deferred Compensation Plan.

(7) Excludes 28,750 shares of common stock issuable upon the exercise of options held by Dr. Neil, and 36,759 shares issuable to Dr. Neil pursuant to the GTx Directors Deferred Compensation Plan.

(8) Excludes 46,500 shares of common stock issuable upon the exercise of options held by Dr. Robinson, and 44,105 shares issuable to Dr. Robinson pursuant to the GTx Directors Deferred Compensation Plan.

Effect of Merger on GTx Stock Awards

Under the Merger Agreement, as of immediately prior to the Effective Time, the vesting of all outstanding options to purchase shares of common stock of GTx, including those held by GTx's executive officers and directors, will accelerate in full. The number of shares of common stock of GTx underlying such options and the exercise price of such options will be adjusted appropriately to reflect the GTx Reverse Stock Split.

Based on a per share GTx stock price of $1.40, and the other assumptions set forth in footnote 2 of the table under the section entitled "- GTx Named Executive Officers Golden Parachute Payments" of this proxy statement/prospectus/information statement, none of the executive officers or directors would receive any amount, net of exercise price, if such individual exercised his or her unvested options that will vest at the time of closing and immediately sold the common stock of GTx acquired upon exercise.

The table below sets forth information regarding the GTx stock options held by each of GTx's executive officers and directors as of March 31, 2019. The number of shares of common stock of GTx underlying such options will be adjusted appropriately to reflect the GTx Reverse Stock Split.

Name	Number of Vested Company Stock Options Held	Number of Unvested Company Stock Options Held
Executive Officers		
Marc Hanover	100,001	204,999
Robert Wills	13,334	186,666
Henry Doggrell	47,667	148,332
Jason Shackelford	33,934	132,366
Non-Employee Directors		
J.R. Hyde, III	—	—
Michael G. Carter, M.D., Ch.B., F.R.C.P	27,334	19,166
J. Kenneth Glass	27,334	19,166
Garry A. Neil, M.D.	10,417	18,333
Kenneth S. Robinson, M.D., M.Div.	27,334	19,166

Director Deferred Compensation Plan

Under the Merger Agreement, as of immediately prior to the Effective Time (but in no event more than 30 days prior to the Effective Time), GTx shall take all actions necessary to cause the termination and liquidation of the GTx Deferred Stock Rights. As a result, the outstanding GTx Deferred Stock Rights will be settled at the closing in shares, to the extent shares have been credited to non-employee director stock accounts under the plan. GTx shall also ensure that any deferrals under the GTx Director Deferred Compensation Plan on or after January 3, 2019 shall be settled only in cash and that the maximum number of shares of common stock of GTx issuable upon settlement of the GTx Deferred Stock Rights shall be limited to the number of GTx Deferred Stock Rights outstanding as of the date of the Merger Agreement.

The table below sets forth information regarding the shares credited to individual non-employee director stock accounts as of March 31, 2019 under the GTx Director Deferred Compensation Plan and the value of the shares

issuable upon settlement of the corresponding GTx Deferred Stock Rights based on a per share GTx stock price of $1.40, and the other assumptions set forth in footnote 2 of the table under the section entitled "- GTx Named Executive Officers Golden Parachute Payments" of this proxy statement/prospectus/information statement. As of March 31, 2019, five of GTx's non-employee directors held Deferred Stock Rights and an aggregate of 155,426 shares of GTx common stock were issuable pursuant to the GTx Deferred Stock Rights. In addition, as of March 31, 2019, two of GTx's non-employee directors had elected to defer compensation under the GTx Director Deferred Compensation Plan after January 3, 2019, which deferrals will be paid to the non-employee directors at the closing in cash. The table below also includes, as of March 31, 2019, the aggregate deferrals under the GTx Director Deferred Compensation Plan that were accrued as of such date and will be settled in cash.

Name	Number of Shares Subject to GTx Deferred Stock Rights	Value of Shares Subject to GTx Deferred Stock Rights
J.R. Hyde, III	70,276	98,386
Michael G. Carter, M.D., Ch.B., F.R.C.P	3,631	5,083
J. Kenneth Glass	655	917
Garry A. Neil, M.D.	36,759	51,463
Kenneth S. Robinson, M.D., M.Div.	44,105	61,747

Director Positions Following the Merger

Dr. Carter and Dr. Wills are currently directors of GTx and will continue as directors of the combined organization after the Effective Time. For a description of GTx's director compensation, see "Director Compensation" below.

Director Compensation

Cash Retainers

The GTx Board has approved the GTX Non-Employee Director Compensation Policy (the "GTx Director Compensation Policy"), pursuant to which the following cash compensation payments are made quarterly to the GTx Board and committee members:

- a $35,000 annual retainer for service as a member of the GTx Board of Directors;
- a supplemental annual retainer for the Lead Director of the GTx Board and for the Chairs of each GTx Board committee in the following amounts: $15,000 for the Lead Director of the GTx Board; $17,500 for Chair of the GTx Audit Committee; $10,000 for Chair of the GTx Compensation Committee; and $8,500 for Chair of the GTx Nominating and Corporate Governance Committee; and
- a supplemental annual retainer for each member of the following committees other than the Chairs, in the following amounts: $10,000 for members of the GTx Audit Committee; $7,500 for members of the GTx Compensation Committee; $5,000 for members of the GTx Nominating & Corporate Governance Committee; and $10,000 for members of the GTx Scientific and Development Committee.

No directors currently receive consulting fees from GTx. GTx Directors who are also employees receive no additional compensation for service on the GTx Board.

Equity Compensation

Pursuant to the GTx Director Compensation Policy, each non-employee director of GTx (who does not own more than ten percent of the combined voting power of GTx's then outstanding securities) is eligible for certain initial and annual stock awards, which grants are currently made pursuant to GTx's 2013 Non-Employee Director

Equity Incentive Plan (the "GTx Directors' Plan"). Under the GTx Director Compensation Policy, any individual who first becomes a non-employee director is eligible for a stock award in such form and in such amount that the Board deems necessary to attract such individual to join the Board. In addition, under the GTx Director Compensation Policy, any individual who is serving as a non-employee director on the day following an annual meeting of GTx's stockholders automatically will be granted an option to purchase shares of common stock on that date; *provided*, *however*, that if the individual has not been serving as a non-employee director for the entire period since the preceding annual meeting, the number of shares subject to such individual's annual grant will be reduced pro rata for each full month prior to the date of grant during which such individual did not serve as a non-employee director. The shares subject to each initial grant and each annual grant vest in a series of three successive equal annual installments measured from the date of grant, so that each initial grant and each annual grant will be fully vested three years after the date of grant. The exercise price per share for the options granted under the 2013 Directors' Plan is not less than the fair market value of the stock on the date of grant.

In March 2018, the GTx Board, upon the recommendations of its Nominating and Corporate Governance Committee and the Compensation Committee, determined that the number of shares subject to the automatic annual grants occurring on the date following the 2018 annual meeting would be 7,500 shares of GTx common stock. GTx's current director compensation program will be suspended at the time of the closing of the merger and the director compensation policies for the combined organization following the merger will be re-evaluated by the compensation committee and board of directors of the combined organization following completion of the merger and may be subject to change. Non-employee directors of the combined organization are, however, expected to receive annual cash retainers and equity compensation, although the amount of such compensation has not yet been determined.

Pursuant to the Merger Agreement, all outstanding unvested options held by GTx's non-employee directors will vest in full upon the closing of the merger.

Employment Agreements

GTx has entered into employment agreements with each of its executive officers. These agreements set forth the individual's base salary, annual incentive opportunities, equity compensation and other employee benefits. All employment agreements provide for "at-will" employment, meaning that either party can terminate the employment relationship at any time, although GTx's agreements with its named executive officers provide that they would be eligible for severance benefits in certain circumstances following an involuntary or constructive termination, including an involuntary or constructive termination following a change of control. For purposes of these agreements, the merger, if consummated, will constitute a change of control transaction.

Termination Without "Cause" or for "Good Reason" after a Change of Control

The employment agreements with GTx's executive officers generally provide for cash post-termination change of control payments equal to one year's base salary and monthly premium payments to continue the executive officer's health insurance coverage for up to 12 months following his or her termination. These change of control salary continuation and health insurance coverage benefits are structured on a "double-trigger" basis, meaning that before an executive officer is eligible to receive such change of control benefits, (1) a change of control must occur and (2) within 12 months after such change of control, the named executive officer's employment must be terminated without "cause" or the named executive officer must resign for "good reason." GTx's obligation to make the salary continuation payments and health insurance premium payments under the employment agreements is conditioned upon the former named executive officer's compliance with the confidentiality provisions of the employment agreement and the provisions of the non-competition provisions of the employment agreement for a period of one year following termination. In addition, GTx's obligation to make the salary continuation payments and health insurance premium payments is conditioned upon GTx's receipt of an effective general release of claims executed by the named executive officer. The post-termination salary continuation payments will be generally made over the one-year period following termination on GTx's regular

payroll dates rather than in a lump sum, except that the timing of these payments may be deferred for up to six months if these payments would constitute deferred compensation under Section 409A of the Code (in which case, the deferred payment would be made in a lump sum following the end of the deferral period, with the balance being paid thereafter on GTx's regular payroll dates).

A change of control generally means the following:

- the sale or other disposition of all or substantially all of GTx's assets (including a liquidation or dissolution of GTx);
- if any person or group acquires beneficial ownership of 50% or more of GTx's voting securities (subject to certain exceptions);
- a merger or consolidation of GTx with or into any other entity, if immediately after the transaction more than 50% of the voting stock of the surviving entity is held by persons who were not holders of at least 50% of GTx's voting stock as of the effective date of the named executive officer's employment agreement; or
- a majority of GTx's Board becomes comprised of individuals whose nomination, appointment, or election was not approved by a majority of the Board members or their approved successors.

"*Cause*" is generally defined as the named executive officer's:

- conviction for a felony;
- theft, embezzlement, misappropriation of or intentional infliction of material damage to GTx's property or business opportunities;
- breach of his or her confidentiality or non-competition obligations, as applicable, under his or her employment agreement; or
- ongoing willful neglect of or failure to perform his or her duties, or his or her ongoing willful failure or refusal to follow any reasonable, unambiguous duly adopted written direction that is not inconsistent with the description of such named executive officer's duties, provided that such willful neglect or failure is materially damaging or materially detrimental to the business and operations of GTx, and after 30 days' notice and the opportunity to cure.

"*Good reason*" is generally defined as the following actions taken without the consent of the executive officer after a change of control (in each case where the executive officer has provided written notice within 30 days of the action, such action is not remedied by GTx within 30 days following such notice, and the executive officer's resignation is effective not later than 60 days after the expiration of such 30-day cure):

- an adverse change in the executive officer's authority, duties or responsibilities (including reporting responsibilities) which, without the executive officer's consent, represents a material reduction in or a material demotion of the named executive officer's authority, duties or responsibilities as in effect immediately prior to the change of control, or the assignment to the executive officer of any duties or responsibilities that are materially inconsistent with and materially adverse to such authority, duties or responsibilities;
- a material reduction in the then current base salary of the executive officer;
- the relocation of the executive officer's principal office to a location that increases his one-way commute by more than 20 miles (or, in the case of Dr. Wills, a relocation outside of New Jersey);
- the failure of GTx to obtain an agreement reasonably satisfactory to the executive officer from any successor entity upon the change of control to assume and agree to perform his or her employment agreement in all material respects; or

- a material breach by GTx of any provision of the executive officer's employment agreement or any other then-effective agreement with the named executive officer.

Termination Without "Cause" or For "Good Reason" Prior to or Not in Connection with a Change of Control

GTx's employment agreement with Dr. Wills provides for post-termination cash payments equal to one year's base salary (generally to be made over the one-year period following termination on GTx's regular payroll dates) and monthly premium payments to continue his health insurance coverage for up to 12 months following his termination, should his employment be terminated without "cause" or should he resign for "good reason", in each case irrespective of whether such termination is within 12 months after (or otherwise in connection with) a change of control.

Other Termination Scenarios

If GTx terminates an executive officer's employment for "cause," or if an executive officer voluntarily terminates his or her employment without "good reason," or upon the death of an executive officer, the executive officer would generally have no right to receive any compensation or benefits under his or her employment agreement on or after the effective date of termination, other than any accrued and unpaid salary and expense reimbursement. However, under GTx's employment agreement with Dr. Wills, Dr. Wills would nonetheless be entitled to any earned but unpaid annual bonus with respect to any completed calendar year immediately preceding his termination date. Likewise, except as described above under " *—Termination Without "Cause" or For "Good Reason" Prior to or Not in Connection with a Change of Control*" with respect to Dr. Wills, if GTx terminates an executive officer's employment without "cause," or if an executive officer voluntarily terminates his or her employment with "good reason," in each case not within 12 months following a change of control, the executive officer would have no right to receive any compensation or benefits under his employment agreement on or after the effective date of termination, other than any accrued and unpaid salary and expense reimbursement and, solely in the case of Dr. Wills, subject to GTx's obligation under his employment agreement to pay any accrued but unpaid annual bonus with respect to any completed calendar year immediately preceding his termination date.

Other Employment Agreement Benefits

Except as set forth above, under the employment agreements with GTx's executive officers, GTx's executive officers would not be entitled to any other benefits following termination of service, including the continuation of general employee benefits, life insurance coverage and long term disability coverage, except as otherwise required by applicable law.

Extended Post-Termination Option Exercise Period for GTx Options

As a general matter, the terms of the options GTx has granted to its executive officers and directors provided that the vested portion of these options will expire three months after the executive officer's or director's termination of service. GTx refers to the period following termination of service during which an executive officer or director can continue to exercise his or her vested stock options as the post-termination exercise period. However, in connection with the adoption of a retention bonus program by the Compensation Committee in September 2013, the options held by GTx's executive officers and outstanding on or prior to September 27, 2013 were modified to generally provide for a six month post-termination exercise period. In addition, a retention stock option granted to Mr. Doggrell in 2013 generally provides for a six month post-termination exercise period. All such post-termination exercise periods are limited by, and will not exceed, the original expiration date of the option. The terms of the retention benefit agreements with GTx's executive officers will, however, be less favorable than the terms for an extension of the post-termination exercise period provided under the terms of our equity plans. Such more favorable terms will apply under the circumstances described below.

Under GTx's 2004 Equity Incentive Plan (the "GTx 2004 Plan"), and the form of stock option agreement under GTx's 2004 Plan, the post-termination exercise period will generally be one year following termination if the termination of service is a result of an involuntary termination without cause or a constructive termination within 12 months after a change of control. Under GTx's 2013 Equity Incentive Plan (the "GTx 2013 Plan"), and the form of stock option agreement under GTx's 2013 Plan, the post-termination exercise period will generally be one year following termination if the termination of service occurs either as a condition of a change of control or upon the effectiveness of a change of control, unless the stock option is not assumed, continued or replaced by the successor or acquiring entity. If the termination is a retirement, the exercise period will be two years under each of the GTx 2004 Plan and GTx 2013 Plan. Currently, Messrs. Hanover and Doggrell are retirement-eligible.

The standard form of stock option agreement under the 2004 Plan generally defines "cause" as the grant recipient:

- committing an act that materially injures the business of GTx;
- refusing or failing to follow the lawful and reasonable directions of the Board or the appropriate individual to whom he or she reports, after 15 days' notice and the opportunity to cure;
- willfully or habitually neglecting his or her duties with GTx, after 15 days' notice and the opportunity to cure;
- being convicted of a felony that is likely to inflict or has inflicted material injury on the business of GTx; or
- committing a material fraud, misappropriation, embezzlement or other act of gross dishonesty that resulted in material loss, damage or injury to GTx.

The standard form of stock option agreement under the 2004 Plan generally defines a "constructive termination" as a voluntary termination within 12 months after a change of control after any of the following actions are taken without the consent of the grant recipient:

- the assignment to the grant recipient of any duties or responsibilities which results in a significant reduction in his or her function as in effect immediately prior to the change of control;
- a material reduction in the grant recipient's salary, as in effect on the effective date of the change of control;
- the failure to continue in effect any benefit plan or program in which the grant recipient was participating immediately prior to the effective date of the change of control, or the taking of any action that would adversely affect his or her participation in (or reduce his or her benefits under) any such benefit plan or program (but either circumstance will only be grounds for a "constructive termination" if the range of benefit plans and programs offered by the acquirer is not comparable to the benefit plans previously offered by GTx, when considered as a whole);
- a relocation of the grant recipient's principal office to a location more than 50 miles from the location at which he or she performed his or her duties as of the effective date of the change of control; or
- a material breach by GTx of any provision of the grant recipient's stock option agreement under the 2004 Plan.

GTx Named Executive Officer Golden Parachute Compensation

This section sets forth the information required by Item 402(t) of Regulation S-K regarding the compensation of each of GTx's named executive officers that is based on or otherwise relates to the merger. The consummation of the merger will constitute a change of control of GTx under the terms of the employment agreements between GTx and its named executive officers and for purposes of their equity awards. The table below describes the estimated potential payments to each of GTx's named executive officers under the terms of their employment agreements and their GTx equity awards. The benefits shown reflect only the additional payments or benefits that

the individual would have received upon the occurrence of a change in control or an involuntary termination within 12 months following a change of control. The amounts shown do not include the value of payments or benefits that would have been earned absent the closing of the change of control or such a qualifying termination.

Please note the amounts shown in the table are estimates only and are based on assumptions regarding events that may or may not actually occur, including assumptions described in this proxy statement/prospectus/information statement and in the notes to the table below, which may or may not actually occur or may occur at times different than the time assumed. Some of these assumptions are based on information currently available and, as a result, the actual amounts, if any, that may become payable to a named executive officer may materially differ from the amounts set forth below. Furthermore, for purposes of calculating these amounts, GTx has assumed:

- the Effective Time occurred on March 31, 2019;
- a price per share of GTx common stock of $1.40, which represents the average closing trading price of GTx common stock over the first five business days following the first public announcement of the transaction;
- the employment of each of Messrs. Hannover and Doggrell and Dr. Wills will be terminated on such date in a manner that entitles the named executive officer to receive the severance payments and benefits under the terms of the employment agreements between GTx and such named executive officer (as described in above under the heading “Employment Agreements”). The employment of each of named executive officer is expected to be terminated effective as of the closing of the merger;
- the named executive officers’ base salaries are those in place as of March 31, 2019; and
- no named executive officer enters into new agreements or is otherwise legally entitled to, prior to the Effective Time, additional compensation or benefits.

Name	Cash(1)	Option Acceleration and Extension(2)	Benefits(3)	Total(4)
Marc S. Hanover	$445,628	$ —	$ 28,281	$473,909
Robert J. Wills, Ph.D.	$226,600	$ —	$ —	$226,600
Henry P. Doggrell	$389,463	$ —	$ 40,266	$429,729

(1) With respect to Messrs. Hanover and Doggrell and Dr. Wills, under the employment agreements, cash severance would be payable following termination of the named executive officer’s employment by GTx other than for cause (and other than due to death or disability) or the named executive officer’s resignation for good reason, in either case, within 12 months following a change of control, subject to the named executive officer’s execution of a release of claims. In either such event, pursuant to the employment agreements, the named executive officer will receive (1) severance payments equal to one year’s base salary and (2) 12 months’ continued health coverage at company expense. Any amounts payable in connection with the termination of an executive’s employment are subject to applicable withholdings and are payable over the one-year period following the effective date of the named executive officer’s release, except that the timing of these payments may be deferred for up to six months if these payments would constitute deferred compensation under Section 409A of the Code (in which case, the deferred payment would be made in a lump sum following the end of the deferral period, with the balance being paid thereafter on GTx’s regular payroll dates). These severance benefits are double-trigger benefits in that they will be paid only if the named executive officer experiences a qualifying termination of employment during the period described above, in accordance with the employment agreements.

(2) With respect to the named executive officers, under the Merger Agreement, effective as of immediately prior to the Effective Time, each GTx stock option will fully vest. The accelerated vesting is a single-trigger (closing of the merger) benefit that will be received solely because of the merger and regardless of whether a named executive officer’s employment is terminated. As noted above in the section entitled, “Extended Post-Termination Option Exercise Period for GTx Options,” an extended exercise period will be provided upon certain qualifying terminations of employment.

Based on a per share GTx stock price of $1.40, and the other assumptions set forth above, none of the executive officers or directors would receive any amount, net of exercise price, if such individual exercised his or her unvested options that will vest at the time of closing and immediately sold the common stock of GTx acquired upon exercise. As a result, there are no amounts reported in this column.

Name	Number of Unvested GTx Stock Options Subject to Acceleration
Marc S. Hanover	204,999
Robert J. Wills, Ph.D.	186,666
Henry P. Doggrell	148,332

(3) Consists of COBRA coverage for a period of 12 months following the date of termination. The value is based upon the type of insurance coverage GTx carried for each named executive officer as of March 31, 2019 and is valued at the premiums in effect on such date. These benefits are double-trigger benefits in that they will be paid only if the executive officer experiences a qualifying termination of employment following the Effective Time in accordance with the employment agreements and does not otherwise receive other healthcare coverage from a new employer prior to the end of the 12 month period.

(4) The severance benefits prescribed by the employment agreements are subject to a Section 280G better-off cutback provision, which provides that, in the event that the benefits provided to the named executive officer pursuant to the employment agreements or otherwise constitute parachute payments with the meaning of Section 280G of the Code, the severance benefits will either be delivered in full or reduced to the extent necessary to avoid an excise tax under Section 4999 of the Code, whichever would result in the named executive officer receiving the largest amount of severance benefits on an after-tax basis. The amounts reported in this table do not reflect any such reductions as a result of the limit under Section 280G of the Code.

Interests of Oncternal Directors and Executive Officers in the Merger

In considering the recommendation of the Oncternal Board with respect to adopting the Merger Agreement, Oncternal's stockholders should be aware that certain members of the Oncternal Board and certain executive officers of Oncternal may have interests in the merger that may be different from, or in addition to, the interests of Oncternal's stockholders. Each of the GTx Board and the Oncternal Board was aware of these potential conflicts of interest and considered them, among other matters, in reaching their respective decisions to approve the Merger Agreement and the merger, and to recommend, as applicable, that GTx's stockholders approve the proposals to be presented to GTx's stockholders for consideration at the GTx special meeting as contemplated by this proxy statement/prospectus/information statement, and that Oncternal's stockholders sign and return the written consent as contemplated by this proxy statement/prospectus/information statement.

Ownership Interests

Certain of Oncternal's directors and executive officers or entities affiliated with them currently hold shares of Oncternal's capital stock, which such shares of capital stock will be converted into shares of GTx's common stock at the Effective Time. The table below sets forth the ownership of Oncternal's capital stock as of March 31, 2019 by Oncternal's directors and executive officers and their anticipated ownership of Oncternal common stock immediately prior to the closing of the merger.

Directors and Named Executive Officers	Number of Shares of Capital Stock as of March 31, 2019	Number of Shares of Capital Stock Immediately Prior to the Closing of the Merger
Executive Officers		
James B. Breitmeyer, M.D., Ph.D.(1)	3,786,433	3,786,433
Richard G. Vincent(2)	692,574	692,574
Hazel M. Aker(3)	126,719	126,719
Non-Employee Directors		
David F. Hale(4)	9,780,554	9,780,554
Cooper Collins(5)	16,888,889	16,888,889
Cam Gallagher(6)	3,545,159	3,545,159
Scott Glenn(7)	8,028,793	8,028,793
Yanjun Liu, M.D., Ph.D.	—	—
Xin Nakanishi, Ph.D.	—	—
William R. LaRue(8)	356,677	356,677
Charles P. Theuer, M.D., Ph.D.	200,000	200,000

(1) Consists of (i) 3,482,856 shares of common stock held directly by Dr. Breitmeyer, (ii) 293,577 shares of common stock held by a family trust (the "Breitmeyer Trust") and (iii) 10,000 shares of common stock held by Dr. Breitmeyer as custodian for his child. Dr. Breitmeyer and Ms. Breitmeyer are the trustees of the Breitmeyer Trust, and in such capacity have joint power to vote and dispose of the shares held by the Breitmeyer Trust.

(2) Consists of (i) 555,897 shares of common stock held directly by Mr. Vincent, including 315,512 shares subject to repurchase by Oncternal and (ii) 136,677 shares of common stock held by a family trust (the "Vincent Trust"). Mr. Vincent and his wife, Stacy Vincent, are the trustees of the Vincent Trust, and in such capacity have joint power to vote and dispose of the shares held by the Vincent Trust.

(3) Consists of (i) 58,381 shares of common stock held directly by Ms. Aker and (ii) 68,338 shares of common stock held by a family trust (the "Aker Trust"). Ms. Aker and her husband, Larry Aker, are the trustees of the Aker Trust, and in such capacity have joint power to vote and dispose of the shares held by the Aker Trust.

(4) Consists of (i) 9,530,554 shares of common stock held by Hale BioPharma Ventures, LLC and (ii) 250,000 shares of common stock held by Hale Trading Company. Mr. Hale is the Chairman and Chief Executive Officer of Hale BioPharma Ventures and the Managing Director of Hale Trading Company, and as such has voting and investment control over the shares held by Hale BioPharma Ventures and Hale Trading Company.

(5) Consists of (i) 9,455,556 shares of common stock held by MagnaSci Fund, L.P., (ii) 2,444,445 shares of common stock held by MagnaSci Fund II, L.P. and (iii) 4,988,888 shares of common stock held by MagnaSci Co-Investments, L.L.C. MagnaSci GP, L.L.C. is the sole general partner of MagnaSci Fund and MagnaSci Fund II. Cooper Collins is a Manager of MagnaSci GP and MagnaSci Co-Investments, and has voting and investment power over the shares held by MagnaSci Fund, MagnaSci Fund II and MagnaSci Co-Investments.

(6) Consists of (i) 3,345,159 shares of common stock, including 263,021 shares subject to repurchase by Oncternal, held directly by Mr. Gallagher and (ii) 200,000 shares of common stock held by Mr. Gallagher as custodian for his child.

(7) Consists of 8,028,793 shares of common stock held by Glenn Holdings, L.P. Mr. Glenn is the General Partner of Glenn Holdings, and as such has voting and investment control over the shares held by Glenn Holdings.

(8) Consists of (i) 220,000 shares of common stock held directly by Mr. LaRue, including 151,250 shares subject to repurchase by Oncternal, and (ii) 136,677 shares of common stock held by a family trust (the "LaRue Trust"). Mr. LaRue and his wife, Joyce LaRue, are the trustees of the LaRue Trust, and in such capacity have joint power to vote and dispose of the shares held by the LaRue Trust.

Treatment of Oncternal Options and Warrants

Under the Merger Agreement, at the Effective Time, each outstanding and unexercised option or warrant to purchase shares of Oncternal's capital stock as of immediately prior to the Effective Time, whether or not vested, shall be converted into and become an option or warrant, as applicable, to purchase shares of GTx's common stock, in accordance with the terms and conditions of such Oncternal option or warrant, as applicable, immediately prior to the Effective Time. Certain of Oncternal's directors and executive officers currently hold options, subject to vesting, to purchase shares of Oncternal's common stock. The table below sets forth certain information with respect to such options.

Option holder Name	Grant Date	Expiration Date	Exercise Price ($)	Number of Shares of Common Stock Underlying Option as of March 31, 2019	Number of Vested Shares of Common Stock Underlying Option as of March 31, 2019
James B. Breitmeyer	9/1/2015	8/31/2025	0.05	1,600,000	1,300,000
	11/14/2018	11/14/2028	0.06	2,300,000	—
Richard G. Vincent	11/14/2018	11/14/2028	0.06	1,000,000	—

Management Prior to and Following the Merger

As described elsewhere in this proxy statement/prospectus/information statement, including in the section captioned "*Management Prior to and Following the Merger*," certain of Oncternal's directors and executive officers are expected to become the directors and executive officers of GTx upon the closing of the merger.

Indemnification and Insurance

Under the Merger Agreement, from the Effective Time through the sixth anniversary of the date on which the Effective Time occurs, GTx and Oncternal, as the surviving corporation in the merger, shall indemnify and hold harmless each person who is or has served as a director or officer of Oncternal against all claims, losses, liabilities, damages, judgments, fines and reasonable fees, costs and expenses, including attorneys' fees and disbursements, incurred in connection with any claim, action, suit, proceeding or investigation, whether civil, criminal, administrative or investigative, arising out of or pertaining to the fact that such person is or was a director or officer of Oncternal, to the fullest extent permitted under the DGCL for directors or officers of Delaware corporations. In addition, each such director and officer, or former director and officer, is entitled to advancement of expenses incurred in the defense of any such claim, action, suit, proceeding or investigation.

Under the Merger Agreement, the provisions of GTx's restated certificate of incorporation and amended and restated bylaws with respect to indemnification, advancement of expenses and exculpation of present and former directors and officers of GTx shall not be amended, modified or repealed for a period of six years from the Effective Time in a manner that would adversely affect the rights thereunder of individuals who, at or prior to the Effective Time, were officers or directors of GTx. The certificate of incorporation and bylaws of Oncternal, as the surviving corporation in the merger, shall contain provisions no less favorable with respect to indemnification, advancement of expenses and exculpation of former and present directors and officers that are presently set forth in the certificate of incorporation and bylaws of GTx.

The Merger Agreement also provides that GTx shall maintain directors' and officers' liability insurance policies commencing at the closing time of the merger, on commercially available terms and conditions with coverage limits customary for U.S. public companies similar situated to GTx.

Limitations of Liability and Indemnification

In addition to the indemnification obligations required by the restated certificate of incorporation and amended and restated bylaws of GTx, GTx has entered into indemnification agreements with each of its directors and officers. These agreements provide for the indemnification of GTx's directors and executive officers for all reasonable expenses and liabilities incurred in connection with any action or proceeding brought against them by reason of the fact that they are or were agents of GTx. GTx believes that these restated certificate of incorporation provisions, amended and restated bylaw provisions and indemnification agreements are necessary to attract and retain qualified persons as directors and officers.

Oncternal Stock Options and Warrants

As of March 31, 2019, an aggregate of 6,868,251 shares of Oncternal common stock were issuable upon the exercise of outstanding stock options under the Oncternal Therapeutics 2015 Equity Incentive Plan at a weighted-average exercise price of $0.06 per share. At the Effective Time, each Oncternal option that is outstanding and unexercised immediately prior to the Effective Time under the Oncternal Therapeutics 2015 Equity Incentive Plan, whether or not vested, will be converted into and become an option to purchase shares of GTx's common stock, and GTx will assume the Oncternal Therapeutics 2015 Equity Incentive Plan and each such Oncternal option in accordance with the terms of the Oncternal Therapeutics 2015 Equity Incentive Plan and the terms of the stock option agreement by which such Oncternal option is evidenced.

As of March 31, 2019, an aggregate of 5,064,712 shares of Oncternal's preferred stock were issuable upon the exercise of outstanding warrants at an exercise price of $0.45 per share. At the Effective Time, each Oncternal warrant that is outstanding and unexercised will become a warrant to purchase shares of GTx's common stock and GTx will assume each Oncternal warrant in accordance with its terms.

Form of the Merger

The Merger Agreement provides that at the Effective Time, Merger Sub will be merged with and into Oncternal. Upon the consummation of the merger, Oncternal will continue as the surviving corporation and will be a wholly-owned subsidiary of GTx.

After completion of the merger, assuming Proposal No. 3 is approved by GTx's stockholders at the GTx special meeting, GTx will be renamed "Oncternal Therapeutics, Inc." and expects to trade on Nasdaq under the symbol "ONCT."

Merger Consideration

At the Effective Time:

- each share of Oncternal common stock outstanding immediately prior to the Effective Time will automatically be converted into the right to receive a number of shares of GTx's common stock equal to the exchange ratio, subject to adjustment to account for the GTx Reverse Stock Split (prior to the Effective Time, each share of Oncternal preferred stock will be converted into one share of Oncternal common stock);
- each option to purchase shares of Oncternal's common stock outstanding and unexercised immediately prior to the Effective Time will be assumed by GTx and will become an option, subject to vesting, to purchase shares of GTx's common stock with the number of shares of GTx's common stock underlying such options and the exercise prices for such options adjusted to reflect the exchange ratio and the GTx Reverse Stock Split; and

- each warrant to purchase shares of Oncternal's capital stock outstanding and not terminated or exercised as of immediately prior to the Effective Time will be assumed by GTx and will become a warrant to purchase shares of GTx's common stock with the number of shares of GTx's common stock underlying such warrants and the exercise prices for such warrants adjusted to reflect the exchange ratio and the GTx Reverse Stock Split.

Immediately after the merger, based on the estimated exchange ratio, it is expected that Oncternal's existing stockholders will own approximately 75% of the outstanding capital stock of GTx with GTx's existing stockholders owning approximately 25% of the outstanding capital stock of GTx. The ownership percentage to be held by GTx's stockholders is subject to adjustment prior to closing of the merger, including a downward adjustment to the extent that GTx's "Parent Cash Amount" (as defined in the Merger Agreement) at the Effective Time is less than the threshold provided in the Merger Agreement, which adjusts based on the date of closing (and as a result, GTx stockholders could own less, and Oncternal stockholders could own more, of the combined organization), an upward adjustment to the extent that GTx's Parent Cash Amount at the Effective Time is greater than the threshold provided in the Merger Agreement, which adjusts based on the date of closing (and as a result, GTx stockholders could own more, and Oncternal stockholders could own less, of the combined organization), or an upward adjustment to the extent that Oncternal's "Company Cash Amount" (as defined in the Merger Agreement) at the Effective Time is less than $10,500,000 (and as a result, GTx stockholders could own more, and Oncternal stockholders could own less, of the combined organization). The exchange ratio formula excludes Oncternal's outstanding stock options and warrants and GTx's outstanding stock options and warrants.

The Merger Agreement does not include a price-based termination right, and there will be no adjustment to the total number of shares of GTx's common stock that Oncternal's stockholders will be entitled to receive for changes in the market price of GTx's common stock. Accordingly, the market value of the shares of GTx's common stock issued pursuant to the merger will depend on the market value of the shares of GTx's common stock at the time the merger closes, and could vary significantly from the market value on the date of this proxy statement/prospectus/information statement.

No fractional shares of GTx's common stock will be issuable to Oncternal's stockholders pursuant to the merger. Instead, each stockholder of Oncternal who would otherwise be entitled to receive a fraction of a share of GTx's common stock, after aggregating all fractional shares of GTx's common stock issuable to such stockholder, will be entitled to receive in cash the dollar amount, rounded to the nearest whole cent, without interest, determined by multiplying such fraction by the volume weighted-average closing trading price of a share of GTx's common stock on Nasdaq for the five consecutive trading days ending five trading days immediately prior to the date upon which the merger becomes effective.

The Merger Agreement provides that, at the Effective Time, GTx will deposit with an exchange agent acceptable to GTx and Oncternal certificates or evidence of book-entry shares representing the shares of GTx's common stock issuable to Oncternal's stockholders and a sufficient amount of cash to make payments in lieu of fractional shares.

The Merger Agreement provides that, promptly after the Effective Time, the exchange agent will mail to each record holder of Oncternal capital stock immediately prior to the Effective Time a letter of transmittal and instructions for surrendering and exchanging Oncternal stock certificates held by such record holder in exchange for certificates or book-entry shares of GTx's common stock. Upon surrender of an Oncternal stock certificate for exchange to the exchange agent, together with a duly signed letter of transmittal and such other documents as the exchange agent or GTx may reasonably require, the Oncternal stock certificate surrendered will be cancelled and the holder of such Oncternal stock certificate will be entitled to receive the following:

- a certificate or certificates or book-entry shares representing the number of whole shares of GTx's common stock that such holder has the right to receive pursuant to the provisions of the Merger Agreement, and
- cash in lieu of any fractional share of GTx's common stock.

From and after the Effective Time, until it is surrendered, each certificate that previously evidenced shares of Oncternal common stock or shares of Oncternal's preferred stock will be deemed to represent only the right to receive shares of GTx's common stock, and cash in lieu of any fractional share of GTx's common stock.

If any Oncternal stock certificate has been lost, stolen or destroyed, GTx may, in its discretion, and as a condition precedent to the delivery of any book-entry shares of GTx's common stock, require the owner of such lost, stolen or destroyed certificate to provide an affidavit claiming such certificate has been lost, stolen or destroyed and that includes an obligation of such owner to indemnify GTx against any claim suffered by GTx related to the lost, stolen or destroyed Oncternal stock certificate as GTx may reasonably request.

GTx will not pay dividends or other distributions on any shares of GTx's common stock to be issued in exchange for shares of Oncternal's capital stock represented by any unsurrendered Oncternal stock certificate until such Oncternal stock certificate is surrendered as provided in the Merger Agreement.

Effective Time of the Merger

The Merger Agreement requires the parties to consummate the merger as promptly as practicable (and in any event within two business days) after all of the conditions to the consummation of the merger contained in the Merger Agreement are satisfied or waived. The merger will become effective upon the filing of a certificate of merger with the Secretary of State of the State of Delaware or at such later time as is agreed by GTx and Oncternal and specified in the certificate of merger. Neither GTx nor Oncternal can predict the exact timing of the consummation of the merger.

Regulatory Approvals

In the United States, GTx must comply with applicable federal and state securities laws and the rules and regulations of the Nasdaq Capital Market in connection with the issuance of shares of GTx's common stock and the filing of this proxy statement/prospectus/information statement with the SEC.

Tax Treatment of the Merger

GTx and Oncternal intend the merger to qualify as a "reorganization" within the meaning of Section 368(a) of the Code. GTx and Oncternal have agreed to use their reasonable best efforts to cause the merger to qualify as a reorganization under Section 368(a) of the Code, and to not take any actions that are reasonably expected to cause the merger to fail to so qualify. For a description of certain of the considerations regarding U.S. federal tax consequences of the merger, see the section entitled "*The Merger—Material U.S. Federal Income Tax Consequences of the Merger*" below.

Material U.S. Federal Income Tax Consequences of the Merger

The following discussion is a summary of the material U.S. federal income tax consequences of the merger to U.S. Holders (as defined below) who exchange their Oncternal common stock for GTx common stock in the merger, but does not purport to be a complete analysis of all potential tax effects. The effects of other U.S. federal tax laws, such as estate and gift tax laws, and any applicable state, local or non-U.S. tax laws are not discussed. This discussion is based on the Code, Treasury Regulations promulgated thereunder, judicial decisions, and published rulings and administrative pronouncements of the IRS, in each case in effect as of the date hereof. These authorities may change or be subject to differing interpretations. Any such change or differing interpretation may be applied retroactively in a manner that could adversely affect a U.S. Holder. Neither GTx nor Oncternal has sought or intend to seek any rulings from the IRS regarding the matters discussed below. There can be no assurance the IRS or a court will not take a position regarding the tax consequences of the merger contrary to that discussed below. This discussion assumes that the merger will be consummated in accordance with the Merger Agreement and as described in this proxy statement/prospectus/information statement.

This discussion is limited to U.S. Holders that hold Oncternal common stock as a "capital asset" within the meaning of Section 1221 of the Code (generally, property held for investment). This discussion does not address all U.S. federal income tax consequences relevant to a U.S. Holder's particular circumstances, including the impact of the alternative minimum tax or the Medicare contribution tax on net investment income. In addition, it does not address consequences relevant to U.S. Holders subject to special rules, including, without limitation:

- U.S. expatriates and former citizens or long-term residents of the United States;
- U.S. Holders whose functional currency is not the U.S. dollar;
- persons holding Oncternal common stock as part of a hedge, straddle or other risk reduction strategy or as part of a conversion transaction or other integrated investment;
- banks, insurance companies, and other financial institutions;
- real estate investment trusts or regulated investment companies;
- brokers, dealers or traders in securities;
- "controlled foreign corporations," "passive foreign investment companies," and corporations that accumulate earnings to avoid U.S. federal income tax;
- S corporations, partnerships or other entities or arrangements treated as partnerships for U.S. federal income tax purposes (and investors therein);
- persons for whom Oncternal common stock constitutes "qualified small business stock" within the meaning of Section 1202 of the Code;
- tax-exempt organizations or governmental organizations;
- persons subject to special tax accounting rules as a result of any item of gross income with respect to Oncternal common stock being taken into account in an "applicable financial statement" (as defined in the Code);
- persons deemed to sell Oncternal common stock under the constructive sale provisions of the Code;
- persons who hold or received Oncternal common stock pursuant to the exercise of any employee stock option or otherwise as compensation; and
- tax-qualified retirement plans.

If an entity treated as a partnership for U.S. federal income tax purposes holds Oncternal common stock, the tax treatment of a partner in the partnership will depend on the status of the partner, the activities of the partnership and certain determinations made at the partner level. Accordingly, partnerships holding Oncternal common stock and the partners in such partnerships should consult their tax advisors regarding the U.S. federal income tax consequences to them.

THIS DISCUSSION IS FOR INFORMATION PURPOSES ONLY AND IS NOT TAX ADVICE. HOLDERS SHOULD CONSULT THEIR TAX ADVISORS WITH RESPECT TO THE APPLICATION OF THE U.S. FEDERAL INCOME TAX LAWS TO THEIR PARTICULAR SITUATIONS AS WELL AS ANY TAX CONSEQUENCES OF THE MERGER ARISING UNDER THE U.S. FEDERAL ESTATE OR GIFT TAX LAWS OR UNDER THE LAWS OF ANY STATE, LOCAL OR NON-U.S. TAXING JURISDICTION OR UNDER ANY APPLICABLE INCOME TAX TREATY.

For purposes of this discussion, a U.S. Holder is a beneficial owner of Oncternal common stock that, for U.S. federal income tax purposes, is or is treated as:

- an individual who is a citizen or resident of the United States;
- a corporation created or organized under the laws of the United States, any state thereof, or the District of Columbia;

- an estate, the income of which is subject to U.S. federal income tax regardless of its source; or
- a trust that (i) is subject to the primary supervision of a U.S. court and the control of one or more "United States persons" (within the meaning of Section 7701(a)(30) of the Code) over all of its substantial decisions or (ii) has a valid election in effect to be treated as a United States person for U.S. federal income tax purposes.

U.S. Federal Income Tax Consequences of the Merger to U.S. Holders of Oncternal Common Stock

It is a condition to GTx's obligation to consummate the merger that GTx receive an opinion from Cooley LLP, dated as of the closing date, to the effect that the merger will qualify as a "reorganization" within the meaning of Section 368(a) of the Code. It is a condition to Oncternal's obligation to consummate the merger that Oncternal receive an opinion from Latham & Watkins LLP, dated as of the closing date, to the effect that the merger will qualify as a "reorganization" within the meaning of Section 368(a) of the Code. Subject to the representations, assumptions and exclusions in such tax opinions, in the opinions of Cooley LLP and Latham & Watkins LLP, the merger will qualify as a "reorganization" within the meaning of Section 368(a) of the Code.

These opinions will be based on customary assumptions and representations from GTx and Oncternal, as well as certain warranties, covenants and undertakings by GTx, Oncternal and Merger Sub (collectively, the "tax opinion representations and assumptions"). If any of the tax opinion representations and assumptions is incorrect, incomplete or inaccurate, or is violated, the validity of the opinions described above may be affected and the tax consequences of the merger could differ from those described in this proxy statement/prospectus/information statement.

An opinion of counsel represents counsel's best legal judgment but is not binding on the IRS or any court, and there can be no certainty that the IRS will not challenge the conclusions reflected in the opinions or that a court would not sustain such a challenge. Neither GTx nor Oncternal intends to obtain a ruling from the IRS with respect to the tax consequences of the merger. If the IRS were to successfully challenge the "reorganization" status of the merger, the tax consequences would differ materially from those described in this proxy statement/prospectus/information statement.

Accordingly, on the basis of the opinions described above:

- a U.S. Holder of shares of Oncternal common stock generally will not recognize any gain or loss upon the exchange of shares of Oncternal common stock for shares of GTx common stock in the merger, except with respect to cash received in lieu of fractional shares (as discussed below);
- a U.S. Holder of shares of Oncternal common stock will have a tax basis in the shares of GTx common stock received in the merger (including fractional shares deemed received and redeemed as described below) equal to the tax basis of the shares of Oncternal common stock surrendered in exchange therefor;
- a U.S. Holder of shares of Oncternal common stock will have a holding period for the shares of GTx common stock received in the merger (including fractional shares deemed received and redeemed as described below) that includes its holding period for its shares of Oncternal common stock surrendered in exchange therefor; and
- if a U.S. Holder of shares of Oncternal common stock acquired different blocks of shares of Oncternal common stock at different times or at different prices, the shares of GTx common stock received in the merger (including fractional shares deemed received and redeemed as described below) will be allocated pro rata to each block of shares of Oncternal common stock, and the basis and holding period of such shares of GTx common stock will be determined on a block-for-block approach depending on the basis and holding period of each block of shares of Oncternal common stock exchanged for such shares of GTx common stock.

Cash in Lieu of Fractional Shares

A U.S. Holder that receives cash in lieu of a fractional share of GTx common stock generally will be treated as having received such fractional share and then as having received such cash in redemption of the fractional share. Gain or loss generally will be recognized based on the difference between the amount of cash received in lieu of the fractional share of GTx common stock and the portion of the U.S. Holder's aggregate adjusted tax basis in the shares of Oncternal common stock surrendered which is allocable to the fractional share of GTx common stock deemed received. Such gain or loss generally will be long-term capital gain or loss if the U.S. Holder's holding period for its shares of Oncternal common stock exceeds one year at the Effective Time.

Tax Consequences if the Merger Fails to Qualify as a Reorganization

If the merger does not qualify as a "reorganization" within the meaning of Section 368(a) of the Code, a U.S. Holder of Oncternal common stock generally would recognize gain or loss for U.S. federal income tax purposes on each share of Oncternal common stock surrendered in the merger in an amount equal to the difference between the fair market value, at the time of the merger, of the GTx common stock received in the merger (including any cash received in lieu of a fractional share) and such U.S. Holder's tax basis in the Oncternal common stock surrendered in the merger. Gain or loss must be calculated separately for each block of Oncternal common stock exchanged by such U.S. Holder if such blocks were acquired at different times or for different prices. Any gain or loss recognized generally would be capital gain or loss, and generally would be long-term capital gain or loss if the U.S. Holder's holding period in a particular block of Oncternal common stock exceeds one year at the effective time of the merger. Long-term capital gain of non-corporate U.S. Holders (including individuals) generally is taxed at reduced U.S. federal income tax rates. The deductibility of capital losses is subject to limitations. A U.S. Holder's tax basis in shares of GTx common stock received in the merger would be equal to the fair market value thereof as of the effective time of the merger, and such U.S. Holder's holding period in such shares would begin on the day following the merger.

Information Reporting and Backup Withholding

If the merger qualifies as a "reorganization" under Section 368(a) of the Code, current Treasury Regulations require certain U.S. Holders who are "significant holders" of Oncternal common stock (generally, a U.S. Holder that owns at least 1% of the outstanding Oncternal common stock or has a basis in Oncternal non-stock securities of at least $1,000,000 immediately before the merger) to comply with certain reporting requirements. Significant holders generally will be required to file a statement with their U.S. federal income tax returns for the taxable year in which the merger occurs setting forth certain information with respect to the transaction. U.S. Holders should consult their tax advisors to determine whether they are significant holders required to provide the foregoing statement. In addition, a U.S. Holder may be subject to information reporting and backup withholding when such holder receives cash in lieu of fractional shares of GTx common stock in the merger. Certain U.S. Holders are exempt from backup withholding, including corporations and certain tax-exempt organizations. A U.S. Holder will be subject to backup withholding if such holder is not otherwise exempt and:

- the holder fails to furnish the holder's taxpayer identification number, which for an individual is ordinarily his or her social security number;
- the holder furnishes an incorrect taxpayer identification number;
- the applicable withholding agent is notified by the IRS that the holder previously failed to properly report payments of interest or dividends; or
- the holder fails to certify under penalties of perjury that the holder has furnished a correct taxpayer identification number and that the IRS has not notified the holder that the holder is subject to backup withholding.

Backup withholding is not an additional tax. Any amounts withheld under the backup withholding rules may be allowed as a refund or a credit against a U.S. Holder's U.S. federal income tax liability, provided the required

information is timely furnished to the IRS. U.S. Holders should consult their tax advisors regarding their qualification for an exemption from backup withholding and the procedures for obtaining such an exemption.

Nasdaq Stock Market Listing

GTx's common stock currently is listed on Nasdaq under the symbol "GTXI." GTx has agreed to use commercially reasonable efforts to maintain its existing listing on Nasdaq, to obtain approval for listing on Nasdaq of the shares of GTx's common stock that Oncternal's stockholders will be entitled to receive pursuant to the merger and to obtain approval to have the combined company's common stock listed on Nasdaq. In addition, under the Merger Agreement, each party's obligation to complete the merger is subject to the satisfaction or waiver by each of the parties, at or prior to the merger, of various conditions, including that the existing shares of GTx's common stock must have been continually listed on Nasdaq, and GTx must have caused the shares of GTx's common stock to be issued in the merger to be approved for listing on Nasdaq as of the closing of the merger.

Prior to consummation of the merger, GTx intends to file an initial listing application with Nasdaq pursuant to Nasdaq "reverse merger" rules. If such application is accepted, GTx anticipates that the shares of GTx's common stock will be listed on Nasdaq following the closing of the merger under the trading symbol "ONCT."

Anticipated Accounting Treatment

The merger will be recorded by GTx as a reverse asset acquisition in accordance with U.S. generally accepted accounting principles ("U.S. GAAP"). For accounting purposes, Oncternal is considered to be acquiring GTx in this transaction. The transaction is expected to be accounted for as a reverse asset acquisition as the fair value of the acquired preclinical assets is deemed to be substantially concentrated in a group of similar assets that do not meet the definition of a business under existing U.S. GAAP, which are subject to change and interpretation. Under the reverse asset acquisition method of accounting, management of GTx and Oncternal have made a preliminary estimated purchase price calculated as described in Note 2 to the Notes to the Unaudited Pro Forma Condensed Combined Financial Information. The net tangible and intangible assets acquired and liabilities assumed in connection with the transaction are at their estimated acquisition date fair values. The reverse asset acquisition method of accounting is dependent upon certain valuations and other studies that have yet to commence or progress to a stage where there is sufficient information for a definitive measurement. A final determination of these estimated fair values, which cannot be made prior to the completion of the transaction, will be based on the actual net tangible and intangible assets of GTx that exist as of the date of completion of the transaction.

Appraisal Rights

Delaware Law

If the merger is completed, Oncternal's stockholders who do not deliver a written consent approving the merger are entitled to appraisal rights under Section 262 of the DGCL ("Section 262"), *provided* that they comply with the conditions established by Section 262. Holders of GTx common stock are not entitled to dissenter's rights under Delaware law or other appraisal rights in connection with the merger.

The discussion below is not a complete summary regarding the appraisal rights of Oncternal's stockholders under Delaware law and is qualified in its entirety by reference to the text of the relevant provisions of Delaware law, which are attached to this proxy statement/prospectus/information statement as *Annex C*. Stockholders intending to exercise appraisal rights should carefully review *Annex C* of this proxy statement/prospectus/information statement. Failure to follow precisely any of the statutory procedures set forth in *Annex C* of this proxy statement/prospectus/information statement may result in a termination or waiver of these rights. This summary does not constitute legal or other advice, nor does it constitute a recommendation that Oncternal's stockholders exercise their appraisal rights under Delaware law.

Under Section 262, where a merger is adopted by stockholders by written consent in lieu of a meeting of stockholders pursuant to Section 228 of the DGCL, either the constituent corporation, before the effective date of the merger, or the surviving corporation, within 10 days after the effective date of the merger, must notify each stockholder of the constituent corporation entitled to appraisal rights, if any, of the approval of the merger, the effective date of the merger and that appraisal rights are available.

If the merger is completed, within 10 days after the effective date of the merger Oncternal will notify its stockholders that the merger has been approved, the effective date of the merger and that appraisal rights are available to any stockholder who has not approved the merger, if any. Holders of shares of Oncternal capital stock who desire to exercise their appraisal rights must deliver a written demand for appraisal to Oncternal within 20 days after the date of mailing of that notice, and the stockholder must not have delivered a written consent approving the merger. A demand for appraisal must reasonably inform Oncternal of the identity of the stockholder and that such stockholder intends thereby to demand appraisal of the shares of Oncternal capital stock held by such stockholder. Failure to deliver a written consent approving the merger will not in and of itself constitute a written demand for appraisal satisfying the requirements of Section 262. All demands for appraisal should be addressed to Oncternal Therapeutics, Inc., 11750 Sorrento Valley Road, Suite 250, San Diego, CA 92121, Attention: General Counsel, and should be executed by, or on behalf of, the record holder of shares of Oncternal capital stock. ALL DEMANDS MUST BE RECEIVED BY ONCTERNAL WITHIN TWENTY (20) DAYS AFTER THE DATE ONCTERNAL MAILS A NOTICE TO ITS STOCKHOLDERS NOTIFYING THEM THAT THE MERGER HAS BEEN APPROVED, THE EFFECTIVE DATE OF THE MERGER AND THAT APPRAISAL RIGHTS ARE AVAILABLE TO ANY STOCKHOLDER WHO HAS NOT APPROVED THE MERGER, IF ANY.

If a holder of shares of Oncternal's capital stock fails to deliver a written demand for appraisal within the time period specified above, such holder will be entitled to receive the merger consideration for such holder's shares of Oncternal capital stock as provided for in the Merger Agreement, but will have no appraisal rights with respect to his, her or its shares of Oncternal's capital stock.

To be effective, a demand for appraisal by a holder of shares of Oncternal's capital stock must be made by, or in the name of, the registered stockholder, fully and correctly, as the stockholder's name appears on the stockholder's stock certificate(s). Beneficial owners who do not also hold the shares of record may not directly make appraisal demands to Oncternal. The beneficial owner must, in these cases, have the registered owner, such as a broker, bank or other custodian, submit the required demand in respect of those shares. If shares are owned of record in a fiduciary capacity, such as by a trustee, guardian or custodian, execution of a demand for appraisal should be made by or for the fiduciary; and if the shares are owned of record by more than one person, as in a joint tenancy or tenancy in common, the demand should be executed by or for all joint owners. An authorized agent, including an authorized agent for two or more joint owners, may execute the demand for appraisal for a stockholder of record; however, the agent must identify the record owner or owners and expressly disclose the fact that, in executing the demand, he or she is acting as agent for the record owner. A record owner, such as a broker, who holds shares as a custodian for others, may exercise the record owner's right of appraisal with respect to the shares held for one or more beneficial owners, while not exercising this right for other beneficial owners. In that case, the written demand should state the number of shares as to which appraisal is sought. Where no number of shares is expressly mentioned, the demand will be presumed to cover all shares held in the name of the record owner. In addition, the stockholder must continuously hold the shares of record from the date of making the demand through the Effective Time.

If a holder of shares of Oncternal's capital stock holds shares of Oncternal's capital stock in a brokerage account or in other custodian form and such holder wishes to exercise appraisal rights, such holder should consult with such holder's bank, broker or other custodian to determine the appropriate procedures for the making of a demand for appraisal by the custodian.

At any time within 60 days after the Effective Time, any stockholder who has demanded an appraisal, but has neither commenced an appraisal proceeding or joined an appraisal proceeding as a named party, has the right to

withdraw such stockholder's demand and accept the terms of the merger by delivering a written withdrawal to Oncternal. If, following a demand for appraisal, a holder of shares of Oncternal's capital stock who has demanded an appraisal has withdrawn such holder's demand for appraisal in accordance with Section 262, such holder will have the right to receive the merger consideration for such holder's shares of Oncternal capital stock.

Within 120 days after the Effective Time, any stockholder who has delivered a demand for appraisal in accordance with Section 262 will, upon written request to the surviving corporation, be entitled to receive a written statement setting forth the aggregate number of shares not voted in favor of the Merger Agreement and with respect to which demands for appraisal rights have been received and the aggregate number of holders of such shares. This written statement will be mailed to the requesting stockholder within ten days after the stockholder's written request is received by the surviving corporation or within ten days after expiration of the period for delivery of demands for appraisal, whichever is later. Within 120 days after the Effective Time, either the surviving corporation or any stockholder who has delivered a demand for appraisal in accordance with Section 262 may file a petition in the Delaware Court of Chancery demanding a determination of the fair value of the shares held by all such stockholders. Upon the filing of the petition by a stockholder, service of a copy of the petition must be made upon the surviving corporation. The surviving corporation has no obligation to file a petition in the Delaware Court of Chancery in the event there are dissenting stockholders, and Oncternal, which is expected to be the surviving corporation, has no present intent to file a petition in the Delaware Court of Chancery. Accordingly, the failure of a stockholder to file a petition within the period specified could nullify the stockholder's previously written demand for appraisal.

If a petition for appraisal is duly filed by a stockholder and a copy of the petition is delivered to the surviving corporation, the surviving corporation will then be obligated, within 20 days after receiving service of a copy of the petition, to provide the Delaware Court of Chancery with a duly verified list containing the names and addresses of all stockholders who have demanded an appraisal of their shares and with whom agreements as to the value of their shares have not been reached by the surviving corporation. After notice to dissenting stockholders who demanded appraisal of their shares, if any, the Delaware Court of Chancery is empowered to conduct a hearing upon the petition, and to determine those stockholders who have complied with Section 262 and who have become entitled to the appraisal rights provided thereby. The Delaware Court of Chancery may require the stockholders who have demanded appraisal for their shares to submit their stock certificates to the Register in Chancery for notation thereon of the pendency of the appraisal proceedings; and if any stockholder fails to comply with that direction, the Delaware Court of Chancery may dismiss the proceedings as to that stockholder. If immediately before the merger the shares of the class or series of stock as to which appraisal rights are available were listed on a national securities exchange, the Delaware Court of Chancery will dismiss the proceedings as to all holders of such shares who are otherwise entitled to appraisal rights unless (1) the total number of shares entitled to appraisal exceeds 1% of the outstanding shares of the class or series eligible for appraisal, (2) the value of the consideration provided in the merger for such total number of shares exceeds $1.0 million or (3) the merger was approved pursuant to Sections 253 or 267 of the DGCL.

After determination of the stockholders entitled to appraisal of their shares, the Delaware Court of Chancery will appraise the "fair value" of the shares owned by those stockholders. This value will be exclusive of any element of value arising from the accomplishment or expectation of the merger, but may include a fair rate of interest, if any, upon the amount determined to be the fair value. At any time before the entry of judgment in the proceedings, the surviving corporation may pay to each shareowner entitled to appraisal an amount in cash, in which case interest shall accrue thereafter only upon the sum of (1) the difference, if any, between the amount paid and the fair value of the shares as determined by the Delaware Court of Chancery, and (2) interest theretofore accrued, unless paid at that time. When the value is determined, the Delaware Court of Chancery will direct the payment of the value, with interest thereon accrued during the pendency of the proceeding, if the Delaware Court of Chancery so determines, to the stockholders entitled to receive the same, upon surrender by the holders of the certificates representing those shares.

In determining fair value, and, if applicable, a fair rate of interest, the Delaware Court of Chancery is required to take into account all relevant factors. In *Weinberger v. UOP, Inc.*, the Delaware Supreme Court discussed the

factors that could be considered in determining fair value in an appraisal proceeding, stating that "proof of value by any techniques or methods which are generally considered acceptable in the financial community and otherwise admissible in court" should be considered, and that "fair price obviously requires consideration of all relevant factors involving the value of a company."

Section 262 provides that fair value is to be "exclusive of any element of value arising from the accomplishment or expectation of the merger." In *Cede & Co. v. Technicolor, Inc.*, the Delaware Supreme Court stated that this exclusion is a "narrow exclusion [that] does not encompass known elements of value," but which rather applies only to the speculative elements of value arising from such accomplishment or expectation. In *Weinberger*, the Delaware Supreme Court construed Section 262 to mean that "elements of future value, including the nature of the enterprise, which are known or susceptible of proof as of the date of the merger and not the product of speculation, may be considered."

Holders of shares of Oncternal's capital stock should be aware that the fair value of such holder's shares as determined under Section 262 could be more than, the same as, or less than the value that such holder is entitled to receive under the terms of the Merger Agreement.

Costs of the appraisal proceeding may be imposed upon the surviving corporation and the stockholders participating in the appraisal proceeding by the Delaware Court of Chancery as the Court deems equitable in the circumstances. Upon the application of a stockholder, the Delaware Court of Chancery may order all or a portion of the expenses incurred by any stockholder in connection with the appraisal proceeding, including, without limitation, reasonable attorneys' fees and the fees and expenses of experts, to be charged pro rata against the value of all shares entitled to appraisal. In the absence of such a determination of assessment, each party bears its own expenses. Any stockholder who had demanded appraisal rights will not, after the Effective Time, be entitled to vote shares subject to that demand for any purpose or to receive payments of dividends or any other distribution with respect to those shares, other than with respect to payment as of a record date prior to the Effective Time; however, if no petition for appraisal is filed within 120 days after the Effective Time, or if the stockholder delivers a written withdrawal of his or her demand for appraisal and an acceptance of the terms of the merger within 60 days after the Effective Time, then the right of that stockholder to appraisal will cease and that stockholder will be entitled to receive the merger consideration for shares of his or her Oncternal capital stock pursuant to the Merger Agreement. Any withdrawal of a demand for appraisal made more than 60 days after the Effective Time may only be made with the written approval of the surviving corporation. No appraisal proceeding in the Delaware Court of Chancery will be dismissed as to any stockholder without the approval of the court.

Failure to follow the steps required by Section 262 for perfecting appraisal rights may result in the loss of appraisal rights. In view of the complexity of Section 262, stockholders who may wish to dissent from the merger and pursue appraisal rights should consult their legal advisors.

THE MERGER AGREEMENT

The following is a summary of the material terms of the Merger Agreement. A copy of the Merger Agreement is attached as Annex A to this proxy statement/prospectus/information statement and is incorporated by reference into this proxy statement/prospectus/information statement. The Merger Agreement has been attached to this proxy statement/prospectus/information statement to provide you with information regarding its terms. It is not intended to provide any other factual information about GTx, Oncternal or Merger Sub. The following description does not purport to be complete and is qualified in its entirety by reference to the Merger Agreement. You should refer to the full text of the Merger Agreement for details of the merger and the terms and conditions of the Merger Agreement.

The Merger Agreement contains representations and warranties that GTx and Merger Sub, on the one hand, and Oncternal, on the other hand, have made to one another as of specific dates. These representations and warranties have been made for the benefit of the other parties to the Merger Agreement and may be intended not as statements of fact but rather as a way of allocating the risk to one of the parties if those statements prove to be incorrect. In addition, the assertions embodied in the representations and warranties are qualified by information in confidential disclosure schedules exchanged by the parties in connection with signing the Merger Agreement. While GTx and Oncternal do not believe that these disclosure schedules contain information required to be publicly disclosed under the applicable securities laws, other than information that has already been so disclosed, the disclosure schedules do contain information that modifies, qualifies and creates exceptions to the representations and warranties set forth in the attached Merger Agreement. Accordingly, you should not rely on the representations and warranties as current characterizations of factual information about GTx or Oncternal, because they were made as of specific dates, may be intended merely as a risk allocation mechanism between GTx, Merger Sub and Oncternal and are modified by the disclosure schedules.

General

Under the Merger Agreement, at the Effective Time, Merger Sub will merge with and into Oncternal, with Oncternal surviving as a wholly-owned subsidiary of GTx.

Merger Consideration

Prior to the Effective Time, each share of Oncternal's preferred stock will be converted into one share of Oncternal common stock. At the Effective Time, each share of Oncternal's common stock outstanding immediately prior to the Effective Time (excluding shares of Oncternal's capital stock held as treasury stock or held by Oncternal, Merger Sub or any subsidiary of Oncternal, and shares held by Oncternal stockholders who have exercised and perfected appraisal rights) will automatically be converted into the right to receive a number of shares of GTx's common stock equal to the exchange ratio.

The Merger Agreement does not include a price-based termination right and there will be no adjustment to the total number of shares of GTx's common stock that Oncternal's stockholders, optionholders and warrantholders will be entitled to receive for changes in the market price of GTx's common stock. Accordingly, the market value of the shares of GTx's common stock issued pursuant to the merger will depend on the market value of the shares of GTx's common stock at the time the merger closes, and could vary significantly from the market value on the date of this proxy statement/prospectus/information statement.

No fractional shares of GTx's common stock will be issuable to Oncternal's stockholders pursuant to the Merger Agreement. Instead, each stockholder of Oncternal who would otherwise be entitled to receive a fraction of a share of GTx's common stock, after aggregating all fractional shares of GTx's common stock issuable to such stockholder, will be entitled to receive in cash the dollar amount, rounded to the nearest whole cent, without interest, determined by multiplying such fraction by volume weighted-average closing trading price of a share of GTx's common stock on Nasdaq for the five consecutive trading days ending five trading days immediately prior to the date upon which the merger becomes effective.

The Merger Agreement provides that, at the Effective Time, GTx will deposit with an exchange agent acceptable to GTx and Oncternal certificates and evidence of book-entry shares representing GTx's common stock issuable to Oncternal's stockholders and a sufficient amount of cash to make payments in lieu of fractional shares.

The Merger Agreement provides that, promptly after the Effective Time, the exchange agent will mail to each record holder of Oncternal's capital stock immediately prior to the Effective Time a letter of transmittal and instructions for surrendering and exchanging stock certificates representing shares of Oncternal's capital stock held by such record holder in exchange for book-entry shares of GTx's common stock. Upon surrender of a stock certificate representing shares of Oncternal's capital stock for exchange to the exchange agent, together with a duly signed letter of transmittal and such other documents as the exchange agent or GTx may reasonably require, the stock certificate surrendered will be cancelled and the holder of such stock certificate will be entitled to receive the following:

- a certificate or certificates or book-entry shares representing the number of whole shares of GTx's common stock that such holder has the right to receive pursuant to the provisions of the Merger Agreement; and
- cash in lieu of any fractional share of GTx's common stock.

At the Effective Time, all holders of certificates representing shares of Oncternal's capital stock that were outstanding immediately prior to the Effective Time will cease to have any rights as stockholders of Oncternal. In addition, no transfer of Oncternal's capital stock after the Effective Time will be registered on the stock transfer books of Oncternal.

If any stock certificate representing shares of Oncternal's capital stock has been lost, stolen or destroyed, GTx may, in its discretion, and as a condition to the delivery of any book-entry shares of GTx's common stock, require the owner of such lost, stolen or destroyed certificate to deliver an affidavit claiming such certificate has been lost, stolen or destroyed and indemnify GTx against any claim suffered by GTx related to the lost, stolen or destroyed certificate or any of GTx's common stock issued in exchange for such certificate as GTx may reasonably request.

From and after the Effective Time, until it is surrendered, each certificate that previously evidenced shares of Oncternal's capital stock will be deemed to represent only the right to receive book-entry shares of GTx's common stock and cash in lieu of any fractional share of GTx's common stock. GTx will not pay dividends or other distributions on any shares of GTx's common stock to be issued in exchange for any unsurrendered stock certificate representing shares of Oncternal until the stock certificate is surrendered as provided in the Merger Agreement.

Treatment of GTx's Stock Awards and Warrants

Prior to the closing of the merger, the GTx Board will adopt appropriate resolutions and take all other actions necessary and appropriate to provide that the vesting of each unexpired and unexercised option to purchase shares of GTx's common stock will be accelerated in full effective as of immediately prior to the Effective Time. The number of shares of GTx's common stock underlying such options and the exercise prices for such options will be appropriately adjusted to reflect the GTx Reverse Stock Split.

Warrants to purchase shares of GTx's common stock will remain outstanding according to their terms. The number of shares of GTx's common stock underlying warrants and the exercise prices for such warrants will be appropriately adjusted to reflect the GTx Reverse Stock Split.

Under the Merger Agreement, as of immediately prior to the closing of the merger (but in no event more than 30 days prior to the Effective Time), GTx shall take all actions necessary to cause the termination and liquidation of the GTx Director Deferred Compensation Plan, and all deferred stock rights thereunder, effective immediately

prior to the closing of the merger, subject to the consummation of the merger (the "GTx Deferred Stock Rights"). GTx shall also ensure that any deferrals under the GTx Director Deferred Compensation Plan on or after January 3, 2019 shall be settled only in cash and that the maximum number of shares of common stock of GTx issuable upon settlement of the GTx Deferred Stock Rights shall be limited to the number of GTx Deferred Stock Rights outstanding as of the date of the Merger Agreement.

Treatment of Oncternal's Awards Options and Warrants

At the Effective Time:

- each option to purchase shares of Oncternal's capital stock outstanding and unexercised immediately prior to the Effective Time under the Oncternal Therapeutics 2015 Equity Incentive Plan, whether or not vested, will be converted into an option to purchase shares of GTx's common stock. GTx will assume the Oncternal Therapeutics 2015 Equity Incentive Plan. From and after the Effective Time, each Oncternal option assumed by GTx may be exercised for such number of shares of GTx's common stock as is determined by multiplying the number of shares of Oncternal's common stock subject to the option by the exchange ratio and rounding that result down to the nearest whole number of shares of GTx's common stock. The per share exercise price of the converted option will be determined by dividing the existing exercise price of the option by the exchange ratio and rounding that result up to the nearest whole cent. Any restrictions on the exercise of any Oncternal option assumed by GTx will continue following the conversion and the term, exercisability, vesting schedules and other provisions of assumed Oncternal options will generally remain unchanged; provided, that any Oncternal options assumed by GTx may be subject to adjustment to reflect changes in GTx's capitalization after the Effective Time and that the GTx Board will succeed to the authority of the Oncternal Board with respect to each assumed Oncternal option; and
- each warrant to purchase shares of Oncternal capital stock outstanding and unexercised immediately prior to the Effective Time will be assumed by GTx and will become a warrant to purchase that number of shares of GTx's common stock equal to the product obtained by multiplying (i) the number of shares of Oncternal's common stock, or the number of shares of Oncternal's common stock issuable upon conversion of the shares of Oncternal's preferred stock issuable upon exercise of the Oncternal warrant, as applicable, that were subject to such warrant immediately prior to the Effective Time by (ii) the exchange ratio and rounding that result down to the nearest whole share. The per share exercise price for GTx's common stock issuable upon exercise of each Oncternal warrant assumed by GTx shall be determined by dividing (a) the per share exercise price of the Oncternal preferred stock subject to such Oncternal warrant, as in effect immediately prior to the Effective Time, by (b) the exchange ratio and rounding that result up to the nearest whole cent. Any restriction on any Oncternal warrant assumed by GTx shall continue in full force and effect and the terms and other provisions of such Oncternal warrant shall otherwise remain unchanged.

In addition, pursuant to the Merger Agreement, at the Effective Time, each restricted share of Oncternal common stock that is outstanding will be converted into a share of GTx on the same basis as other shares of Oncternal common stock. Any restrictions on such restricted shares will continue in full force and effect and the vesting schedule and other provisions of such Oncternal restricted shares shall otherwise remain unchanged.

Directors and Officers of GTx Following the Merger

Pursuant to the Merger Agreement, each of the directors and officers of GTx who will not continue as directors or officers of GTx or the combined organization following the consummation of the merger, shall resign effective upon the closing of the merger. In connection with the merger, the GTx Board will be expanded to include a total nine directors. Pursuant to the terms of the Merger Agreement, two of such directors will be designated by GTx, two of such directors will be designated by SPH USA, Oncternal's largest stockholder prior to the merger, one of such directors will be the Chairman of the combined organization, one of such directors

will be the Chief Executive Officer of the combined organization and the remaining three such directors as indicated in the Merger Agreement. It is anticipated that Michael G. Carter, M.D., Ch.B., F.R.C.P. and Robert J. Wills, Ph.D. will remain as directors of GTx following the closing of the merger, with Dr. Carter remaining among Class III directors, and that all other GTx directors will resign as of the Effective Time. Drs. Carter and Wills shall appoint the remaining directors to the GTx Board to fill the resulting vacancies. David F. Hale is expected to be appointed to the board as Chairman of the board of directors and James B. Breitmeyer, M.D., Ph.D. is expected to be appointed to the board pursuant to his role as Chief Executive Officer. It is anticipated that Yanjun Liu, Ph.D. and Xin Nakanishi, Ph.D. will be appointed as the designees of SPH USA and that Charles P. Theuer, M.D., Ph.D., William R. LaRue and Daniel L. Kisner, M.D. will be appointed to the remaining three director positions. It is anticipated that GTx's executive officers upon the closing of the merger will be Dr. Breitmeyer, President and Chief Executive Officer, Richard G. Vincent, Chief Financial Officer and Hazel M. Aker, General Counsel.

Amendment to the Restated Certificate of Incorporation of GTx

Stockholders of record of GTx's common stock on the record date for the GTx special meeting will also be asked to approve Proposal Nos. 2 and 3, which include an amendment to the restated certificate of incorporation of GTx to effect the GTx Reverse Stock Split and the GTx Name Change, in each case, upon consummation of the merger, each of which requires the affirmative vote of holders of shares representing a majority of all shares of GTx's common stock outstanding on the record date for the GTx special meeting.

Conditions to the Completion of the Merger

Each party's obligation to complete the merger is subject to the satisfaction or waiver by each of the parties, at or prior to the merger, of various conditions, which include the following:

- the registration statement on Form S-4, of which this proxy statement/prospectus/information statement is a part, must have been declared effective by the SEC in accordance with the Securities Act and must not be subject to any stop order or proceeding, or any proceeding threatened by the SEC, seeking a stop order that has not been withdrawn;
- there must not have been issued, and remain in effect, any temporary restraining order, preliminary or permanent injunction or other order preventing the consummation of the merger or any of the other transactions contemplated by the Merger Agreement by any court of competent jurisdiction or other governmental entity of competent jurisdiction, and no law, statute, rule, regulation, ruling or decree shall be in effect which has the effect of making the consummation of the merger or any of the other transactions contemplated by the Merger Agreement illegal;
- the holders of a (i) a majority of the outstanding shares of Oncternal's common stock and preferred stock, voting together as one class, (ii) at least 60% of the outstanding shares of Oncternal's preferred stock, voting together as a single class, (iii) at least a majority of the outstanding shares of Oncternal's Series A preferred stock, voting as a separate class, (iv) a majority of the outstanding shares of Oncternal's Series B preferred stock and Series B-2 preferred stock, voting together as a single class, and (v) at least 70% of the shares of Oncternal's Series C preferred stock, voting as a separate class, must have adopted and approved the merger;
- the holders of a majority of the outstanding shares of GTx's common stock having voting power present in person or represented by proxy at the GTx special meeting must have approved Proposal No. 1, the approval of the Merger Agreement and the transactions contemplated thereby, including the merger and the issuance of GTx's common stock in the merger;
- the existing shares of GTx's common stock must have been continually listed on Nasdaq through the closing of the merger, and GTx must have caused the shares of GTx's common stock to be issued in the merger to be approved for listing on Nasdaq (subject to official notice of issuance) as of the closing of the merger; and

- all applicable waiting periods (and any extension thereof) applicable to the merger under the Hart-Scott-Rodino Antitrust Improvements Act of 1976 shall must have expired or early termination of such waiting periods must have been granted and all applicable foreign antitrust approvals must have been obtained.

In addition, each party's obligation to complete the merger is subject to the satisfaction or waiver by that party of the following additional conditions:

- the representations and warranties regarding certain matters related to organization, authority, vote required, capitalization and financial advisors of the other party in the Merger Agreement must be true and correct in all material respects on the date of the Merger Agreement and on the closing date of the merger with the same force and effect as if made on the date on which the merger is to be completed or, if such representations and warranties address matters as of a particular date, then as of that particular date;
- the remaining representations and warranties of the other party in the Merger Agreement must be true and correct on the date of the Merger Agreement and on the closing date of the merger with the same force and effect as if made on the date on which the merger is to be completed or, if such representations and warranties address matters as of a particular date, then as of that particular date, except in each case, or in the aggregate, where the failure to be so true and correct would not reasonably be expected to have a Company Material Adverse Effect or Parent Material Adverse Effect (each as defined in the Merger Agreement), as applicable (without giving effect to any references therein to any Company Material Adverse Effect or Parent Material Adverse Effect, as applicable, or other materiality qualifications);
- the other party to the Merger Agreement must have performed or complied with in all material respects all of such party's agreements and covenants required to be performed or complied with by it under the Merger Agreement at or prior to the Effective Time;
- the other party must have delivered certain certificates and other documents required under the Merger Agreement for the closing of the merger;
- the party must have received from the other party lock-up agreements executed by certain stockholders of such party (including any stockholder of Oncternal expected to own more than 10% of the outstanding common stock of the combined organization after the merger) and each person who shall be elected or appointed as an executive officer or director of such party immediately following the closing;
- the party must have received the opinion of its legal counsel, dated as of the closing date of the merger, to the effect that the merger will be treated, for U.S. federal income tax purposes, as a reorganization within the meaning of Section 368(a) of the Code; and
- the party must have received a copy of the opinion of the other party's legal counsel, and dated as of the closing date of the merger, to the effect that the merger will be treated, for U.S. federal income tax purposes, as a reorganization within the meaning of Section 368(a) of the Code.

In addition, the obligation of GTx and Merger Sub to complete the merger is further subject to the satisfaction or waiver of the following conditions:

- there shall have been no effect, change, event, circumstance, or development that (considered together with all other effects, changes, events, circumstances, or developments that have occurred prior to the applicable date of determination) has or would reasonably be expected to have a material adverse effect on the business, financial condition, assets, liabilities or results of operations of Oncternal or its subsidiaries, taken as a whole (a "Company Material Adverse Effect"); provided that effects, changes,

events, circumstances or developments resulting from the following shall not be taken into account for purposes of determining whether a Company Material Adverse Effect shall have occurred:

- any general business, economic or political conditions affecting the industry in which Oncternal or its subsidiaries operate;
- any natural disaster or any acts of war, armed hostilities or terrorism;
- any changes in financial, banking or securities markets;
- any failure of Oncternal to meet internal or analysts' expectations or projections or the results of Oncternal;
- any clinical trial programs or studies, including any adverse data, event or outcome arising out of or relating to any such programs or studies;
- any change in, or any compliance with or action taken for the purpose of complying with any law or U.S. GAAP;
- resulting from the announcement of the Merger Agreement or the pendency of the transactions contemplated by the Merger Agreement; or
- resulting from the taking of any action, or the failure to take any action, by Oncternal that is required to be taken pursuant to the Merger Agreement.

- GTx shall have received (i) an original signed statement from Oncternal that Oncternal is not, and has not been at any time during the applicable period specified in Section 897(c)(1)(A)(ii) of the Code, a "United States real property holding corporation," as defined in Section 897(c)(2) of the Code, conforming to the requirements of Treasury Regulations Section 1.1445-2(c)(3) and 1.897-2(h), and (ii) an original signed notice to be delivered to the IRS in accordance with the provisions of Treasury Regulations Section 1.897-2(h)(2), together with written authorization for GTx to deliver such notice to the IRS on behalf of Oncternal following the closing of the merger, each dated as of the closing date of the merger, duly executed by an authorized officer of Oncternal, and in form and substance reasonably acceptable to GTx;
- certain agreements between Oncternal and its stockholders must have been terminated; and
- all Oncternal preferred stock must have been converted to Oncternal common stock.

In addition, the obligation of Oncternal to complete the merger is further subject to the satisfaction or waiver of the following conditions:

- there shall have been no effect, change, event, circumstance, or development that (considered together with all other effects, changes, circumstances, or developments that have occurred prior to the applicable date of determination) has or would reasonably be expected to have a material adverse effect on the business, financial condition, assets, liabilities or results of operations of GTx and its subsidiaries, taken as a whole (a "Parent Material Adverse Effect"); provided, that effects, changes, events, circumstances or developments resulting from the following shall not be taken into account for purposes of determining whether a Parent Material Adverse Effect shall have occurred:
  - any general business, economic or political conditions affecting the industry in which GTx operates;
  - any natural disaster or any acts of war, armed hostilities or terrorism;
  - any changes in financial, banking or securities markets;
  - any change in the stock price or trading volume of GTx common stock (it being understood, however, that any effects, changes, events, circumstances or developments causing or contributing to any change in stock price or trading volume of GTx common stock may be taken into account in determining whether a Parent Material Adverse Effect has occurred, unless such effects, changes, events, circumstances or developments or otherwise are specifically excepted);

- any failure of GTx to meet internal or analysts' expectations or projections or the results of GTx;
- any clinical trial programs or studies, including any adverse data, event or outcome arising out of or relating to any such programs or studies;
- any change in, or any compliance with or action taken for the purpose of complying with any law or U.S. GAAP;
- resulting from the announcement of the Merger Agreement or the pendency of the transactions contemplated by the Merger Agreement; or
- resulting from the taking of any action, or the failure to take any action, by GTx that is required to be taken pursuant to the Merger Agreement.

- Oncternal must have received the resignations of each of the officers and directors of GTx who are not to continue as officers and directors of the combined organization after the merger; and
- GTx must have caused the GTx board of directors to be constituted as required by the Merger Agreement.

Representations and Warranties

The Merger Agreement contains customary representations and warranties of GTx and Oncternal for a transaction of this type relating to, among other things:

- corporate organization and power, and similar corporate matters;
- subsidiaries;
- authority to enter into the Merger Agreement and the related agreements;
- votes required for completion of the merger and approval of the proposals that will come before the GTx special meeting and that will be the subject of Oncternal's stockholder written consent;
- except as otherwise specifically disclosed pursuant to in the Merger Agreement, the fact that the consummation of the merger would not contravene or require the consent of any third-party;
- capitalization;
- financial statements and with respect to GTx, documents filed with the SEC and the accuracy of information contained in those documents;
- material changes or events;
- liabilities;
- title to assets;
- real property and leaseholds;
- intellectual property;
- the validity of material contracts to which the parties or their subsidiaries are a party and any violation, default or breach to such contracts;
- regulatory compliance, permits and restrictions;
- legal proceedings and orders;
- tax matters;
- employee and labor matters and benefit plans;
- environmental matters;

- insurance;
- any brokerage or finder's fee or other fee or commission in connection with the merger;
- transactions with affiliates;
- anti-bribery laws; and
- with respect to GTx, the valid issuance in the merger of GTx's common stock and the opinion of Aquilo.

The representations and warranties are, in many respects, qualified by materiality and knowledge, and will not survive the merger, but their accuracy forms the basis of one of the conditions to the obligations of GTx and Oncternal to complete the merger.

No Solicitation

Each of GTx and Oncternal agreed that during the period commencing on the date of the Merger Agreement and ending on the earlier of the consummation of the merger or the termination of the Merger Agreement, except as described below, GTx and Oncternal and any of their respective subsidiaries will not, nor will either party or any of its subsidiaries authorize any of the directors, officers, employees, agents, attorneys, accountants, investment bankers, advisors or representatives retained by it or any of its subsidiaries to, directly or indirectly:

- solicit, initiate or knowingly encourage, induce or facilitate the communication, making, submission or announcement of, any "acquisition proposal" or "acquisition inquiry" or take any action that could reasonably be expected to lead to an acquisition proposal or acquisition inquiry;
- furnish any non-public information with respect to it to any person in connection with or in response to an acquisition proposal or acquisition inquiry;
- engage in discussions or negotiations with any person with respect to any acquisition proposal or acquisition inquiry;
- approve, endorse or recommend an acquisition proposal;
- execute or enter into any letter of intent or similar document or any contract contemplating or otherwise relating to any acquisition transaction (other than a confidentiality agreement permitted by the Merger Agreement); or
- publicly propose to do any of the above.

An "acquisition inquiry" means an inquiry, indication of interest or request for information (other than an inquiry, indication of interest or request for information made or submitted by Oncternal, on the one hand, or GTx, on the other hand, to the other party) that would reasonably be expected to lead to an acquisition proposal.

An "acquisition proposal" means any offer or proposal, whether written or oral (other than an offer or proposal made or submitted by or on behalf of Oncternal or any of its affiliates, on the one hand, or by or on behalf of GTx or any of its affiliates, on the other hand, to the other party) contemplating or otherwise relating to any "acquisition transaction."

An "acquisition transaction" means any transaction or series of related transactions involving:

- any merger, consolidation, amalgamation, share exchange, business combination, issuance or acquisition of securities, reorganization, recapitalization, tender offer, exchange offer or similar transaction: (i) in which GTx, Oncternal or Merger Sub is a constituent entity, (ii) in which any individual, entity, governmental entity, or "group," as defined under applicable securities laws, directly or indirectly acquires beneficial or record ownership of securities representing more than 20% of the

outstanding securities of any class of voting securities of GTx, Oncternal or Merger Sub or any of their respective subsidiaries or (iii) in which GTx, Oncternal or Merger Sub or any of their respective subsidiaries issues securities representing more than 20% of the outstanding securities of any class of voting securities of such party or any of its subsidiaries; or

- any sale, lease, exchange, transfer, license, acquisition or disposition of any business or businesses or assets that constitute or account for 20% or more of the consolidated book value or the fair market value of the assets of GTx, Oncternal or Merger Sub and their respective subsidiaries, as applicable, taken as a whole.

Notwithstanding the foregoing, before obtaining the applicable approvals of the stockholders of GTx or Oncternal required to consummate the merger, as applicable, each party may furnish non-public information regarding such party and its subsidiaries to, and may enter into discussions or negotiations with, any third-party in response to a bona fide acquisition proposal made or received after the date of the Merger Agreement, which such party's board of directors determines in good faith, after consultation with such party's outside financial advisors or outside legal counsel, constitutes or is reasonably likely to result in a "superior offer," as defined below, if:

- neither such party nor any representative of such party has materially breached the solicitation provisions of the Merger Agreement described above;
- such party's board of directors concludes in good faith, based on the advice of outside legal counsel, that the failure to take such action is reasonably likely to be inconsistent with the fiduciary duties of such board of directors under applicable legal requirements;
- such party gives the other party at least two business days' prior written notice of the identity of the third-party and of that party's intention to furnish information to, or enter into discussions with, such third-party before furnishing any information or entering into discussions with such third-party;
- such party receives from the third-party an executed confidentiality agreement containing provisions at least as favorable to such party as those contained in the confidentiality agreement between GTx and Oncternal; and
- at least two business days prior to the furnishing of any non-public information to a third-party, such party furnishes the same non-public information to the other party to the extent not previously furnished.

A "superior offer" means an unsolicited, bona fide written acquisition proposal (with all references to 20% in the definition of acquisition transaction being treated as references to greater than 80% for these purposes) that (a) was not obtained or made as a direct or indirect result of a breach, or violation, of the Merger Agreement, and (b) is on terms and conditions that the board of directors of the party receiving the offer determines in good faith, based on such matters that it deems relevant (including the likelihood of consummation of the transaction), as well as any written offer by the other party to the Merger Agreement to amend the terms of the Merger Agreement, and following consultation with outside legal counsel and outside financial advisors, if any, are more favorable, from a financial point of view, to that party's stockholders than the terms of the merger. An acquisition proposal will not be considered a superior offer if any financing required to consummate the transaction contemplated by such acquisition proposal is not reasonably capable of being obtained by such third-party.

The Merger Agreement also provides that each party will promptly advise the other of the status and terms of, and keep the other party reasonably informed with respect to, any acquisition proposal or any inquiry, indication of interest or request for information that would reasonably be expected to lead to an acquisition proposal or any material change or proposed material change to that acquisition proposal or inquiry, indication of interest or request for information that would reasonably be expected to lead to an acquisition proposal.

Meetings of Stockholders

GTx is obligated under the Merger Agreement to call, give notice of and hold the GTx special meeting for the purposes of considering the approval of the Merger Agreement and the transactions contemplated thereby, including the merger and the issuance of shares of GTx's common stock to Oncternal's stockholders in the merger.

Oncternal is obligated under the Merger Agreement to obtain written consents of its stockholders sufficient to adopt the Merger Agreement thereby approving the merger and related transactions within ten business days following the registration statement on Form S-4, of which this proxy statement/prospectus/information statement is a part, being declared effective by the SEC.

Covenants; Conduct of Business Pending the Merger

GTx has agreed that, except as permitted by the Merger Agreement, as required by law, or unless Oncternal shall have provided written consent, during the period commencing on the date of the Merger Agreement and continuing until the earlier to occur of the closing of the merger and the termination of the Merger Agreement, GTx will conduct its business and operations in the ordinary course consistent with past practices and in compliance with all applicable laws, regulations and certain contracts, and to take other agreed-upon actions. GTx has also agreed that, subject to certain limited exceptions, without the consent of Oncternal, it will not, during the period commencing on the date of the Merger Agreement and continuing until the earlier to occur of the closing of the merger and the termination of the Merger Agreement:

- declare, accrue, set aside or pay any dividend or make any other distribution in respect of any shares of capital stock or repurchase, redeem or otherwise reacquire any shares of capital stock or other securities (except in connection with the payment of withholding taxes incurred upon the exercise, settlement or vesting of any award granted under a GTx employee benefit plan in accordance with the terms of such award in effect on the date of the Merger Agreement);
- sell, issue, grant, pledge or otherwise dispose of or encumber or authorize any of the foregoing with respect to: any capital stock or other security (except for GTx's common stock issued upon the valid exercise of outstanding options or warrants to purchase shares of GTx's common stock); any option, warrant or right to acquire any capital stock or any other security; or any instrument convertible into or exchangeable for any capital stock or other security of GTx;
- except as required to give effect to anything in contemplation of the closing of the merger, amend the certificate of incorporation, bylaws or other charter or organizational documents of GTx, or effect or be a party to any merger, consolidation, share exchange, business combination, recapitalization, reclassification of shares, stock split, reverse stock split or similar transaction except as related to the proposed transactions under the Merger Agreement;
- form any subsidiary or acquire any equity interest or other interest in any other entity or enter into any joint venture with any other entity;
- lend money to any person; incur or guarantee any indebtedness for borrowed money; guarantee any debt securities of others; or make any capital expenditure or commitment in excess of the amounts set forth in GTx's operating budget delivered to Oncternal concurrently with the Merger Agreement;
- other than as required by law or the terms of a GTx employee plan in effect as of the date of the Merger Agreement, adopt, terminate, establish or enter into any GTx employee plan; cause or permit any GTx employee plan to be amended in any material respect, other than approval of the GTx 2019 Plan; pay any bonus or make any profit-sharing or similar payment to, or increase the amount of the wages, salary, commissions, fringe benefits or other compensation or remuneration payable to, any of its employees, officers or directors; increase the severance, retention or change of control benefits offered to any current or former or new employees, directors or consultants; hire or retain any new officer, employees or consultants; or terminate or give notice of termination to any officer or employee, other than termination for cause;

- recognize any labor union, labor organization, or similar entity except as otherwise required by law and after advance notice to Oncternal;
- enter into any transaction other than in the ordinary course of business;
- enter into any transaction with respect to the SARD Compound or SARM Compound (each, as defined in the CVR Agreement);
- acquire any material asset or sell, lease or otherwise irrevocably dispose of any of its material assets or properties, or grant any encumbrance with respect to such assets or properties;
- make, change or revoke any material tax election, fail to pay any income or other material tax as such tax becomes due and payable, file any amendment making any material change to any tax return, settle or compromise any income or other material tax liability, enter into any tax allocation, sharing, indemnification or other similar agreement or arrangement (other than customary commercial contracts entered into in the ordinary course of business the principal subject matter of which is not taxes), request or consent to any extension or waiver of any limitation period with respect to any claim or assessment for any income or other material taxes (other than pursuant to an extension of time to file any tax return granted in the ordinary course of business of not more than six months), or adopt or change any material accounting method in respect of taxes;
- enter into, materially amend or terminate certain material contracts;
- except as otherwise set forth in the GTx operating budget delivered to Oncternal concurrently with the execution of the Merger Agreement (and other than incurrence or payment of GTx transaction expenses up to an aggregate of $100,000 in excess of the amount budgeted for the aggregate GTx transaction expenses in the GTx operating budget provided to Oncternal), make any expenditures, incur any liabilities or discharge or satisfy any liabilities, in each case, in amounts that exceed the aggregate amount of the GTx operating budget;
- other than as required by law or U.S. GAAP, take any action to change accounting policies or procedures;
- initiate or settle any legal proceeding; or
- agree, resolve or commit to do any of the foregoing.

Oncternal has agreed that, except as permitted by the Merger Agreement, as required by law, or unless GTx shall have provided written consent, during the period commencing on the date of the Merger Agreement and continuing until the earlier to occur of the closing of the merger and the termination of the Merger Agreement, Oncternal will conduct its business and operations in the ordinary course consistent with past practices and in compliance with all applicable laws, regulations and certain contracts, and to take other agreed-upon actions. Oncternal has also agreed that, subject to certain limited exceptions, without the consent of GTx, it will not, during the period commencing on the date of the Merger Agreement and continuing until the earlier to occur of the closing of the merger and the termination of the Merger Agreement:

- declare, accrue, set aside or pay any dividend or make any other distribution in respect of any shares of capital stock of Oncternal or repurchase, redeem or otherwise reacquire any shares of capital stock or other securities (except for shares of Oncternal common stock from terminated employees, directors or consultants of Oncternal);
- except as required to give effect to anything in contemplation of the closing of the merger, amend the certificate of incorporation, bylaws or other charter or organizational documents of Oncternal or its subsidiaries, or effect or become a party to any merger, consolidation, share exchange, business combination, recapitalization, reclassification of shares, stock split, reverse stock split or similar transaction except as related to the proposed transactions under the Merger Agreement;
- sell, issue, grant, pledge or otherwise dispose of or encumber or authorize any of the foregoing actions with respect to: any capital stock or other security of Oncternal or any of its subsidiaries (except for

shares of Oncternal common stock issued upon the valid exercise of Oncternal options or warrants); any option, warrant or right to acquire any capital stock or any other security; or any other instrument convertible into or exchangeable for any capital stock or any other security of Oncternal or its subsidiaries;

- except as required to give effect to anything in contemplation of the closing of the merger, amend the certificate of incorporation, bylaws or other charter or organizational documents of Oncternal or its subsidiaries, or effect or be a party to any merger, consolidation, share exchange, business combination, recapitalization, reclassification of shares, stock split, reverse stock split or similar transaction except as related to the proposed transactions under the Merger Agreement;
- form any subsidiary or acquire any equity interest or other interest in any other entity or enter into a joint venture with any other entity;
- lend money to any person; incur or guarantee any indebtedness for borrowed money; guarantee any debt securities of others; or make any capital expenditure or commitment in excess of $500,000;
- other than as required by applicable law or the terms of any Oncternal employee benefit plan: adopt, terminate, establish or enter into any employee plan; cause or permit any employee plan to be amended in any material respect; pay any bonus or make any profit-sharing or similar payment to, or increase the amount of the wages, salary, commissions, benefits or other compensation or remuneration payable to, any of its directors, officers or employees; increase the severance or change of control benefits offered to any current or new employees, directors or consultants; or terminate or give notice of termination to any officer or any employee whose annual base salary is expected to be more than $125,000 per year, other than any termination for cause;
- recognize any labor union, labor organization or similar entity, except as otherwise required by law and after advance notice to GTx;
- enter into any transaction other than in the ordinary course of business;
- acquire any material asset or sell, lease or otherwise irrevocably dispose of any of its material assets or properties, or grant any encumbrance with respect to such assets or properties;
- sell, assign, transfer, license, sublicense or otherwise dispose of any material Oncternal intellectual property rights (other than pursuant to non-exclusive licenses in the ordinary course of business);
- make, change or revoke any material tax election, fail to pay any income or other material tax as such tax becomes due and payable, file any amendment making any material change to any tax return, settle or compromise any income or other material tax liability, enter into any tax allocation, sharing, indemnification or other similar agreement or arrangement (other than customary commercial contracts entered into in the ordinary course of business the principal subject matter of which is not taxes), request or consent to any extension or waiver of any limitation period with respect to any claim or assessment for any income or other material taxes (other than pursuant to an extension of time to file any tax return granted in the ordinary course of business of not more than six months), or adopt or change any material accounting method in respect of taxes;
- enter into, materially amend or terminate certain material contracts;
- other than incurrence or payment of any Oncternal transaction expenses, make any expenditures, incur any liabilities or discharge or satisfy any liabilities, in each case, in amounts that exceed $500,000 in the aggregate;
- other than as required by law or U.S. GAAP, take any action to change accounting policies or procedures;
- initiate or settle any legal proceeding; or
- agree, resolve or commit to do any of the foregoing.

Other Agreements

Each of GTx and Oncternal has agreed to use its commercially reasonable efforts to cause to be taken all actions necessary to consummate the merger and the other transactions contemplated by the Merger Agreement. In connection therewith, each party has agreed to: file or otherwise submit all applications and notices required to be filed in connection with the merger and the other transactions contemplated by the Merger Agreement;

- use commercially reasonable efforts to obtain each consent reasonably required to be obtained in connection with the merger and the other transactions contemplated by the Merger Agreement;
- use commercially reasonable efforts to lift any injunction prohibiting, or any other legal bar to, the merger or the other transactions contemplated by the Merger Agreement; and
- use commercially reasonable efforts to satisfy the conditions precedent to the consummation of the transactions contemplated by the Merger Agreement.

Pursuant to the Merger Agreement, GTx and Oncternal have further agreed that:

- GTx will use its commercially reasonable efforts to (i) maintain the listing of its common stock on Nasdaq until the closing of the merger and to obtain approval for listing of the combined organization on Nasdaq and (ii) to the extent required by the rules and regulations of Nasdaq, to prepare and submit to Nasdaq a notification form for the listing of the shares of GTx common stock to be issued in connection with the merger and to cause such shares to be approved for listing (subject to official notice of issuance); (iii) to effect the GTx Reverse Stock Split; and (iv) to the extent required by Nasdaq Marketplace Rule 5110, to file an initial listing application for GTx's common stock on Nasdaq and to cause such listing application to be conditionally approved prior to the Effective Time;
- for a period of six years after the closing of the merger, GTx will indemnify each of the directors and officers of GTx and Oncternal to the fullest extent permitted under the DGCL and will maintain directors' and officers' liability insurance for the directors and officers of GTx and Oncternal; and
- GTx shall maintain directors' and officers' liability insurance policies commencing at the closing of the merger, on commercially reasonable terms and conditions and with coverage limits customary for U.S. public companies similarly situated to GTx.

Termination

The Merger Agreement may be terminated at any time before the completion of the merger, whether before or after the required stockholder approvals to complete the merger have been obtained, as set forth below:

- by mutual written consent of GTx and Oncternal;
- by either GTx or Oncternal if the merger shall not have been consummated by August 6, 2019 (the "End Date"); provided, however, that this right to terminate the Merger Agreement will not be available to any party whose action or failure to act has been a principal cause of the failure of the merger to occur on or before the End Date and such action or failure to act constitutes a breach of the Merger Agreement; and provided, further, that the End Date shall be extended by 60 days upon request of either party if a request for additional information has been made by any government authority, or in the event that the SEC has not declared effective the registration statement on Form S-4, of which this proxy statement/prospectus/information statement is a part, by such date;
- by either GTx or Oncternal if a court of competent jurisdiction or governmental entity has issued a final and nonappealable order, decree or ruling or taken any other action that has the effect of permanently restraining, enjoining or otherwise prohibiting the merger or any of the other transactions contemplated by the Merger Agreement;
- by GTx if the Required Oncternal Stockholder Approval has not been obtained within the later of (i) 15 business days of the registration statement on Form S-4, of which this proxy statement/prospectus/

information statement is a part, becoming effective or (ii) the date on which GTx stockholders have approved Proposal Nos. 1 and 2; provided that this right to terminate the Merger Agreement will not be available to GTx once Oncternal obtains such stockholder approval;

- by either GTx or Oncternal if the GTx special meeting shall have been held and completed and GTx's stockholders shall have taken a final vote and shall not have approved Proposal Nos. 1 and 2; provided, that GTx may not terminate the Merger Agreement pursuant to this provision if the failure to obtain the approval of GTx's stockholders was caused by the action or failure to act of GTx or Merger Sub and such action or failure to act constitutes a material breach by GTx or Merger Sub of the Merger Agreement;
- by Oncternal, at any time prior to the approval by GTx's stockholders of the proposals to be considered at the GTx special meeting, if any of the following circumstances shall occur (each of the following, a "GTx triggering event"):
    - The GTx Board fails to recommend that the stockholders of GTx vote to approve Proposal Nos. 1 and 2 or withdraws or modifies its recommendation in a manner adverse to Oncternal;
    - GTx fails to include in this proxy statement/prospectus/information statement such recommendation;
    - The GTx Board, or any committee thereof, publicly approves, endorses or recommends any acquisition proposal;
    - GTx enters into any letter of intent or similar document or any contract relating to any acquisition proposal, other than a confidentiality agreement permitted pursuant to the Merger Agreement; or
    - GTx or any director, officer or agent of GTx willfully and intentionally breaches the no solicitation provisions or the provisions regarding the GTx special meeting set forth in the Merger Agreement;
- by GTx, at any time prior to the adoption of the Merger Agreement by Oncternal's stockholders, if any of the following circumstances shall occur (each an "Oncternal triggering event"):
    - The Oncternal Board fails to recommend that Oncternal's stockholders vote to adopt the Merger Agreement, thereby approving the merger, or withdraws or modifies its recommendation in a manner adverse to GTx;
    - The Oncternal Board, or any committee thereof, publicly approves, endorses or recommends any acquisition proposal;
    - Oncternal enters into any letter of intent or similar document or any contract relating to any acquisition proposal; or
    - Oncternal or any director, officer or agent of Oncternal willfully and intentionally breaches the no solicitation provisions set forth in the Merger Agreement; or
- by GTx or Oncternal if the other party has breached any of its representations, warranties, covenants or agreements contained in the Merger Agreement or if any representation or warranty of the other party has become inaccurate, in either case such that the conditions to the closing of the merger would not be satisfied as of time of such breach or inaccuracy, but if such breach or inaccuracy is curable, then the Merger Agreement will not terminate pursuant to this provision as a result of a particular breach or inaccuracy until the expiration of a 15-day period after delivery of written notice of such breach.

Termination Fee

Fee payable by GTx

GTx must pay Oncternal a termination fee of $2.0 million if:

- the Merger Agreement is terminated by either GTx or Oncternal if the GTx special meeting shall have been held and completed, and GTx's stockholders shall have not approved Proposal Nos. 1 and 2; or
- the Merger Agreement is terminated by GTx after the End Date and GTx's stockholders have not approved Proposal Nos. 1 and 2.

GTx must pay Oncternal a termination fee of $1.0 million if the Merger Agreement is terminated by Oncternal if (i) prior to the GTx stockholder approval of Proposal Nos. 1 and 2, a GTx triggering event shall have occurred, (ii) at any time after the date of Merger Agreement and before the termination of the Merger Agreement, an acquisition proposal with respect to GTx was publicly announced, disclosed or otherwise communicated to the board of directors of GTx, and (iii) within 12 months after the date of such termination, GTx enters into a definitive agreement for or consummates an acquisition transaction.

GTx must pay Oncternal a termination fee of $500,000 if the Merger Agreement is terminated by Oncternal because GTx or Merger Sub has breached any of its representations, warranties, covenants or agreements contained in the Merger Agreement or if any representation or warranty of GTx or Merger Sub has become inaccurate, in either case such that the conditions to the closing of the merger would not be satisfied as of the time of such breach or inaccuracy, subject to a 15-day cure period.

Fee payable by Oncternal

Oncternal must pay GTx a termination fee of $2.0 million if:

- the Merger Agreement is terminated by GTx if the Required Oncternal Stockholder Approval has not been obtained within the later of (i) 15 business days of the registration statement on Form S-4, of which this proxy statement/prospectus/information statement is a part, becoming effective or (ii) the date on which GTx stockholders have approved Proposal Nos. 1 and 2; or
- the Merger Agreement is terminated by Oncternal after the End Date and Oncternal has not obtained the Required Oncternal Stockholder Approval at the time of such termination.

Oncternal must pay GTx a termination fee of $1.0 million if the Merger Agreement is terminated by Oncternal if (i) prior to obtaining the Required Oncternal Stockholder Approval, an Oncternal triggering event shall have occurred, (ii) at any time after the date of Merger Agreement and before the termination of the Merger Agreement, an acquisition proposal with respect to Oncternal was publicly announced, disclosed or otherwise communicated to the board of directors of Oncternal, and (iii) within 12 months after the date of such termination, Oncternal enters into a definitive agreement for or consummates an acquisition transaction.

Oncternal must pay GTx a termination fee of $500,000 if the Merger Agreement is terminated by GTx because Oncternal has breached any of its representations, warranties, covenants or agreements contained in the Merger Agreement or if any representation or warranty of Oncternal has become inaccurate, in either case such that the conditions to the closing of the merger would not be satisfied as of the time of such breach or inaccuracy, subject to a 15-day cure period.

Amendment

The Merger Agreement may be amended by the parties at any time if such amendment is in writing, is approved by the boards of directors of each party to the Merger Agreement and is signed by each party to the Merger Agreement, except that after the Merger Agreement has been adopted and approved by the stockholders of GTx or Oncternal, no amendment which by law requires further approval by the stockholders of GTx or Oncternal, as the case may be, shall be made without such further approval.

AGREEMENTS RELATED TO THE MERGER

CVR Agreement

Prior to the closing of the merger, GTx, Marc Hanover, as representative of holders of the CVRs, and a rights agent will enter into the CVR Agreement. Pursuant to the CVR Agreement, GTx stockholders will receive one CVR for each share of GTx common stock held of record immediately prior to the Effective Time, after giving effect to the GTx Reverse Stock Split. Each CVR will represent the right to receive payments based on GTx's SARD or SARM technology. In particular, CVR holders will be entitled to, in the aggregate, 50% of any net proceeds received during the 15-year period after the Closing from the grant, sale or transfer of rights to GTx's SARD or SARM technology that occurs during the 10-year period after the Closing (or in the 11th year if based on a term sheet approved during the initial 10-year period) and, if applicable, to receive royalties on the sale of any SARD or SARM products by the combined company during the 15-year period after the Closing. In order to be eligible for the CVR, a GTx stockholder must be a holder of record as of immediately prior to the Effective Time. Under the CVR Agreement, Oncternal (as successor in interest to GTx) agreed to use commercially reasonable efforts to develop SARD products and to divest SARM technology, subject to certain limitations.

The sole right of the holders of CVRs is to receive cash from GTx, if any, through the rights agent in accordance with the CVR Agreement. The CVRs will not have any voting or dividend rights, will not represent any equity or ownership interest in GTx or its subsidiaries, and interest will not accrue on any amounts payable on the CVRs. The CVRs will not be transferable, except in certain limited circumstances, will not be certificated or evidenced by any instrument and will not be registered with the SEC or any state and will not listed for trading on any exchange.

Material U.S. Federal Income Tax Consequences of the Receipt of CVRs

The following discussion is a summary of the material U.S. federal income tax consequences of the receipt of CVRs to GTx U.S. Holders (as defined below) who receive CVRs with respect to GTx common stock, but this discussion does not purport to be a complete analysis of all potential tax consequences that may be relevant to a GTx U.S. Holder. The effects of other U.S. federal tax laws, such as estate and gift tax laws, and any applicable state, local or non-U.S. tax laws are not discussed. This discussion is based on the Code, Treasury Regulations promulgated thereunder, judicial decisions, and published rulings and administrative pronouncements of the IRS, in each case in effect as of the date hereof. These authorities may change or be subject to differing interpretations. Any such change or differing interpretation may be applied retroactively in a manner that could adversely affect a GTx U.S. Holder. GTx has not sought and does not intend to seek any rulings from the IRS regarding the matters discussed below. There can be no assurance the IRS or a court will not take a position contrary to that discussed below regarding the tax consequences of the receipt of CVRs.

This discussion is limited to GTx U.S. Holders that hold GTx common stock as a "capital asset" within the meaning of Section 1221 of the Code (generally, property held for investment). This discussion does not address all U.S. federal income tax consequences relevant to a GTx U.S. Holder's particular circumstances, including the impact of the alternative minimum tax or the Medicare contribution tax on net investment income. In addition, it does not address consequences relevant to GTx U.S. Holders subject to special rules, including, without limitation:

- U.S. expatriates and former citizens or long-term residents of the United States;
- GTx U.S. Holders whose functional currency is not the U.S. dollar;
- persons holding GTx common stock as part of a hedge, straddle or other risk reduction strategy or as part of a conversion transaction or other integrated investment;
- banks, insurance companies, and other financial institutions;

- real estate investment trusts or regulated investment companies;
- brokers, dealers or traders in securities;
- "controlled foreign corporations," "passive foreign investment companies," and corporations that accumulate earnings to avoid U.S. federal income tax;
- S corporations, partnerships or other entities or arrangements treated as partnerships for U.S. federal income tax purposes (and investors therein);
- persons for whom GTx common stock constitutes "qualified small business stock" within the meaning of Section 1202 of the Code;
- tax-exempt organizations or governmental organizations;
- persons subject to special tax accounting rules as a result of any item of gross income with respect to GTx common stock being taken into account in an "applicable financial statement" (as defined in the Code);
- persons deemed to sell GTx common stock under the constructive sale provisions of the Code;
- persons who hold or received GTx common stock pursuant to the exercise of any employee stock option or otherwise as compensation; and
- tax-qualified retirement plans.

If an entity treated as a partnership for U.S. federal income tax purposes holds GTx common stock, the tax treatment of a partner in the partnership will depend on the status of the partner, the activities of the partnership and certain determinations made at the partner level. Accordingly, partnerships holding GTx common stock and the partners in such partnerships should consult their tax advisors regarding the U.S. federal income tax consequences to them.

THIS DISCUSSION IS FOR INFORMATION PURPOSES ONLY AND IS NOT TAX ADVICE. HOLDERS SHOULD CONSULT THEIR TAX ADVISORS WITH RESPECT TO THE APPLICATION OF THE U.S. FEDERAL INCOME TAX LAWS TO THEIR PARTICULAR SITUATIONS AS WELL AS ANY TAX CONSEQUENCES OF THE RECEIPT OF CVRs ARISING UNDER THE U.S. FEDERAL ESTATE OR GIFT TAX LAWS OR UNDER THE LAWS OF ANY STATE, LOCAL OR NON-U.S. TAXING JURISDICTION OR UNDER ANY APPLICABLE INCOME TAX TREATY.

For purposes of this discussion, a GTx U.S. Holder is a beneficial owner of GTx common stock that, for U.S. federal income tax purposes, is or is treated as:

- an individual who is a citizen or resident of the United States;
- a corporation created or organized under the laws of the United States, any state thereof, or the District of Columbia;
- an estate, the income of which is subject to U.S. federal income tax regardless of its source; or
- a trust that (i) is subject to the primary supervision of a U.S. court and the control of one or more "United States persons" (within the meaning of Section 7701(a)(30) of the Code) over all of its substantial decisions or (ii) has a valid election in effect to be treated as a United States person for U.S. federal income tax purposes.

Receipt of CVRs by GTx U.S. Holders

Although the matter is not free from doubt, GTx intends to treat the receipt of CVRs and the GTx Reverse Stock Split as separate transactions for U.S. federal income tax purposes, and the following discussion assumes this treatment will be respected.

There is no authority directly addressing whether contingent value rights with characteristics similar to the CVRs should be treated as a distribution of property with respect to the corporation's stock, a distribution of equity, a "debt instrument" or an "open transaction" for U.S. federal income tax purposes. Under applicable U.S. tax principles such questions are inherently factual in nature. Based on the specific characteristics of the CVRs, GTx intends to report the issuance of the CVRs as a distribution of property with respect to its stock. GTx U.S. Holders are urged to consult their tax advisors regarding the tax consequences to them of the receipt of CVRs.

Specifically, GTx intends to report the issuance of the CVRs to GTx U.S. Holders as a distribution of property with respect to its stock, because the CVRs will be issued to all holders of GTx common stock prior to completion of the merger. Each GTx U.S. Holder will be treated as receiving a distribution in an amount equal to the fair market value of the CVRs issued to such GTx U.S. Holder on the date of the issuance. This distribution generally should be treated first as a taxable dividend to the extent of the GTx U.S. Holder's pro rata share of GTx's current or accumulated earnings and profits (as determined for U.S. federal income tax purposes), then as a non-taxable return of capital to the extent of the GTx U.S. Holder's basis in its GTx common stock, and finally as capital gain from the sale or exchange of GTx common stock with respect to any remaining value. GTx currently has negative accumulated earnings and profits and expects no or a small amount of current earnings and profits for the relevant taxable year. Thus, GTx expects most or all of this distribution to be treated as other than a dividend for U.S. federal income tax purposes. GTx U.S. Holders will receive a Form 1099-DIV notifying them of the portion of the CVR value that is treated as a dividend for U.S. federal income tax purposes. A GTx U.S. Holder's initial tax basis in such holder's CVRs should equal the fair market value of such CVRs on the date of their issuance. The holding period of such CVRs should begin on the day after the date of issuance.

As a result of the above treatment, future payments received by a GTx U.S. Holder on a CVR would likely be treated as a non-taxable return of such GTx U.S. Holder's adjusted tax basis in the CVR to the extent thereof, and payments in excess of such amount would likely be treated as ordinary income.

However, the treatment of such future payments is uncertain and alternative treatments are possible, although not expected. One such possible treatment is that the CVRs could be treated as one or more "debt instruments." If that were to be the case, then payments received with respect to the CVRs generally would likely treated as payments in retirement of a "debt instrument," except to the extent interest is imputed under the Code. If those rules were to apply, interest generally should be imputed under complex rules. In such a case, a GTx U.S. Holder would be required to include any such interest in income on an annual basis, whether or not currently paid.

It is possible, although GTx believes unlikely, that the issuance of the CVRs could be treated as a distribution of equity for U.S. federal income tax purposes, in which case GTx U.S. Holders should not recognize gain or loss as a result of the issuance of the CVRs. Depending on the fair market value of the CVRs on the date of their issuance, each GTx U.S. Holder's tax basis in such holder's GTx common stock would be allocated between such holder's GTx common stock and such holder's CVRs. The holding period of such CVRs should include the GTx U.S. Holder's holding period of such holder's GTx common stock. Future payments on a CVR received by a GTx U.S. Holder would likely be treated as dividends to the extent of the GTx U.S. Holder's pro rata share of GTx's current or accumulated earnings and profits (as determined for U.S. federal income tax purposes), then as a non-taxable return of capital to the extent of the GTx U.S. Holder's basis in the CVR, and finally as capital gain from the sale or exchange of the CVR with respect to any remaining value. As discussed above, GTx does not intend to report the issuance of the CVRs as a distribution of equity and any GTx U.S. Holder reporting the CVR issuance as a distribution of equity likely faces an increased chance of being audited by the IRS with respect to such reporting.

It is possible, although again GTx believes unlikely, that the issuance of the CVRs could be treated as subject to the "open transaction" doctrine if the value of the CVRs on the closing date cannot be "reasonably ascertained." If the receipt of CVRs were treated as an "open transaction" for U.S. federal income tax purposes, each GTx U.S. Holder should not immediately take the CVRs into account in determining whether such holder

must recognize gain, if any, on the receipt of the CVRs and such holder would take no tax basis in the CVRs. Rather, the GTx U.S. Holder's U.S. federal income tax consequences would be determined in line with the discussion above based on whether the CVRs are treated as a distribution of property or of equity at the time the payments with respect to the CVRs are received or deemed received in accordance with the GTx U.S. Holder's regular method of accounting. As discussed above, GTx does not intend to report the issuance of the CVRs as an open transaction and any GTx U.S. Holder reporting the CVR issuance as an open transaction likely faces an increased chance of being audited by the IRS with respect to such reporting.

The CVRs should generally be treated as capital assets for U.S. federal income tax purposes once issued.

Alternative Treatment of the Receipt of CVRs and the GTx Reverse Stock Split as a Single Recapitalization

Notwithstanding GTx's position that the receipt of CVRs and the GTx Reverse Stock Split are appropriately treated as separate transactions, it is possible that the IRS or a court could determine that the receipt of the CVRs and the GTx Reverse Stock Split constitute a single "recapitalization" for U.S. federal income tax purposes. In such case, the tax consequences of the receipt of CVRs and the GTx Reverse Stock Split would differ from those described above and would depend in part on many of the same considerations described above, including whether the CVRs should be treated as property, equity or debt instruments or should be subject to the "open transaction" doctrine. In general, if the CVRs are treated as property and are not subject to the "open transaction" doctrine, then a GTx U.S. Holder should recognize gain (but not loss) equal to the lesser of (i) the fair market value of the CVRs received, and (ii) the excess (if any) of (A) the sum of (1) the fair market value of the CVRs received and (2) the fair market value of the GTx shares received in the GTx Reverse Stock Split (treating fractional shares as received for this purpose), over (B) the GTx U.S. Holder's adjusted tax basis in the GTx common stock surrendered in the GTx Reverse Stock Split.

PLEASE CONSULT YOUR TAX ADVISOR WITH RESPECT TO THE PROPER CHARACTERIZATION OF THE RECEIPT OF THE CVRs.

Voting Agreements and Written Consent

In order to induce GTx to enter into the Merger Agreement, certain stockholders of Oncternal are parties to a voting agreement with Oncternal and GTx pursuant to which, among other things, each stockholder has agreed, solely in its capacity as a stockholder of Oncternal, to vote all of its shares of Oncternal's capital stock in favor of (1) the adoption and approval of the Merger Agreement and the transactions contemplated thereby, (2) acknowledgement that the approval given for the Merger Agreement and is irrevocable and that the stockholder is aware of its appraisal rights under the DGCL, (3) acknowledgement that the stockholder is not entitled to appraisal rights by voting in favor of the transaction and waiving appraisal rights under the DGCL, and (3) the conversion of each share of Oncternal preferred stock into Oncternal common stock. Additionally, each stockholder has agreed, solely in its capacity as a stockholder of Oncternal, to vote against any competing acquisition proposal and any action, proposal or transaction that would reasonably be expected to result in a material breach of the voting agreement. These stockholders of Oncternal have also granted an irrevocable proxy to Oncternal and its designee to vote their respective Oncternal's capital stock in accordance with the voting agreements. Oncternal's stockholders may vote their shares of Oncternal capital stock on all other matters not referred to in such proxy.

The Oncternal stockholders who are parties to these voting agreements include all directors, executive officers and certain stockholders, including entities related to MagnaSci Ventures, which represents 10.4% of the outstanding shares of Oncternal capital stock on as converted common stock basis. SPH USA which holds 100% of the outstanding Series C preferred stock and which represents 20.9% of the outstanding shares of Oncternal capital stock on as converted common stock basis, has not executed a voting agreement. Although Oncternal expects to receive stockholder approval from SPH USA approximately two months after the date of the Merger Agreement, there can be no assurance that all of the necessary stockholder approvals will be obtained

The stockholders of Oncternal that are party to a voting agreement with GTx held, as of March 31, 2019:

- an aggregate of 32,059,203 shares of Oncternal's common stock and 38,883,369 shares of Oncternal preferred stock, representing approximately 43.7% of the outstanding shares of Oncternal capital stock on an as converted to common stock basis;
- an aggregate of 38,883,369 shares of Oncternal's preferred stock, representing approximately 35.0% of the outstanding Oncternal preferred stock, considered as a single class;
- an aggregate of 5,960,000 shares of Oncternal's Series A Preferred Stock, representing approximately 44.0% of the outstanding Series A Preferred Stock; and
- an aggregate of 32,923,369 shares of Oncternal's Series B Preferred Stock and Series B-2 Preferred Stock, representing approximately 51.9% of the outstanding Series B Preferred Stock and Series B-2 Preferred Stock, considered as a single class.

Following the effectiveness of the registration statement of which this proxy statement/prospectus/information statement is a part and pursuant to the Merger Agreement, these stockholders will execute written consents providing for such adoption and approval.

Under these voting agreements, subject to certain exceptions, such stockholders have also agreed not to sell or transfer shares of Oncternal's capital stock and securities held by them, or any voting rights with respect thereto, until the earlier of the termination of the Merger Agreement or the completion of the merger. To the extent that any such sale or transfer is permitted pursuant to the exceptions included in the voting agreement, each person to which any shares of Oncternal's capital stock or securities are so sold or transferred must agree in writing to be bound by the terms and provisions of the voting agreement, subject to certain further exceptions.

In addition, in order to induce Oncternal to enter into the Merger Agreement, certain of GTx's stockholders have entered into voting agreements with GTx and Oncternal pursuant to which, among other things, each such stockholder has agreed, solely in his, her or its capacity as a stockholder of GTx, to vote all of his, her or its shares of GTx's common stock in favor of Proposal Nos. 1, 2, 3, 4 and 5. Additionally, each such stockholder has agreed, solely in his, her or its capacity as a stockholder of GTx, to vote against any competing acquisition proposal and any action, proposal or transaction that would reasonably be expected to result in a material breach of the voting agreement. These stockholders of GTx have also granted GTx and its designee an irrevocable proxy to vote their respective shares in accordance with the voting agreements. GTx's stockholders may vote their shares of GTx's common stock on all other matters not referred to in such proxy.

The GTx stockholders who are parties to these voting agreements are:

- Robert J. Wills, Ph.D.
- Marc S. Hanover
- J.R. Hyde, III
- Michael G. Carter, M.D., Ch.B., F.R.C.P
- J. Kenneth Glass
- Garry A. Neil, M.D.
- Kenneth S. Robinson, M.D., M.Div.
- Henry P. Doggrell
- Jason Shackelford
- Pyramid Peak Foundation

As of March 31, 2019, the stockholders of GTx that are party to a voting agreement (including affiliated entities) owned an aggregate of 10,938,824 shares of GTx's common stock representing approximately 45% of the outstanding shares of GTx's common stock.

Under these voting agreements, subject to certain exceptions, such stockholders also have agreed not to sell or transfer their shares of GTx's common stock and securities held by them until the earlier of the termination of the Merger Agreement or the completion of the merger. To the extent that any such sale or transfer is permitted pursuant to the exceptions included in the voting agreements, each person to which any shares of GTx's common stock or securities are so sold or transferred must agree in writing to be bound by the terms and provisions of the voting agreement, subject to certain further exceptions.

Lock-up Agreements

As a condition to the closing of the merger, certain stockholders of each of GTx and Oncternal and their affiliates, have entered into lock-up agreements, pursuant to which such parties have agreed not to, except in limited circumstances, offer, pledge, sell, contract to sell, transfer or dispose of, directly or indirectly, engage in swap or similar transactions with respect to, or make any demand for or exercise any right with respect to, any shares of GTx's common stock or any security convertible into or exercisable or exchangeable for GTx's common stock, including, as applicable, shares received in the merger and issuable upon exercise of certain warrants and options, during the period commencing at the Effective Time and continuing until the date that is 180 days from the Effective Time.

Each of the stockholders who is party to a GTx voting agreement, as identified above, is a party to a lock-up agreement. As of March 31, 2019, GTx's stockholders who have executed lock-up agreements beneficially owned in the aggregate approximately 45% of the outstanding common stock of GTx.

Each of the stockholders who is party to an Oncternal voting agreement is a party to a lock-up agreement. Oncternal's stockholders who have executed lock-up agreements, as of March 31, 2019, beneficially owned in the aggregate approximately 44% of the outstanding shares of Oncternal's capital stock on an as converted to common stock basis. SPH USA, the holder of the largest amount of Oncternal capital stock, has not executed a lock-up agreement, but Oncternal expects it to execute a lock-up agreement prior to the closing of the merger, which is a condition to closing.

MATTERS BEING SUBMITTED TO A VOTE OF GTX'S STOCKHOLDERS

Proposal No. 1: Approval of the Merger Agreement, the Merger, the Issuance of Common Stock in the Merger and the Change of Control Resulting from the Merger

At the GTx special meeting, GTx's stockholders will be asked to approve the Merger Agreement and the transactions contemplated thereby, including the merger, the issuance of GTx's common stock to Oncternal's stockholders pursuant to the Merger Agreement and the change of control resulting from the merger. Immediately following the merger, it is expected that Oncternal's current stockholders will own approximately 75% of the outstanding common stock of GTx and current GTx stockholders with GTx's current stockholders will own approximately 25% of the outstanding common stock of GTx. The ownership percentage to be held by GTx's stockholders is subject to adjustment prior to closing of the merger, including a downward adjustment to the extent that GTx's "Parent Cash Amount" (as defined in the Merger Agreement) at the Effective Time is less than the threshold provided in the Merger Agreement, which adjusts based on the date of closing (and as a result, GTx stockholders could own less, and Oncternal stockholders could own more, of the combined organization), an upward adjustment to the extent that GTx's Parent Cash Amount at the Effective Time is greater than the threshold provided in the Merger Agreement, which adjusts based on the date of closing (and as a result, GTx stockholders could own more, and Oncternal stockholders could own less, of the combined organization), or an upward adjustment to the extent that Oncternal's "Company Cash Amount" (as defined in the Merger Agreement) at the Effective Time is less than $10,500,000 (and as a result, GTx stockholders could own more, and Oncternal stockholders could own less, of the combined organization).

The terms of, reasons for and other aspects of the Merger Agreement, the merger, the issuance of GTx's common stock pursuant to the Merger Agreement and the change of control resulting from the merger are described in detail in the other sections in this proxy statement/prospectus/information statement.

Required Vote

The affirmative vote of the holders of a majority of the shares of GTx's common stock entitled to vote and present in person or represented by proxy at the GTx special meeting is required for approval of Proposal No. 1. Abstentions will have the same effect as votes "AGAINST" this Proposal.

THE GTX BOARD RECOMMENDS THAT GTX'S STOCKHOLDERS VOTE "FOR" PROPOSAL NO. 1 TO APPROVE THE MERGER AGREEMENT AND THE TRANSACTIONS CONTEMPLATED THEREBY, INCLUDING THE MERGER, THE ISSUANCE OF GTX'S COMMON STOCK PURSUANT TO THE MERGER AGREEMENT AND THE CHANGE OF CONTROL RESULTING FROM THE MERGER. EACH OF PROPOSAL NOS. 1 AND 2 ARE CONDITIONED UPON EACH OTHER AND THE APPROVAL OF EACH SUCH PROPOSAL IS REQUIRED TO CONSUMMATE THE MERGER.

Proposal No. 2: Approval of an Amendment to the Restated Certificate of Incorporation of GTx Effecting the GTx Reverse Stock Split

General

At the GTx special meeting, GTx's stockholders will be asked to approve an amendment to the restated certificate of incorporation of GTx effecting the GTx Reverse Stock Split. Upon the effectiveness of the amendment to the restated certificate of incorporation of GTx effecting the GTx Reverse Stock Split, or the split effective time, the issued shares of GTx's common stock immediately prior to the split effective time will be reclassified into a smaller number of shares within a range, as determined by the GTx Board, such that a stockholder of GTx will own one new share of GTx's common stock for every to (or any number in between) shares of issued common stock held by that stockholder immediately prior to the split effective time.

If Proposal No. 2 is approved, the GTx Reverse Stock Split would become effective in connection with the closing of the merger. The GTx Board may effect only one reverse stock split in connection with this Proposal No. 2. The GTx Board's decision will be based on a number of factors, including market conditions, existing and expected trading prices for GTx's common stock and the listing requirements of Nasdaq.

The form of the amendment to the restated certificate of incorporation of GTx to effect the GTx Reverse Stock Split, as more fully described below, will effect the GTx Reverse Stock Split but will not change the number of authorized shares of common stock or preferred stock, or the par value of GTx's common stock or preferred stock.

Purpose

The GTx Board approved the proposal approving the amendment to the restated certificate of incorporation of GTx effecting the GTx Reverse Stock Split for the following reasons:

- the GTx Board believes effecting the GTx Reverse Stock Split may be an effective means of avoiding a delisting of GTx's common stock from Nasdaq in the future;
- the GTx Board believes that the GTx Reverse Stock Split will result in a number of authorized but unissued shares of GTx's common stock sufficient for the issuance of shares of GTx's common stock to Oncternal's stockholders pursuant to the Merger Agreement; and
- the GTx Board believes a higher stock price may help generate investor interest in GTx and help GTx attract and retain employees.

If the GTx Reverse Stock Split successfully increases the per share price of GTx's common stock, the GTx Board believes this increase may increase trading volume in GTx's common stock and facilitate future financings by GTx.

Nasdaq Requirements for Listing on Nasdaq

GTx's common stock is quoted on Nasdaq under the symbol "GTXI." GTx intends to file an initial listing application with Nasdaq to seek listing on Nasdaq upon the closing of the merger.

According to Nasdaq rules, an issuer must, in a case such as this, apply for initial inclusion following a transaction whereby the issuer combines with a non-Nasdaq entity, resulting in a change of control of the issuer and potentially allowing the non-Nasdaq entity to obtain a Nasdaq listing. Accordingly, the listing standards of Nasdaq will require GTx to have, among other things, a $4.00 per share minimum bid price upon the closing of the merger. Therefore, the GTx Reverse Stock Split may be necessary in order to consummate the merger.

One of the effects of the GTx Reverse Stock Split will be to effectively increase the proportion of authorized shares which are unissued relative to those which are issued. This could result in GTx's management being able to issue more shares without further stockholder approval. For example, before the GTx Reverse Stock Split, GTx's authorized but unissued shares immediately prior to the closing of the merger would be approximately 35.9 million compared to shares issued of approximately 24.1 million. If GTx effects the GTx Reverse Stock Split using a 1: ratio (the midpoint of the range of the GTx Reverse Stock Split), its authorized but unissued shares immediately prior to the closing of the merger would be approximately million compared to shares issued of approximately million. GTx currently has no plans to issue shares, other than in connection with the merger, and to satisfy obligations under the GTx warrants and employee stock options from time to time as these warrants and options are exercised. The GTx Reverse Stock Split will not affect the number of authorized shares of GTx's common stock which will continue to be authorized pursuant to the certificate of incorporation of GTx.

Potential Increased Investor Interest

On April 4, 2019, GTx's common stock closed at $1.31 per share. An investment in GTx's common stock may not appeal to brokerage firms that are reluctant to recommend lower priced securities to their clients. Investors may also be dissuaded from purchasing lower priced stocks because the brokerage commissions, as a percentage of the total transaction, tend to be higher for such stocks. Moreover, the analysts at many brokerage firms do not monitor the trading activity or otherwise provide coverage of lower priced stocks. Also, the GTx Board believes that most investment funds are reluctant to invest in lower priced stocks.

There are risks associated with the GTx Reverse Stock Split, including that the GTx Reverse Stock Split may not result in an increase in the per share price of GTx's common stock.

GTx cannot predict whether the GTx Reverse Stock Split will increase the market price for GTx's common stock. The history of similar stock split combinations for companies in like circumstances is varied. There is no assurance that:

- the market price per share of GTx's common stock after the GTx Reverse Stock Split will rise in proportion to the reduction in the number of shares of GTx's common stock outstanding before the GTx Reverse Stock Split;
- the GTx Reverse Stock Split will result in a per share price that will attract brokers and investors who do not trade in lower priced stocks;
- the GTx Reverse Stock Split will result in a per share price that will increase the ability of GTx to attract and retain employees; or
- the market price per share will either exceed or remain in excess of the $1.00 minimum bid price as required by the Nasdaq Stock Market LLC for continued listing, or that GTx will otherwise meet the requirements of the Nasdaq Stock Market LLC for inclusion for trading on Nasdaq, including the $4.00 minimum bid price upon the closing of the merger.

The market price of GTx's common stock will also be based on performance of GTx and other factors, some of which are unrelated to the number of shares outstanding. If the GTx Reverse Stock Split is effected and the market price of GTx's common stock declines, the percentage decline as an absolute number and as a percentage of the overall market capitalization of GTx may be greater than would occur in the absence of a reverse stock split. Furthermore, the liquidity of GTx's common stock could be adversely affected by the reduced number of shares that would be outstanding after the GTx Reverse Stock Split.

Principal Effects of the GTx Reverse Stock Split

The amendment to the restated certificate of incorporation of GTx effecting the GTx Reverse Stock Split is set forth in *Annex D* to this proxy statement/prospectus/information statement.

The GTx Reverse Stock Split will be effected simultaneously for all outstanding shares of GTx's common stock. The GTx Reverse Stock Split will affect all of GTx's stockholders uniformly and will not affect any stockholder's percentage ownership interest in GTx, except to the extent that the GTx Reverse Stock Split results in any of GTx's stockholders owning a fractional share. Shares of GTx's common stock issued pursuant to the GTx Reverse Stock Split will remain fully paid and nonassessable. The GTx Reverse Stock Split does not affect the total proportionate ownership of GTx following the merger. The GTx Reverse Stock Split will not affect GTx continuing to be subject to the periodic reporting requirements of the Exchange Act.

Procedure for Effecting the GTx Reverse Stock Split and Exchange of Stock Certificates

If GTx's stockholders approve the amendment to the restated certificate of incorporation of GTx effecting the GTx Reverse Stock Split, and if the GTx Board still believes that a reverse stock split is in the best interests of

GTx and its stockholders, GTx will file the amendment to the restated certificate of incorporation with the Secretary of State of the State of Delaware at such time as the GTx Board has determined to be the appropriate split effective time. The GTx Board may delay effecting the GTx Reverse Stock Split without resoliciting stockholder approval. Beginning at the split effective time, each certificate representing pre-split shares will be deemed for all corporate purposes to evidence ownership of post-split shares.

As soon as practicable after the split effective time, GTx's stockholders will be notified that the GTx Reverse Stock Split has been effected. GTx expects that the GTx transfer agent will act as exchange agent for purposes of implementing the exchange of stock certificates. Holders of pre-split shares will be asked to surrender to the exchange agent certificates representing pre-split shares held in certificated form in exchange for certificates representing post-split shares in accordance with the procedures to be set forth in a letter of transmittal to be sent by GTx. In the event that the GTx Name Change under Proposal No. 3 is approved by GTx's stockholders, the certificates reflecting the post-split shares will also reflect the GTx Name Change. No new certificates will be issued to a stockholder until such stockholder has surrendered such stockholder's outstanding certificate(s) together with the properly completed and executed letter of transmittal to the exchange agent. Any pre-split shares submitted for transfer, whether pursuant to a sale or other disposition, or otherwise, will automatically be exchanged for post-split shares. **Stockholders should not destroy any stock certificate(s) and should not submit any certificate(s) unless and until requested to do so.**

Fractional Shares

No fractional shares will be issued in connection with the GTx Reverse Stock Split. Stockholders of record who otherwise would be entitled to receive fractional shares because they hold a number of pre-split shares not evenly divisible by the number of pre-split shares for which each post-split share is to be reclassified, will be entitled, upon surrender to the exchange agent of certificates representing such shares, to a cash payment in lieu thereof at a price equal to the fraction to which the stockholder would otherwise be entitled multiplied by the closing price of the common stock on Nasdaq on the date immediately preceding the split effective time. The ownership of a fractional interest will not give the holder thereof any voting, dividend, or other rights except to receive payment therefor as described herein.

By approving the amendment to the restated certificate of incorporation of GTx effecting the GTx Reverse Stock Split, stockholders will be approving the combination of to shares of GTx's common stock, as determined by the GTx Board, into one share of GTx's common stock.

Stockholders should be aware that, under the escheat laws of the various jurisdictions where stockholders reside, where GTx is domiciled, and where the funds will be deposited, sums due for fractional interests that are not timely claimed after the effective date of the split may be required to be paid to the designated agent for each such jurisdiction, unless correspondence has been received by GTx or the exchange agent concerning ownership of such funds within the time permitted in such jurisdiction. Thereafter, stockholders otherwise entitled to receive such funds will have to seek to obtain them directly from the state to which they were paid.

Potential Anti-Takeover Effect

Although the increased proportion of unissued authorized shares to issued shares could, under certain circumstances, have an anti-takeover effect, for example, by permitting issuances that would dilute the stock ownership of a person seeking to effect a change in the composition of The GTx Board or contemplating a tender offer or other transaction for the combination of GTx with another company, the GTx Reverse Stock Split proposal is not being proposed in response to any effort of which GTx is aware to accumulate shares of GTx's common stock or obtain control of GTx, other than in connection with the merger, nor is it part of a plan by management to recommend a series of similar amendments to The GTx Board and stockholders. Other than the proposals being submitted to GTx's stockholders for their consideration at the GTx special meeting, the GTx Board does not currently contemplate recommending the adoption of any other actions that could be construed to

affect the ability of third parties to take over or change control of GTx. For more information, please see the section entitled "Risk Factors—Risks Related to the Common Stock of GTx", and "Description of GTx's Capital Stock—Anti-Takeover Effects of Provisions of GTx Charter Documents" and "—Anti-Takeover Effects of Delaware Law."

Material U.S. Federal Income Tax Consequences of the GTx Reverse Stock Split

The following discussion is a summary of the material U.S. federal income tax consequences of the GTx Reverse Stock Split to GTx U.S. Holders (which, for purposes of this discussion, has the same meaning as in "Agreements Related to the Merger—CVR Agreement—Material U.S. Federal Income Tax Consequences of the Receipt of CVRs"), but does not purport to be a complete analysis of all potential tax consequences that may be relevant to GTx U.S. Holders. The effects of other U.S. federal tax laws, such as estate and gift tax laws, and any applicable state, local or non-U.S. tax laws are not discussed. This discussion is based on the Code, Treasury Regulations promulgated thereunder, judicial decisions, and published rulings and administrative pronouncements of the IRS, in each case in effect as of the date hereof. These authorities may change or be subject to differing interpretations. Any such change or differing interpretation may be applied retroactively in a manner that could adversely affect a GTx U.S. Holder. GTx has not sought and does not intend to seek any rulings from the IRS regarding the matters discussed below. There can be no assurance the IRS or a court will not take a position contrary to that discussed below regarding the tax consequences of the GTx Reverse Stock Split.

This discussion is limited to GTx U.S. Holders that hold GTx common stock as a "capital asset" within the meaning of Section 1221 of the Code (generally, property held for investment). This discussion does not address all U.S. federal income tax consequences that may be relevant to a GTx U.S. Holder's particular circumstances, including the impact of the alternative minimum tax or the Medicare contribution tax on net investment income. In addition, it does not address consequences relevant to GTx U.S. Holders subject to special rules, including, without limitation:

- U.S. expatriates and former citizens or long-term residents of the United States;
- GTx U.S. Holders whose functional currency is not the U.S. dollar;
- persons holding GTx common stock as part of a hedge, straddle or other risk reduction strategy or as part of a conversion transaction or other integrated investment;
- banks, insurance companies, and other financial institutions;
- real estate investment trusts or regulated investment companies;
- brokers, dealers or traders in securities;
- persons for whom GTx common stock constitutes "qualified small business stock" within the meaning of Section 1202 of the Code;
- "controlled foreign corporations," "passive foreign investment companies," and corporations that accumulate earnings to avoid U.S. federal income tax;
- S corporations, partnerships or other entities or arrangements treated as partnerships for U.S. federal income tax purposes (and investors therein);
- tax-exempt organizations or governmental organizations;
- persons subject to special tax accounting rules as a result of any item of gross income with respect to GTx common stock being taken into account in an "applicable financial statement" (as defined in the Code);
- persons deemed to sell GTx common stock under the constructive sale provisions of the Code;
- persons who hold or received GTx common stock pursuant to the exercise of any employee stock option or otherwise as compensation; and
- tax-qualified retirement plans.

If an entity treated as a partnership for U.S. federal income tax purposes holds GTx common stock, the tax treatment of a partner in the partnership will depend on the status of the partner, the activities of the partnership and certain determinations made at the partner level. Accordingly, partnerships holding GTx common stock and the partners in such partnerships should consult their tax advisors regarding the U.S. federal income tax consequences to them.

THIS DISCUSSION IS FOR INFORMATION PURPOSES ONLY AND IS NOT TAX ADVICE. HOLDERS SHOULD CONSULT THEIR TAX ADVISORS WITH RESPECT TO THE APPLICATION OF THE U.S. FEDERAL INCOME TAX LAWS TO THEIR PARTICULAR SITUATIONS AS WELL AS ANY TAX CONSEQUENCES OF THE GTX REVERSE STOCK SPLIT ARISING UNDER THE U.S. FEDERAL ESTATE OR GIFT TAX LAWS OR UNDER THE LAWS OF ANY STATE, LOCAL OR NON-U.S. TAXING JURISDICTION OR UNDER ANY APPLICABLE INCOME TAX TREATY.

GTx Reverse Stock Split

The GTx Reverse Stock Split should constitute a "recapitalization" for U.S. federal income tax purposes. As a result, a GTx U.S. Holder generally should not recognize gain or loss upon the GTx Reverse Stock Split, except with respect to cash received in lieu of a fractional share of GTx common stock, as discussed below. A GTx U.S. Holder's aggregate tax basis in the shares of GTx common stock received pursuant to the GTx Reverse Stock Split should equal the aggregate tax basis of the shares of GTx common stock surrendered (excluding any portion of such basis that is allocated to any fractional share of GTx common stock), and such GTx U.S. Holder's holding period in the shares of GTx common stock received should include the holding period in the shares of GTx common stock surrendered. Treasury Regulations provide detailed rules for allocating the tax basis and holding period of the shares of GTx common stock surrendered to the shares of GTx common stock received pursuant to the GTx Reverse Stock Split. Holders of shares of GTx common stock acquired on different dates and at different prices should consult their tax advisors regarding the allocation of the tax basis and holding period of such shares.

A GTx U.S. Holder that receives cash in lieu of a fractional share of GTx common stock pursuant to the GTx Reverse Stock Split should recognize capital gain or loss in an amount equal to the difference between the amount of cash received and the GTx U.S. Holder's tax basis in the shares of GTx common stock surrendered that is allocated to such fractional share of our common stock. Such capital gain or loss should be long-term capital gain or loss if the GTx U.S. Holder's holding period for GTx common stock surrendered exceeded one year at the effective time of the GTx Reverse Stock Split.

Although GTx intends to treat the GTx Reverse Stock Split and the receipt of CVRs as separate transactions, it is possible that the IRS or a court could determine that the GTx Reverse Stock Split and the receipt of CVRs constitute a single "recapitalization" for U.S. federal income tax purposes. For a discussion of such treatment, please see the section entitled "Agreements Related to the Merger—CVR Agreement—Material U.S. Federal Income Tax Consequences of the Receipt of CVRs—Alternative Treatment of the Receipt of CVRs and the GTx Reverse Stock Split as a Single Recapitalization."

Information Reporting and Backup Withholding

A GTx U.S. Holder may be subject to information reporting and backup withholding when such holder receives cash in lieu of fractional shares of GTx common stock in the GTx Reverse Stock Split. Certain GTx U.S. Holders are exempt from backup withholding, including corporations and certain tax-exempt organizations. A GTx U.S. Holder will be subject to backup withholding if such holder is not otherwise exempt and:

- the holder fails to furnish the holder's taxpayer identification number, which for an individual is ordinarily his or her social security number;
- the holder furnishes an incorrect taxpayer identification number;

- the applicable withholding agent is notified by the IRS that the holder previously failed to properly report payments of interest or dividends; or
- the holder fails to certify under penalties of perjury that the holder has furnished a correct taxpayer identification number and that the IRS has not notified the holder that the holder is subject to backup withholding.

Backup withholding is not an additional tax. Any amounts withheld under the backup withholding rules may be allowed as a refund or a credit against a GTx U.S. Holder's U.S. federal income tax liability, provided the required information is timely furnished to the IRS. GTx U.S. Holders should consult their tax advisors regarding their qualification for an exemption from backup withholding and the procedures for obtaining such an exemption.

Vote Required; Recommendation of Board of Directors

The affirmative vote of holders of a majority of the shares of GTx's common stock having voting power outstanding on the record date for the GTx special meeting is required to approve the amendment to the restated certificate of incorporation of GTx effecting the GTx Reverse Stock Split. Abstentions and broker non-votes will have the same effect as votes "AGAINST" this Proposal.

THE GTX BOARD RECOMMENDS THAT GTX'S STOCKHOLDERS VOTE "FOR" PROPOSAL NO. 2 TO APPROVE THE AMENDMENT TO THE RESTATED CERTIFICATE OF INCORPORATION OF GTX EFFECTING THE GTX REVERSE STOCK SPLIT. EACH OF PROPOSAL NOS. 1 AND 2 ARE CONDITIONED UPON EACH OTHER AND THE APPROVAL OF EACH SUCH PROPOSAL IS REQUIRED TO CONSUMMATE THE MERGER.

Proposal No. 3: Approval of GTx Name Change

At the GTx special meeting, GTx's stockholders will be asked to approve the amendment to the restated certificate of incorporation of GTx to effect the GTx Name Change. The primary reason for the corporate name change is that management believes this will allow for brand recognition of Oncternal's products and programs following the consummation of the merger. GTx's management believes that the current name will no longer accurately reflect the business of GTx and the mission of GTx subsequent to the consummation of the merger.

The affirmative vote of holders of a majority of the shares of GTx's common stock having voting power outstanding on the record date for the GTx special meeting is required to approve the amendment to the restated certificate of incorporation to effect the GTx Name Change. Abstentions and broker non-votes will have the same effect as votes "AGAINST" this Proposal.

THE GTX BOARD RECOMMENDS THAT GTX'S STOCKHOLDERS VOTE "FOR" PROPOSAL NO. 3 TO APPROVE THE GTX NAME CHANGE. PROPOSAL NO. 3 IS CONDITIONED UPON THE APPROVAL OF EACH OF PROPOSAL NOS. 1 AND 2.

Proposal No. 4: Approval of the Adoption of the GTx, Inc. 2019 Incentive Award Plan

Overview

In this Proposal No. 4, GTx is requesting GTx stockholders to approve and adopt the GTx, Inc. 2019 Incentive Award Plan (the "GTx 2019 Plan") and the material terms thereunder. The GTx Board intends to approve the GTx 2019 Plan prior to the GTx special meeting, subject to stockholder approval at the GTx special meeting. The GTx 2019 Plan will become effective on the day prior to the closing date of the merger, subject to consummation of the merger, provided stockholder approval has been obtained prior to such date.

The GTx 2019 Plan is described in more detail below. A copy of the GTx 2019 Plan is attached to this proxy statement as *Annex F*.

All share numbers in this Proposal 4 do not reflect the GTx Reverse Stock Split which will be applied to the share numbers in the GTx 2019 Plan.

The GTx 2019 Plan

The purpose of the GTx 2019 Plan is to enhance GTx's ability to attract, retain and motivate persons who make (or are expected to make) important contributions to GTx by providing these individuals with equity ownership opportunities. GTx believes that the GTx 2019 Plan is essential to its success. Equity awards are intended to motivate high levels of performance and align the interests of GTx's directors, employees and consultants with those of GTx's stockholders by giving directors, employees and consultants the perspective of an owner with an equity stake in GTx and providing a means of recognizing their contributions to the success of GTx. The GTx Board and management believe that equity awards are necessary to remain competitive in its industry and are essential to recruiting and retaining the highly qualified employees who help GTx meet its goals.

Equity Incentive Awards Are Critical to Long-Term Stockholder Value Creation

The table below presents information about the number of shares that were subject to outstanding equity awards under GTx's equity incentive plans and the shares remaining available for issuance under the such plan, each at March 31, 2019, and the proposed share reserve under the GTx 2019 Plan. The GTx, Inc. 2013 Equity Incentive Plan (as amended) (the "GTx 2013 Plan") and the GTx, Inc. 2001 Stock Option Plan, the GTx, Inc. 2002 Stock Option Plan, the GTx, Inc. 2004 Equity Incentive Plan, the GTx, Inc. Amended and Restated 2004 Non-Employee Directors' Stock Option Plan, the GTx, Inc. 2013 Non-Employee Director Equity Incentive Plan (the "GTx Directors Plan"), 2018 Amended and Restated Directors' Deferred Compensation Plan (the "GTx Director Deferred Compensation Plan") are the only equity incentive plans GTx currently has in place and awards may only be granted pursuant to the GTx 2013 Plan, the GTx Directors Plan and the GTx Director Deferred Compensation Plan. None of the following share numbers give effect to the GTx Reverse Stock Split or the merger.

	Number of Shares #	As of a % of Shares Outstanding(1)	Dollar Value $(2)
GTx 2001 Stock Option Plan			
Options outstanding	450	0.002%	$ 540.00
Weighted-average exercise price of outstanding options	$ 42.00		
Weighted-average remaining term of outstanding options	0.75 years		
Shares remaining available for grant under the GTx 2001 Stock Option Plan	—	— %	$ —
GTx 2002 Stock Option Plan			
Options outstanding	3,118	0.013%	$ 3,741.60
Weighted-average exercise price of outstanding options	$35.80		
Weighted-average remaining term of outstanding options	2.23 years		
Shares remaining available for grant under the GTx 2002 Stock Option Plan	—	— %	$ —
GTx 2004 Equity Incentive Plan			
Options outstanding	198,429	0.825%	$ 238,114.80
Weighted-average exercise price of outstanding options	$ 36.98		
Weighted-average remaining term of outstanding options	1.68 years		
Shares remaining available for grant under the GTx 2004 Equity Incentive Plan	—	— %	$ —
GTx Amended and Restated 2004 Non-Employee Directors' Stock Option Plan			
Options outstanding	15,000	0.062%	$ 18,000.00
Weighted-average exercise price of outstanding options	$ 50.88		
Weighted-average remaining term of outstanding options	1.79 years		
Shares remaining available for grant under the GTx Amended and Restated 2004 Non-Employee Directors' Stock Option Plan	—	— %	$ —
GTx 2013 Plan			
Options outstanding	1,948,400	8.101%	$2,338,080.00
Weighted-average exercise price of outstanding options	$ 8.76		
Weighted-average remaining term of outstanding options	5.90 years		
Shares remaining available for grant under the GTx 2013 Plan	1,979,921	8.232%	$2,375,905.20
GTx Director Deferred Compensation Plan			
Deferred stock rights outstanding	155,426	0.646%	$ 186,511.20
Shares remaining available for grant under the GTx Director Deferred Compensation Plan	—	— %	$ —
GTx Directors Plan			
Options outstanding	153,250	0.637%	$ 1,8390.00
Weighted-average exercise price of outstanding options	$ 9.96		
Weighted-average remaining term of outstanding options	7.49 years		
Shares remaining available for grant under the GTx Directors Plan	216,115	0.899%	$ 259,338.00
GTx 2019 Plan			
Proposed shares available for issuance under the GTx 2019 Plan(3)		%	$

(1) Based on 24,051,844 shares of GTx common stock outstanding as of March 31, 2019.
(2) Based on the closing price of GTx common stock on March 29, 2019, of $1.20 per share.
(3) Does not include (a) possible future increases to the share reserve under the evergreen provision of the GTx 2019 Plan. Pursuant to the evergreen provision, the GTx 2019 Plan will be subject to an annual increase on the first day of each calendar year beginning January 1, 2020 and ending on and including January 1, 2029, equal to the lesser of (i) 5% of the aggregate number of shares outstanding on the final day of the immediately preceding calendar year and (ii) such smaller number of shares as is determined by the board of GTx, or (b) any shares subject to awards under the GTx 2013 Plan as of the effective date of the GTx 2019 Plan that become available for issuance under the GTx 2019 Plan (which number is added to the overall share limit under the GTx 2019 Plan).

In determining whether to approve the GTx 2019 Plan, including the proposed share reserve under the GTx 2019 Plan, the GTx Board will consider, among other things, the following:

- The purpose of the share reserve under the GTx 2019 Plan is to provide the combined organization with appropriate capacity to issue equity compensation following the closing of the merger. Assuming the GTx 2019 Plan is approved, and after giving effect to the GTx Reverse Stock Split and the merger, the requested increase to the share reserve is expected to represent approximately 12% of the outstanding GTx common stock immediately following the merger.
- In determining the size of the share reserve under the GTx 2019 Plan, the GTx Board will consider the substantial changes to the capitalization structure of GTx that will occur as a result of the GTx Reverse Stock Split and the merger, which will have the effect of significantly diminishing the remaining share reserve under GTx's existing equity plans. In calendar years 2018, 2017 and 2016, GTx's annual equity burn rates (calculated by dividing the number of shares subject to equity awards granted during the year by the weighted-average number of shares outstanding during the applicable year) under GTx's equity plans were 2.0%, 5.6% and 2.6%, respectively.
- GTx expects the proposed aggregate share reserve under the GTx 2019 Plan to provide GTx with enough shares for awards for at least five years, assuming GTx continues to grant awards consistent with GTx's current practices and historical usage, as reflected in its historical burn rate, assuming GTx receives the maximum annual evergreen increases under the GTx 2019 Plan during its ten-year term, and further dependent on the price of GTx shares and hiring activity during the next few years, forfeitures of outstanding awards, and noting that the consummation of the merger and future circumstances may require GTx to change its current equity grant practices. GTx cannot predict its future equity grant practices, the future price of GTx shares or future hiring activity with any degree of certainty at this time, and the share reserve under the GTx 2019 Plan could last for a shorter or longer time.
- In fiscal years 2018, 2017 and 2016, GTx's end of year overhang rate (calculated by dividing (1) the sum of the number of shares subject to equity awards outstanding at the end of the calendar year plus shares remaining available for issuance for future awards at the end of the calendar year by (2) the number of shares outstanding at the end of the calendar year) was 14.6%, 13.6% and 14.9%, respectively.
- If the GTx 2019 Plan is approved, the merger is consummated and the GTx Reverse Stock Split is implemented, GTx expects the combined organization's overhang at the end of 2019 will be approximately %.
- Following the closing of the merger, the GTx 2019 Plan will be the only plan under which GTx will be able to grant new equity awards.

In light of the factors described above, and the fact that the ability to continue to grant equity compensation is vital to GTx's ability to continue to attract and retain employees in the extremely competitive labor markets in which it competes, the GTx Board plans to approve a share reserve under the GTx 2019 Plan that is reasonable and appropriate at this time. The GTx Board will not create a subcommittee to evaluate the risk and benefits for issuing shares under the GTx 2019 Plan.

Summary of the GTx 2019 Plan

This section summarizes certain principal features of the GTx 2019 Plan. The summary is qualified in its entirety by reference to the complete text of the GTx 2019 Plan, which is attached to this proxy statement as *Annex F*.

Eligibility and Administration

GTx's employees, consultants and directors, and employees and consultants of GTx's subsidiaries, will be eligible to receive awards under the GTx 2019 Plan. As of March 31, 2019, GTx had 13 employees and five non-employee directors. Following the closing of the merger, the combined company is expected to have approximately employees, eight non-employee directors and other service providers who will be eligible to receive awards under the GTx 2019 Plan.

The GTx 2019 Plan will be administered by the GTx Board, which may delegate its duties and responsibilities to one or more committees of GTx's directors and/or officers (referred to collectively as the plan administrator), subject to the limitations imposed under the GTx 2019 Plan, Section 16 of the Exchange Act, stock exchange rules and other applicable laws. The plan administrator will have the authority to take all actions and make all determinations under the GTx 2019 Plan, to interpret the GTx 2019 Plan and award agreements and to adopt, amend and repeal rules for the administration of the GTx 2019 Plan as it deems advisable. The plan administrator will also have the authority to determine which eligible service providers receive awards, grant awards and set the terms and conditions of all awards under the GTx 2019 Plan, including any vesting and vesting acceleration provisions, subject to the conditions and limitations in the GTx 2019 Plan.

Shares Available for Awards

The sum of (a) shares of common stock of GTx; (b) any shares of common stock of GTx which are subject to awards under the GTx 2013 Plan as of the effective date of the GTx 2019 Plan which become available for issuance under the GTx 2019 Plan (which number added to the overall share limit pursuant to this clause (b) shall not exceed shares of common stock of GTx); and (c) an annual increase on the first day of each calendar year beginning January 1, 2020 and ending on and including January 1, 2029, equal to the lesser of (i) 5% of the aggregate number of Shares outstanding on the final day of the immediately preceding calendar year and (ii) such smaller number of shares of common stock of GTx as is determined by the GTx Board, will be available for issuance under the GTx 2019 Plan. Shares issued under the GTx 2019 Plan may be authorized but unissued shares, shares purchased on the open market or treasury shares. Notwithstanding anything to the contrary in the GTx 2019 Plan, no more than shares of common stock of GTx may be issued pursuant to the exercise of incentive stock options ("ISOs") under the GTx 2019 Plan. Upon the effectiveness of the GTx 2019 Plan, no further awards will be granted under the GTx 2013 Plan or the GTx Directors Plan. In addition, the GTx Director Deferred Compensation Plan will be terminated at the time of the closing of the merger.

If an award under the GTx 2019 Plan or the GTx 2013 Plan expires, lapses or is terminated, exchanged for cash, surrendered, repurchased, canceled without having been fully exercised or forfeited, any unused shares subject to the award will again be available for new grants under the GTx 2019 Plan. Further, shares delivered to satisfy the purchase price or tax withholding obligation for any award or award under the GTx 2013 Plan will again be available for new grants under the GTx 2019 Plan.

Awards granted under the GTx 2019 Plan in substitution for any options or other stock or stock-based awards granted by an entity before the entity's merger or consolidation with GTx (or any of GTx's subsidiaries) or GTx's (or any of GTx's subsidiary's) acquisition of the entity's property or stock will not reduce the shares available for grant under the GTx 2019 Plan, but will count against the maximum number of shares that may be issued upon the exercise of incentive stock options.

Awards

The GTx 2019 Plan provides for the grant of stock options, including ISOs and nonqualified stock options ("NSOs"), stock appreciation rights ("SARs"), restricted stock, dividend equivalents, restricted stock units ("RSUs") and other stock or cash based awards. Certain awards under the GTx 2019 Plan may constitute or provide for payment of "nonqualified deferred compensation" under Section 409A of the Code. All awards under the GTx 2019 Plan will be set forth in award agreements, which will detail the terms and conditions of awards, including any applicable vesting and payment terms and post-termination exercise limitations. A brief description of each award type follows.

- *Stock Options and SARs.* Stock options provide for the purchase of shares of common stock of GTx in the future at an exercise price set on the grant date. ISOs, in contrast to NSOs, may provide tax deferral beyond exercise and favorable capital gains tax treatment to their holders if certain holding period and other requirements of the Code are satisfied. SARs entitle their holder, upon exercise, to receive from us an amount equal to the appreciation of the shares subject to the award between the grant date and the exercise date. The plan administrator will determine the number of shares covered by each option and SAR, the exercise price of each option and SAR and the conditions and limitations applicable to the exercise of each option and SAR. The exercise price of a stock option or SAR will not be less than 100% of the fair market value of the underlying share on the grant date (or 110% in the case of ISOs granted to certain significant stockholders), except with respect to certain substitute awards granted in connection with a corporate transaction. The term of a stock option or SAR may not be longer than ten years (or five years in the case of ISOs granted to certain significant stockholders). The closing share price per share of GTx common stock on Nasdaq on March 29, 2019 was $1.20.
- *Restricted Stock.* Restricted stock is an award of nontransferable shares of common stock of GTx that remain forfeitable unless and until specified conditions are met and which may be subject to a purchase price. Upon issuance of restricted stock, recipients generally have the rights of a stockholder with respect to such shares, which generally include the right to receive dividends and other distributions in relation to the award. The terms and conditions applicable to restricted stock will be determined by the plan administrator, subject to the conditions and limitations contained in the GTx 2019 Plan.
- *RSUs.* RSUs are contractual promises to deliver shares of common stock of GTx in the future, which may also remain forfeitable unless and until specified conditions are met and may be accompanied by the right to receive the equivalent value of dividends paid on shares of common stock of GTx prior to the delivery of the underlying shares (i.e., dividend equivalent rights). The plan administrator may provide that the delivery of the shares underlying RSUs will be deferred on a mandatory basis or at the election of the participant. The terms and conditions applicable to RSUs will be determined by the plan administrator, subject to the conditions and limitations contained in the GTx 2019 Plan.
- *Other Stock or Cash Based Awards.* Other stock or cash based awards are awards of cash, fully vested shares of common stock of GTx and other awards valued wholly or partially by referring to, or otherwise based on, shares of common stock of GTx or other property. Other stock or cash based awards may be granted to participants and may also be available as a payment form in the settlement of other awards, as standalone payments and as payment in lieu of compensation to which a participant is otherwise entitled. The plan administrator will determine the terms and conditions of other stock or cash based awards, which may include any purchase price, performance goal, transfer restrictions and vesting conditions.

Certain Transactions

In connection with certain corporate transactions and events affecting the common stock of GTx, including a change in control, or change in any applicable laws or accounting principles, the plan administrator has broad discretion to take action under the GTx 2019 Plan to prevent the dilution or enlargement of intended benefits, facilitate the transaction or event or give effect to the change in applicable laws or accounting principles. This

includes canceling awards for cash or property, accelerating the vesting of awards, providing for the assumption or substitution of awards by a successor entity, adjusting the number and type of shares subject to outstanding awards and/or with respect to which awards may be granted under the GTx 2019 Plan and replacing or terminating awards under the GTx 2019 Plan. In addition, in the event of certain non-reciprocal transactions with GTx's stockholders, the plan administrator will make equitable adjustments to the GTx 2019 Plan and outstanding awards as it deems appropriate to reflect the transaction. In the event of change in control, if awards are not continued, converted, assumed, or replaced with a substantially similar award by GTx or a successor entity or its parent or subsidiary, then, immediately prior to the change in control, and contingent on a participant's then-current employment with GTx, such awards shall become fully vested, exercisable and/or payable, as applicable, and all forfeiture, repurchase and other restrictions on such awards shall lapse, in which case, such awards shall be canceled upon the consummation of the change in control in exchange for the right to receive the change in control consideration payable to other holders of common stock.

Provisions of the GTx 2019 Plan Relating to Director Compensation

The GTx 2019 Plan provides that the plan administrator may establish compensation for non-employee directors from time to time subject to the GTx 2019 Plan's limitations. The plan administrator will from time to time determine the terms, conditions and amounts of all non-employee director compensation in its discretion and pursuant to the exercise of its business judgment, taking into account such factors, circumstances and considerations as it shall deem relevant from time to time, provided that, the sum of any cash compensation or other compensation and the grant date fair value of any equity awards granted under the GTx 2019 Plan as compensation for services as a non-employee director during any fiscal year may not exceed $0.75 million (increased to $1.0 million in the fiscal year of a non-employee director's initial service as a non-employee director). The plan administrator may make exceptions to this limit for individual non-employee directors in extraordinary circumstances, as the plan administrator may determine in its discretion, subject to the limitations in the GTx 2019 Plan.

Plan Amendment and Termination

The GTx Board may amend or terminate the GTx 2019 Plan at any time; however, no amendment, other than an amendment that increases the number of shares available under the GTx 2019 Plan, may materially and adversely affect an award outstanding under the GTx 2019 Plan without the consent of the affected participant and stockholder approval will be obtained for any amendment to the extent necessary to comply with applicable laws. The GTx 2019 Plan will remain in effect until the tenth anniversary of the date the GTx Board adopted the GTx 2019 Plan, unless earlier terminated by the GTx Board. No awards may be granted under the GTx 2019 Plan after its termination. Under the GTx 2019 Plan, the plan administrator may, without the approval of our stockholders, authorize the repricing of any outstanding option or SAR to reduce its price per share, or cancel any option or SAR in exchange for cash or another award when the price per share exceeds the Fair Market Value (as that term is defined in the GTx 2019 Plan) of the underlying shares.

Foreign Participants, Claw-back Provisions, Transferability and Participant Payments

The plan administrator may modify awards granted to participants who are foreign nationals or employed outside the United States or establish subplans or procedures to address differences in laws, rules, regulations or customs of such foreign jurisdictions. All awards will be subject to any company claw-back policy as set forth in such claw-back policy or the applicable award agreement. Except as the plan administrator may determine or provide in an award agreement, awards under the GTx 2019 Plan are generally non-transferrable, except by will or the laws of descent and distribution, or, subject to the plan administrator's consent, pursuant to a domestic relations order, and are generally exercisable only by the participant. With regard to tax withholding obligations arising in connection with awards under the GTx 2019 Plan, and exercise price obligations arising in connection with the exercise of stock options under the GTx 2019 Plan, the plan administrator may, in its discretion, accept cash, wire transfer or check, shares of common stock of GTx that meet specified conditions, a promissory note, a

"market sell order," such other consideration as the plan administrator deems suitable or any combination of the foregoing.

Securities Laws

The GTx 2019 Plan is intended to conform to all provisions of the Securities Act of 1933, as amended, and the Exchange Act, and any and all regulations and rules promulgated by the Securities and Exchange Commission thereunder, including without limitation Rule 16b-3. The GTx 2019 Plan will be administered, and options will be granted and may be exercised, only in such a manner as to conform to such laws, rules and regulations.

Material U.S. Federal Income Tax Consequences

The following summary is based on an analysis of the Code as currently in effect, existing laws, judicial decisions, administrative rulings, regulations and proposed regulations, all of which are subject to change. Moreover, the following is only a summary of United States federal income tax consequences. Actual tax consequences to participants may be either more or less favorable than those described below depending on the participant's particular circumstances.

ISO. No income will be recognized by a participant for federal income tax purposes upon the grant or exercise of an ISO. The basis of shares transferred to a participant upon exercise of an ISO is the price paid for the shares. If the participant holds the shares for at least one year after the transfer of the shares to the participant and two years after the grant of the option, the participant will recognize capital gain or loss upon sale of the shares received upon exercise equal to the difference between the amount realized on the sale and the basis of the stock. Generally, if the shares are not held for that period, the participant will recognize ordinary income upon disposition in an amount equal to the excess of the fair market value of the shares on the date of exercise over the amount paid for the shares, or if less, the gain on disposition. Any additional gain realized by the participant upon the disposition will be a capital gain. The excess of the fair market value of shares received upon the exercise of an ISO over the option price for the shares is generally an item of adjustment for the participant for purposes of the alternative minimum tax. Therefore, although no income is recognized upon exercise of an ISO, a participant may be subject to alternative minimum tax as a result of the exercise.

NSOs. No income is expected to be recognized by a participant for federal income tax purposes upon the grant of an NSO. Upon exercise of an NSO, the participant will recognize ordinary income in an amount equal to the excess of the fair market value of the shares on the date of exercise over the amount paid for the shares. Income recognized upon the exercise of an NSO will be considered compensation subject to withholding at the time the income is recognized, and, therefore, the participant's employer must make the necessary arrangements with the participant to ensure that the amount of the tax required to be withheld is available for payment. NSOs are designed to provide the employer with a deduction equal to the amount of ordinary income recognized by the participant at the time of the recognition by the participant, subject to the deduction limitations described below.

SARs. There is expected to be no federal income tax consequences to either the participant or the employer upon the grant of SARs. Generally, the participant will recognize ordinary income subject to withholding upon the receipt of payment pursuant to SARs in an amount equal to the aggregate amount of cash and the fair market value of any common stock received. Subject to the deduction limitations described below, the employer generally will be entitled to a corresponding tax deduction equal to the amount includible in the participant's income.

Restricted Stock. If the restrictions on an award of shares of restricted stock are of a nature that the shares are both subject to a substantial risk of forfeiture and are not freely transferable (within the meaning of Section 83 of the Code), the participant will not recognize income for federal income tax purposes at the time of the award unless the participant affirmatively elects to include the fair market value of the shares of restricted stock on the date of the award, less any amount paid for the shares, in gross income for the year of the award pursuant to

Section 83(b) of the Code. In the absence of this election, the participant will be required to include in income for federal income tax purposes on the date the shares either become freely transferable or are no longer subject to a substantial risk of forfeiture (within the meaning of Section 83 of the Code), the fair market value of the shares of restricted stock on such date, less any amount paid for the shares. The employer will be entitled to a deduction at the time of income recognition to the participant in an amount equal to the amount the participant is required to include in income with respect to the shares, subject to the deduction limitations described below. If a Section 83(b) election is made within 30 days after the date the restricted stock is received, the participant will recognize ordinary income at the time of the receipt of the restricted stock, and the employer will be entitled to a corresponding deduction, equal to the fair market value of the shares at the time, less the amount paid, if any, by the participant for the restricted stock. If a Section 83(b) election is made, no additional income will be recognized by the participant upon the lapse of restrictions on the restricted stock, but, if the restricted stock is subsequently forfeited, the participant may not deduct the income that was recognized pursuant to the Section 83(b) election at the time of the receipt of the restricted stock.

Dividends paid to a participant holding restricted stock before the expiration of the restriction period will be additional compensation taxable as ordinary income to the participant subject to withholding, unless the participant made an election under Section 83(b). Subject to the deduction limitations described below, the employer generally will be entitled to a corresponding tax deduction equal to the dividends includible in the participant's income as compensation. If the participant has made a Section 83(b) election, the dividends will be dividend income, rather than additional compensation, to the participant.

If the restrictions on an award of restricted stock are not of a nature that the shares are both subject to a substantial risk of forfeiture and not freely transferable, within the meaning of Section 83 of the Code, the participant will recognize ordinary income for federal income tax purposes at the time of the transfer of the shares in an amount equal to the fair market value of the shares of restricted stock on the date of the transfer, less any amount paid therefore. The employer will be entitled to a deduction at that time in an amount equal to the amount the participant is required to include in income with respect to the shares, subject to the deduction limitations described below.

RSUs. There will be no federal income tax consequences to either the participant or the employer upon the grant of RSUs. Generally, the participant will recognize ordinary income subject to withholding upon the receipt of cash and/or transfer of shares of common stock in payment of the RSUs in an amount equal to the aggregate of the cash received and the fair market value of the common stock so transferred. Subject to the deduction limitations described below, the employer generally will be entitled to a corresponding tax deduction equal to the amount includible in the participant's income.

Generally, a participant will recognize ordinary income subject to withholding upon the payment of any dividend equivalents paid with respect to an award in an amount equal to the cash the participant receives. Subject to the deduction limitations described below, the employer generally will be entitled to a corresponding tax deduction equal to the amount includible in the participant's income.

Excess Parachute Payments. Section 280G of the Code limits the deduction that the employer may take for otherwise deductible compensation payable to certain individuals if the compensation constitutes an "excess parachute payment." Excess parachute payments arise from payments made to disqualified individuals that are in the nature of compensation and are contingent on changes in ownership or control of the employer or certain affiliates. Accelerated vesting or payment of awards under the GTx 2019 Plan upon a change in ownership or control of the employer or its affiliates could result in excess parachute payments. In addition to the deduction limitation applicable to the employer, a disqualified individual receiving an excess parachute payment is subject to a 20% excise tax on the amount thereof.

Application of Section 409A of the Code. Section 409A of the Code imposes an additional 20% tax and interest on an individual receiving non-qualified deferred compensation under a plan that fails to satisfy certain

requirements. For purposes of Section 409A, "non-qualified deferred compensation" includes equity-based incentive programs, including some stock options, SARs and RSU programs. Generally speaking, Section 409A does not apply to ISOs, non-discounted NSOs and appreciation rights if no deferral is provided beyond exercise, or restricted stock.

The awards made pursuant to the GTx 2019 Plan are expected to be designed in a manner intended to comply with the requirements of Section 409A of the Code to the extent the awards granted under the GTx 2019 Plan are not exempt from coverage. However, if the GTx 2019 Plan fails to comply with Section 409A in operation, a participant could be subject to the additional taxes and interest.

State and local tax consequences may in some cases differ from the federal tax consequences. The foregoing summary of the income tax consequences in respect of the GTx 2019 Plan is for general information only. Interested parties should consult their own advisors as to specific tax consequences of their awards. The GTx 2019 Plan is not subject to the Employee Retirement Income Security Act of 1974, as amended, and is not intended to be qualified under Section 401(a) of the Code.

Plan Benefits

The benefits or amounts that may be received or allocated to participants under the GTx 2019 Plan will be determined at the discretion of the plan administrator and are not currently determinable. GTx expects to continue to make automatic equity awards under the GTx 2019 Plan to GTx's non-employee directors. GTx's current director compensation program will be suspended at the time of the closing of the merger and the director compensation policies for the combined organization following the merger will be re-evaluated by the compensation committee and board of directors of the combined organization following completion of the merger and may be subject to change. Non-employee directors of the combined organization are, however, expected to receive annual cash retainers and equity compensation, although the amount of such compensation has not yet been determined.

Vote Required for Approval

The affirmative vote of holders of a majority of the shares of GTx's common stock having voting power outstanding on the record date for the GTx special meeting is required to approve the GTx 2019 Plan Proposal. Abstentions will have the same effect as votes "AGAINST" this proposal.

THE GTX BOARD RECOMMENDS THAT GTX'S STOCKHOLDERS VOTE "FOR" PROPOSAL NO. 4 TO APPROVE THE GTX 2019 PLAN PROPOSAL. PROPOSAL NO. 4 IS CONDITIONED UPON THE APPROVAL OF EACH OF PROPOSAL NOS. 1 AND 2.

Proposal No. 5: Advisory Vote on Merger Related Compensation

Section 14A of the Exchange Act and Rule 14a-21(c) under the Exchange Act require that GTx seek a nonbinding advisory vote from its stockholders to approve the compensation that will be paid or may become payable to GTx's named executive officers in connection with the merger. For further information, see the section entitled "The Merger—Interests of GTx Directors and Executive Officers in the Merger—GTx Named Executive Officer Golden Parachute Compensation" beginning on page 153 of this proxy statement/prospectus/information statement. As required by these provisions, GTx is asking its stockholders to vote on the adoption of the following resolution:

> "RESOLVED, that the compensation that will be paid or may become payable to GTx's named executive officers in connection with the merger, as disclosed in the table entitled " GTx Named Executive Officer Golden Parachute Compensation" pursuant to Item 402(t) of Regulation S-K, including the associated narrative discussion, and the agreements or understandings pursuant to which such compensation will be paid or may become payable, are hereby APPROVED."

As this vote is advisory, it will not be binding upon The GTx Board or compensation committee and neither the board of directors nor the compensation committee will be required to take any action as a result of the outcome of this vote. Approval of this proposal is not a condition to completion of the merger. The vote with respect to this proposal is an advisory vote and will not be binding on GTx or Oncternal. Therefore, regardless of whether GTx stockholders approve this proposal, if the merger is approved by the stockholders and completed, the merger-related compensation will still be paid to such named executive officers to the extent payable in accordance with the terms of such compensation contracts and arrangements.

Required Vote

The affirmative vote of the holders of a majority of the shares of GTx's common stock having entitled to vote and present in person or represented by proxy at the GTx special meeting is required to approve the proposal to approve, on a non-binding, advisory basis, the "GTx named Executive Officer Golden Parachute Compensation." Abstentions will have the same effect as votes "AGAINST" this Proposal.

THE GTX BOARD RECOMMENDS A VOTE "FOR" THIS PROPOSAL NO. 5 TO APPROVE, ON A NON-BINDING, ADVISORY BASIS, THE "GTX NAMED EXECUTIVE OFFICER GOLDEN PARACHUTE COMPENSATION."

Proposal No. 6: Approval of Possible Adjournment of the GTx special meeting

If GTx fails to receive a sufficient number of votes to approve Proposal Nos. 1 or 2, GTx may propose to adjourn the GTx special meeting, for a period of not more than 30 days, for the purpose of soliciting additional proxies to approve Proposal Nos. 1 or 2. GTx currently does not intend to propose adjournment at the GTx special meeting if there are sufficient votes to approve Proposal Nos. 1 or 2. The affirmative vote of the holders of a majority of the shares of GTx's common stock having entitled to vote and present in person or represented by proxy at the GTx special meeting is required to approve the adjournment of the GTx special meeting for the purpose of soliciting additional proxies to approve Proposal Nos. 1 or 2. Abstentions will have the same effect as votes "AGAINST" this Proposal.

THE GTX BOARD RECOMMENDS THAT GTX'S STOCKHOLDERS VOTE "FOR" PROPOSAL NO. 6 TO ADJOURN THE GTX SPECIAL MEETING, IF NECESSARY, TO SOLICIT ADDITIONAL PROXIES IF THERE ARE NOT SUFFICIENT VOTES IN FAVOR OF PROPOSAL NOS. 1 OR 2. EACH OF PROPOSAL 1 AND 2 ARE CONDITIONED UPON EACH OTHER AND THE APPROVAL OF EACH SUCH PROPOSAL IS REQUIRED TO CONSUMMATE THE MERGER.

GTX BUSINESS

Overview

GTx is a biopharmaceutical company dedicated to the discovery, development and commercialization of medicines to treat serious and/or significant unmet medical conditions. Under an exclusive worldwide license agreement with the University of Tennessee Research Foundation, or UTRF, GTx is developing UTRF's proprietary selective androgen receptor degrader, or SARD, technology, which it believes has the potential to provide compounds that can degrade or antagonize multiple forms of androgen receptor, or AR, thereby potentially inhibiting tumor growth in patients with progressive castration-resistant prostate cancer, or CRPC, including those patients who do not respond to or are resistant to current androgen targeted therapies. GTx is in the process of completing ongoing preclinical studies in order to select the most appropriate SARD compounds to move forward into the additional preclinical studies required to submit an investigational new drug application, or IND, and potentially advance one of its SARD compounds into a first-in-human clinical trial.

GTx had been developing selective androgen receptor modulators, or SARMs. GTx's SARM product candidate, enobosarm (GTx-024), was most recently evaluated in post-menopausal women with stress urinary incontinence, or SUI. During the third quarter of 2018, GTx announced that the ASTRID trial, evaluating the change in the mean number of daily SUI episodes following 12 weeks of enobosarm treatment failed to achieve statistical significance on the primary endpoint of the proportion of patients with a greater than 50% reduction in incontinence episodes per day compared to placebo. GTx has completed the ASTRID trial, including its review of the full data sets from the clinical trial, and has determined that there is not a sufficient path forward to warrant additional clinical development of enobosarm to treat SUI. GTx has therefore discontinued further development of enobosarm to treat SUI, including discontinuing the related durability and open-label safety extension studies GTx initiated before it received topline data from the ASTRID trial. GTx has also discontinued any further development of its SARM program generally.

Following the announcement of the ASTRID trial results, the GTx Board commenced a process of evaluating strategic alternatives to maximize stockholder value. To assist with this process, the GTx Board engaged a financial advisory firm to help explore its available strategic alternatives, including possible mergers and business combinations, a sale of part or all of its assets, and collaboration and licensing arrangements as further discussed in the section titled "The Merger–Background of the Merger." On March 6, 2019, GTx and Oncternal announced the signing of the Merger Agreement. Although GTx has entered into the Merger Agreement and intends to consummate the merger, there is no assurance that it will be able to successfully consummate the merger on a timely basis, or at all. If, for any reason, the merger is not completed, GTx will reconsider its strategic alternatives and could pursue one or more of the following courses of action:

- ***Continue development of GTx's SARD program.*** As set forth above, GTx is in the process of completing ongoing preclinical studies in order to select the most appropriate SARD compounds to move forward into the additional preclinical studies required to submit an IND and potentially advance one of its SARD compounds into a first-in-human clinical trial. Accordingly, if, for any reason, the merger is not consummated, GTx may determine to move forward with its planned IND-enabling studies of its SARD compounds. However, while GTx believes that its existing capital resources will be adequate to enable it to conduct and complete planned IND-enabling preclinical studies of its SARD compounds, GTx will require significant additional financial resources in order to initiate and complete initial human clinical trials of a SARD compound and to otherwise further the development of its SARD program.

  As a result, GTx may also resume its efforts to seek additional funds through potential collaborative, partnering or other strategic arrangements to provide it with the necessary resources for the development of GTx's SARD program.

- ***Pursue potential collaborative, partnering or other strategic arrangements for GTx's SARM assets, including a sale or other divestiture of its SARM assets***. GTx has discontinued further development

of its SARM program, including enobosarm, and do not currently have any plans to resume development of its SARM program. GTx continues its efforts to seek potential collaborative, partnering or other strategic arrangements for its SARM assets, including a sale or other divestiture of its SARM assets.

- ***Pursue another strategic transaction like the merger.*** The GTx Board may elect to pursue an alternative strategy, one of which may be a strategic transaction similar to the merger.
- ***Dissolve and liquidate GTx's assets.*** If, for any reason, the merger is not consummated and GTx is unable to identify and complete an alternative strategic transaction like the merger or potential collaborative, partnering or other strategic arrangements for its SARM assets, or to continue to operate GTx's business due to its inability to raise additional funding for the development of its SARD program or otherwise, GTx may be required to dissolve and liquidate its assets. In such case, GTx would be required to pay all of its debts and contractual obligations, and to set aside certain reserves for potential future claims, and there can be no assurances as to the amount or timing of available cash left to distribute to its stockholders after paying its debts and other obligations and setting aside funds for reserves.

GTx's SARD Program

SARDs for the Potential Treatment of Castration Resistant Prostate Cancer

Scientific Overview. SARDs are a novel class of drugs. The AR is a major driver of prostate tumor cell proliferation, and blocking its activity is a therapeutic target. Despite the use of therapies designed to inhibit the AR pathway in men with advanced prostate cancer, a significant number of men have tumors that do not respond to such therapeutic approaches and/or become resistant to them. This lack of response may be due to the presence of forms of the AR (splice variants and mutated) for which these therapies are not effective. SARDs are designed to not only bind to androgen receptors, but also induce androgen receptor degradation and ultimately inhibit tumor cell growth. Selective AR degradation which targets the N-terminus may be an effective therapeutic strategy where a variant or mutated AR can be degraded by the SARD. This ability to circumvent common drug resistance in prostate cancer patients may provide an important tool for effective new treatments.

GTx believes SARDs have the potential to treat prostate cancer, as well as other diseases such as benign prostatic hyperplasia and Kennedy's disease. GTx envisions initially developing SARDs as a potentially novel treatment for men with CRPC, including those who do not respond or are resistant to currently approved therapies. Although current therapies have improved overall survival in men with CRPC, approximately one-third of the CRPC patients do not respond to these therapies, due in part to the presence of splice variants, including AR-V7, as well as mutations in the androgen receptor. Splice variants of the androgen receptor have been identified in which the ligand binding domain, the binding site for androgens and necessary for the action of many of the current therapies, is lost. In addition, most patients who initially respond to available treatments eventually progress due to the emergence of resistance to these therapies. It is believed that CRPC growth remains highly dependent on androgen receptor activity, although the mechanisms which underlie this resistance are not fully understood. GTx believes a therapeutic agent that would safely degrade multiple forms of the androgen receptor, including those without the ligand binding domain, would be uniquely positioned to address this patient population.

Potential Market. In the United States alone, GTx believes there are approximately 80,000 men who have developed resistance to luteinizing hormone-releasing hormone ("LHRH"), therapies and therefore have CRPC but who have not received chemotherapy. GTx believes there are approximately 36,000 men diagnosed each year with metastatic hormone sensitive prostate cancer. Zytiga® and XTANDI® are currently the only drugs approved for the treatment of metastatic CRPC in patients who have not yet received chemotherapy, although several other drugs are in clinical development for this indication. GTx believes new hormonal therapies in development, if approved, will be used prior to chemotherapy as physicians and patients look for treatment options capable of delaying cancer progression and possibly prolonging survival prior to chemotherapy.

Preclinical Development. GTx is in the process of completing ongoing preclinical studies in order to select the most appropriate SARD compounds to move forward into the additional preclinical studies required to submit an IND and potentially advance one of its SARD compounds into a first-in-human clinical trial. However, while GTx believes that its existing capital resources will be adequate to enable it to conduct and complete planned IND-enabling preclinical studies of its SARD compounds, GTx will require significant additional financial resources in order to initiate and complete initial human clinical trials of a SARD compound and to otherwise further the development of its SARD program. Accordingly, if, for any reason, the merger is not consummated, GTx may resume its efforts to seek additional funds through potential collaborative, partnering or other strategic arrangements to provide it with the necessary resources for the development of its SARD program.

SARMs

Evaluation of Enobosarm for the Treatment of Postmenopausal Women with SUI. In the third quarter of 2017, GTx initiated the ASTRID trial at over 60 clinical trial centers in the United States to evaluate the change in the mean number of daily SUI episodes following 12 weeks of enobosarm treatment. The ASTRID trial evaluated the safety and efficacy of enobosarm (1 mg and 3 mg) compared with placebo in post-menopausal women who have demonstrated SUI symptoms for more than six months, with an average of 3 to 15 reported SUI episodes per day over a three-day period, and a positive bladder stress test. The primary endpoint for the ASTRID trial was the percentage of patients with at least a 50 percent reduction in mean leaks per day at week 12, compared to baseline. During the third quarter of 2018, GTx announced that the ASTRID trial failed to achieve statistical significance on the primary endpoint of the proportion of patients with a greater than 50% reduction in incontinence episodes per day compared to placebo. The percentage of patients with a greater than 50% reduction after 12 weeks of enobosarm treatment was 58.9% for 3 mg, 57.7% for 1 mg and 52.7% for placebo. Enobosarm was generally safe and well tolerated, and reported adverse events were minimal and similar across all treatment groups. GTx has completed the ASTRID trial, including GTx's review of the full data sets from the clinical trial, and has determined that there is not a sufficient path forward to warrant additional clinical development of enobosarm to treat SUI. GTx has therefore discontinued further development of enobosarm to treat SUI, including discontinuing the related durability and open-label safety extension studies GTx initiated before it received topline data from the ASTRID trial.

Evaluation of Enobosarm for the Treatment of Breast Cancer. GTx has previously evaluated enobosarm in a Phase 2 clinical trial designed to evaluate the efficacy and safety of a 9 mg and 18 mg dose of enobosarm in patients whose advanced breast cancer is both estrogen receptor ("ER"), positive and AR positive. GTx announced in November 2016 that enobosarm achieved the pre-specified primary efficacy endpoint in the 9 mg dose cohort with 9 patients achieving a clinical benefit response ("CBR"), defined as a complete response, partial response, or stable disease, among the first 22 evaluable patients in that cohort. In November 2017, GTX announced that in the 9 mg cohort, a total of 14 patients achieved a CBR following 24 weeks of treatment. GTx also announced in November of 2017 that the 18 mg cohort achieved the pre-specified primary efficacy endpoint as 12 patients achieved a CBR at 24 weeks. Although both the 9 mg and 18 mg cohorts met the primary efficacy endpoint in the Phase 2 clinical trial, after evaluating the breast cancer environment where the treatment paradigms are shifting to immunotherapies and/or combination therapies, GTx decided in the third quarter of 2017 that the time and cost of conducting the necessary clinical trials for potential approval in this indication does not warrant further development of enobosarm in this indication. In 2015, GTx also commenced enrollment in a Phase 2 proof-of-concept clinical trial designed to evaluate the efficacy and safety of an 18 mg dose of enobosarm in patients with advanced AR positive triple-negative breast cancer ("TNBC"). This clinical trial was conducted utilizing a Simon's two-stage trial design whereby if at least 2 of the first 21 patients achieved clinical benefit, the trial was designed to enroll the second stage, which would result in enrolling 41 evaluable patients in the clinical trial. During the third quarter of 2017, GTx completed its review of the data from the first stage of the clinical trial. While GTx's review of the data did not raise any safety concerns, it did confirm that there were insufficient patients achieving clinical benefit from enobosarm treatment to continue this clinical trial and it closed the clinical trial down.

Discontinuation of SARM Development Efforts. Following GTx's review of the full data sets from the ASTRID trial, GTx discontinued further development of enobosarm to treat SUI and otherwise discontinued any further development of its SARM program. GTx continues its efforts to seek potential collaborative, partnering or other strategic arrangements for its SARM assets, including a sale or other divestiture of GTx's SARM assets. If the merger is completed, any net proceeds derived from the disposition or licensing of its SARM assets following completion of the merger will be made available to its stockholders in accordance with the CVR Agreement. GTx has for many years actively pursued, but has been unable to successfully enter into, potential collaborative, partnering or other strategic arrangements for its SARM assets. If it is unable to ultimately enter into any such arrangements for its SARM assets, GTx will not receive any return on its investment in enobosarm and its other SARMs.

Licenses and Collaborative Relationships

GTx has in the past established and, if the merger is not completed, it may continue to pursue, in-licenses and partnering, and collaborative or other strategic relationships with academic institutions and with other pharmaceutical and biotechnology companies.

In March 2015, GTx and UTRF entered into a license agreement (the "SARD License Agreement"), pursuant to which GTx was granted exclusive worldwide rights in all existing SARD technologies owned or controlled by UTRF, including all improvements thereto. Under the SARD License Agreement, GTx is obligated to employ active, diligent efforts to conduct preclinical research and development activities for the SARD program to advance one or more lead compounds into clinical development. GTx is also obligated to pay UTRF annual license maintenance fees, low single-digit royalties on net sales of products and additional royalties on sublicense revenues, depending on the state of development of a clinical product candidate at the time it is sublicensed. Unless terminated earlier, the term of the SARD License Agreement will continue, on a country-by-country basis, until the expiration of the last valid claim of any licensed patent in the particular country in which a licensed patent is granted. UTRF may terminate the SARD License Agreement for GTx's uncured breach or upon its bankruptcy.

In July 2007, GTx and UTRF also previously entered into a consolidated, amended and restated license agreement (the "SARM License Agreement"), to consolidate and replace GTx's two previously existing SARM license agreements with UTRF and to modify and expand certain rights and obligations of each of the parties under both license agreements. Pursuant to the SARM License Agreement, GTx was granted exclusive worldwide rights in all existing SARM technologies owned or controlled by UTRF, including enobosarm, and certain improvements thereto, and exclusive rights to certain future SARM technology that may be developed by certain scientists at the University of Tennessee or subsequently licensed to UTRF under certain existing inter-institutional agreements with The Ohio State University. Unless terminated earlier, the term of the SARM License Agreement will continue, on a country-by-country basis, for the longer of 20 years or until the expiration of the last valid claim of any licensed patent in the particular country in which a licensed product is being sold. UTRF may terminate the SARM License Agreement for GTx's uncured breach or upon its bankruptcy.

Under the SARM License Agreement, GTx paid UTRF a one-time, upfront fee of $290,000 as consideration for entering into the SARM License Agreement. GTx is also obligated to pay UTRF annual license maintenance fees, low single-digit royalties on net sales of products and mid-single-digit royalties on sublicense revenues. GTx also agreed to pay all expenses to file, prosecute and maintain the patents relating to the licensed SARM technologies, and is obligated to use commercially reasonable efforts to develop and commercialize products based on the licensed SARM technologies. While GTx currently has ceased development efforts for SARMs, it continues to seek potential collaborative, partnering or other strategic arrangements for its SARM assets, including a sale or other divestiture of its SARM assets. In December 2008, GTx and UTRF amended the SARM License Agreement (the "SARM License Amendment"), to, among other things, clarify the treatment of certain payments that GTx may receive from its current and future sublicensees for purposes of determining sublicense fees payable to UTRF, including the treatment of payments made to GTx in exchange for the sale of its securities

in connection with sublicensing arrangements. In consideration for the execution of the SARM License Amendment, GTx paid UTRF $494,000.

Manufacturing

GTx does not currently own or operate manufacturing facilities, and it relies, and expects to continue to rely, on third parties for the production of clinical and commercial quantities of any product candidates.

There are no complicated chemistries or unusual equipment required in the manufacturing process for either SARMs or SARDs. GTx relies and expects to continue to rely on third-party vendors for drug substance and drug product manufacturing, including drug substance for SARDs used in its current and potential future preclinical studies.

Competition

The biotechnology and biopharmaceutical industries are characterized by rapidly advancing technologies, intense competition and a strong emphasis on proprietary products. GTx faces competition from many different sources, including commercial pharmaceutical and biotechnology enterprises, academic institutions, government agencies and private and public research institutions.

Many of GTx's competitors have significantly greater financial resources and expertise in research and development, manufacturing, preclinical testing, conducting clinical trials, obtaining regulatory approvals and marketing approved products than GTx does. Smaller or early-stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large and established companies. GTx's commercial opportunities will be reduced or eliminated if its competitors develop and commercialize similar products that are safer, more effective, have fewer side effects or are less expensive than any products that it and/or its collaborators may develop.

SARDs for the Potential Treatment of CRPC

GTx has entered into an exclusive worldwide license agreement with UTRF to develop its proprietary SARD technology which GTx believes has the potential to provide compounds that can degrade or antagonize multiple forms of the AR thereby inhibiting tumor growth in patients with CRPC, including those patients who do not respond or are resistant to current therapies. Drugs in development having potentially similar approaches to removing the AR by degradation include Arvinas Inc.'s ARV-110, which is a chimera with an AR binding moiety on one end and an E3 ligase recruiting element on the other that has recently entered Phase 1 development for the treatment of advanced prostate cancer, and Androscience Corporation's androgen receptor degrader enhancer, ASC-J9, which is currently in development for acne and alopecia with the potential for development as a treatment for prostate cancer. Additionally, Essa Pharma Inc. recently completed a Phase 1 study with EPI-506, an AR antagonist that targets the N-terminal domain of the AR, and has plans to develop a second generation agent. C4 Therapeutics, Inc. is developing degronimids as means to degrade the AR through the ligand binding domain associated degradation. CellCentric is developing therapies that target the histone methyltransferase enzyme to lower AR levels, and recently initiated a clinical trial with CCS1477 in prostate cancer. Oric Pharmaceuticals is targeting the glucocorticoid receptor as a means to impact men that have CRPC, and has a lead candidate ORIC-101 in preclinical testing. In addition to this specific potential mechanistic competition, there are various products approved or under clinical development in the broader space of treating men with advanced prostate cancer who have metastatic CRPC which may compete with GTx's proposed initial clinical objective for GTx's SARD compounds. Pfizer and Astellas Pharma market XTANDI® (enzalutamide), an oral androgen receptor antagonist, for the treatment of metastatic CRPC in men previously treated with docetaxel as well as those that have not yet received chemotherapy. XTANDI® received FDA approval in July 2018 for the treatment of men with non-metastatic CRPC. Zytiga®, sold by Johnson & Johnson, has been approved for the treatment of metastatic CRPC and metastatic high-risk castration-sensitive prostate cancer.

Johnson & Johnson also received FDA approval for a second generation anti-androgen ERLEADA (apalutamide) for the treatment of men with non-metastatic castrate-resistant prostate cancer. Bayer HealthCare and Orion Corporation recently announced that the primary endpoint of increased metastatic free survival was met in a Phase 3 study of darolutamide (ODM-201) in men with CRPC without metastases and with a rising PSA. Another target in prostate cancer that is being pursued by several companies is bromodomain inhibition. Zenith Epigenetics, Gilead Sciences Inc., CellCentric, Incyte Corporation and GlaxoSmithKline are among the companies that are evaluating BET inhibitors in Phase 1-2 trials.

SARMs

With respect to SARMs, there are other SARM product candidates in development that may compete with enobosarm and any future SARM product candidates, if approved for commercial sale. For example, Viking Therapeutic's VK5211 recently reported positive results from a Phase 2 study for patients recovering from non-elective hip fracture surgery. Radius Health Inc.'s RAD140 is currently being evaluated in a Phase 1 study in postmenopausal women with hormone-receptor positive locally advanced or metastatic breast cancer. GlaxoSmithKline is conducting a Phase 1 study to assess the effect of GSK2881078 on physical strength and function after 13 weeks of treatment in patients with chronic obstructive pulmonary disease, or COPD, and muscle weakness. OPKO Health's OPK88004 is enrolling in a dose ranging study to improve symptoms of benign prostatic hyperplasia (BPH) by reducing prostate size and, on the basis of data from a previous trial in 350 men, increase muscle mass and bone strength and decrease body fat.

Intellectual Property

GTx will be able to protect its technology from unauthorized use by third parties only to the extent it is covered by valid and enforceable patents or is effectively maintained as trade secrets. Patents and other proprietary rights are an essential element of its business.

For its SARD compounds and methods of use thereof, GTx has filed certain patent applications in the United States, Canada, Mexico, Australia, Japan, China, and other countries in Asia and before the European Patent Office and is the exclusive licensee of worldwide rights for the SARD technology under a license agreement with UTRF executed in 2015. Thus far GTx has six issued patents and one is allowed, all in the United States. The patents and patent applications (if are issued) will expire between 2036 and 2039.

For enobosarm and its other SARM compounds, GTx has an exclusive license from UTRF under its issued patents and pending patent applications in the United States, Canada, Australia, Japan, China and other countries in Asia, before the European Patent Office designating Germany, Great Britain, Spain, France, Italy, and other European Union countries, as well as in certain other countries outside those regions, covering the composition of matter of the active pharmaceutical ingredient for pharmaceutical products, pharmaceutical compositions and methods of synthesizing the active pharmaceutical ingredients. GTx has also exclusively licensed from UTRF issued and pending patent applications in the United States, Canada, Australia, Japan, China and other countries in Asia, before the European Patent Office designating Germany, Great Britain, Spain, France, Italy and other European Union countries, as well as in certain other countries outside those regions, related to methods for treating muscle wasting disorders, including Duchenne Muscular Dystrophy ("DMD"), and cancer cachexia, and for treating conditions such as SUI and fecal incontinence, as well as sarcopenia, and increasing muscle performance, muscle size and muscle strength and increasing the strength of or mass of a bone and for treating bone related disorders, including bone frailty and osteoporosis. Issued patents for enobosarm composition of matter that GTx licensed from UTRF and issued in the United States expire in 2024. Issued patents for composition of matter for its other SARM compounds in the United States will expire from 2021-2029, depending on the specific SARM compound. The issued patents outside of the United States for enobosarm expire in 2025, and with respect to other SARM compounds, expire in 2023 and 2027, depending on the specific SARM compound. GTx has pending patent applications directed to composition of matter and methods of use for its other SARM compounds that, if issued, would expire in the United States and in countries outside the United

States in 2027. GTx has issued patents in the United States, and issued patents and pending applications in countries outside the United States for enobosarm and certain other SARM compounds as a feed composition for animals. The patents in the United States will expire in 2025. Issued patents outside the United States, and patent applications, if issued, which are pending outside the United States, will expire in 2027 or 2031 depending on the country. Patent applications which are pending in the United States and outside the United States using SARMs for SUI and pelvic floor disorders will expire in 2035, if the patents are issued. GTx's issued patent in the United States using enobosarm for DMD will expire in 2021. GTx's issued patent in the United States using other SARMs for DMD will expire in 2024. Patent applications, if issued, which are pending in the United States, using other SARMs for DMD will expire in 2024 or 2027 depending on the SARM.

GTx has its own issued patents and pending patent applications in the United States, Canada, Australia, Europe, Japan, China and other countries in Asia, as well as in certain other countries outside those regions, related to solid forms of enobosarm. Issued patents covering solid forms of enobosarm in the United States will expire in 2029. Issued patents and pending patent applications, if issued, in countries outside of the United States will expire in 2028. GTx has its own pending patent applications and issued patents in the United States and in Europe, Canada, Australia, Japan, China and other countries in Asia related to methods of treating breast cancer using its SARM compounds. Such patents and patent applications, if issued, would expire in 2033 in the United States and outside of the United States. GTx has issued patents in the United States directed to androgen receptor positive breast cancer in general, various categories of estrogen receptor and androgen receptor positive breast cancer, as well as triple negative breast cancer.

GTx cannot be certain that any of its pending patent applications, or those of UTRF, will result in issued patents. In addition, because the patent positions of biopharmaceutical companies are highly uncertain and involve complex legal and factual questions, the patents it owns and licenses, or any further patents it may own or license, may not prevent other companies from developing similar or therapeutically equivalent products. Patents also will not protect GTx's product candidates if competitors devise ways of making or using these product candidates without legally infringing its patents. In recent years, several companies have been extremely aggressive in challenging patents covering pharmaceutical products, and the challenges have often been successful. GTx cannot be assured that its patents will not be challenged by third parties or that it will be successful in any defense it undertakes. Failure to successfully defend a patent challenge could materially and adversely affect its business.

In addition, changes in patent laws, rules or regulations or in their interpretations in the United States and other countries by the courts may materially diminish the value of GTx's intellectual property or narrow the scope of its patent protection, which could have a material adverse effect on its business and financial condition.

GTx also relies on trade secrets, technical know-how and continuing innovation to develop and maintain its competitive position. GTx seeks to protect its proprietary information by requiring its employees, consultants, contractors, outside scientific collaborators and other advisors to execute non-disclosure and confidentiality agreements and its employees to execute assignment of invention agreements to it on commencement of their employment. Agreements with its employees also prevent them from bringing any proprietary rights of third parties to GTx. GTx also requires confidentiality or material transfer agreements from third parties that receive its confidential data or materials.

Government Regulation

New Drug Development and Approval Process

Numerous governmental authorities in the United States and other countries extensively regulate the testing, clinical development, manufacturing and marketing of pharmaceutical products and ongoing research and development activities. In the United States, the FDA rigorously reviews pharmaceutical products under the Federal Food, Drug, and Cosmetic Act and applicable regulations. Non-compliance with FDA regulations can

result in administrative and judicial sanctions, including warning or untitled letters, clinical holds, fines, recall or seizure of products, injunctions, total or partial suspension of production, refusal of the government to approve marketing applications or allow entry into supply contracts, refusal to permit import or export of products, civil penalties, criminal prosecution and other actions affecting a company and its products. The FDA also has the authority to revoke previously granted marketing authorizations.

To secure FDA approval, an applicant must submit extensive preclinical and clinical data, as well as information about product manufacturing processes and facilities and other supporting information to the FDA for each indication to establish a product candidate's safety and efficacy. The development and approval process takes many years, requires the expenditure of substantial resources and may be subject to delays or limitations of approval or rejection of an applicant's new drug application ("NDA"). Even if the FDA approves a product, the approval is subject to post-marketing surveillance, adverse drug experience and other recordkeeping and reporting obligations, and may involve ongoing requirements for post-marketing studies. The FDA also has authority to place conditions on any approvals that could restrict the commercial applications, advertising, promotion or distribution of these products. Product approvals may be withdrawn if compliance with regulatory standards is not maintained or if problems occur following initial marketing.

Preclinical and Clinical Testing

Preclinical studies involve laboratory evaluation of product characteristics and animal studies to assess the biological activity and safety of the product. In some cases, long-term preclinical studies are conducted while clinical studies are ongoing. The FDA, under its Good Laboratory Practices regulations, regulates preclinical studies. Violations of these regulations can, in some cases, lead to invalidation of the studies, requiring these studies to be replicated. When the preclinical testing is considered adequate by the sponsor to demonstrate the safety and scientific rationale for initial human studies, the results of the preclinical tests, together with manufacturing information and analytical data, are submitted to the FDA as part of an IND submission. The IND becomes effective, if not rejected by the FDA, within 30 days after the FDA receives the IND. The FDA may, either during the 30-day period after filing of an IND or at any future time, impose a clinical hold on proposed or ongoing clinical trials on various grounds, including that the study subjects are or would be exposed to an unreasonable and significant health risk. If the FDA imposes a clinical hold, clinical trials cannot commence or recommence without FDA authorization and then only under terms authorized by the FDA.

Clinical trials involve the administration of the investigational product candidates to humans under the supervision of a qualified principal investigator. Clinical trials must be conducted in accordance with Good Clinical Practices under protocols submitted to the FDA as part of the IND. In addition, each clinical trial must be approved and conducted under the auspices of an Investigational Review Board ("IRB"), and with patient informed consent. The IRB typically considers, among other things, ethical factors and the safety of human subjects.

Clinical trials are conducted in three sequential phases, but the phases may overlap. Phase 1 clinical trials usually involve healthy human subjects. The goal of a Phase I clinical trial is to establish initial data about the safety, tolerability and pharmacokinetic properties of the product candidates in humans. In Phase 2 clinical trials, controlled studies are conducted on an expanded population of patients with the targeted disease. The primary purpose of these tests is to evaluate the initial effectiveness of the product candidate on the intended target and to determine if there are any side effects or other risks associated with the drug and to determine the optimal dose of the drug from the safety and efficacy profile developed from the clinical study. Phase 3 trials involve even larger patient populations, often with several hundred or even several thousand patients, depending on the use for which the drug is being studied. Phase 3 trials are intended to establish the overall risk-benefit ratio of the drug and provide, if appropriate, an adequate basis for product labeling. During all clinical trials, physicians monitor the patients to determine effectiveness and to observe and report any reactions or other safety risks that may result from use of the product candidate.

Product Formulation and Manufacture

Concurrent with clinical trials and preclinical studies, companies must develop information about the chemistry and physical characteristics of the drug and finalize a process for manufacturing the product. In addition, manufacturers, including contract manufacturers, are required to comply with current applicable FDA Good Manufacturing Practice, or cGMP, regulations. The cGMP regulations include requirements relating to quality control and quality assurance, as well as the corresponding maintenance of records and documentation. The manufacturing process must be capable of consistently producing quality batches of the product and the manufacturer must develop methods for testing the quality, purity and potency of the final drugs. Additionally, appropriate packaging must be selected and tested and chemistry stability studies must be conducted to demonstrate that the product does not undergo unacceptable deterioration over its shelf-life.

Compliance with cGMP regulations also is a condition of new drug application approval. The FDA must approve manufacturing facilities before they can be used in the commercial manufacture of drug products. In addition, manufacturing establishments are subject to pre-approval inspections and unannounced periodic inspections.

New Drug Application Process

After the completion of the clinical trial phases of development, if the sponsor concludes that there is substantial evidence that the product candidate is safe and effective for its intended use, the sponsor may submit a NDA to the FDA. The application must contain all of the information on the product candidate gathered to that date, including data from the clinical trials, and be accompanied by a user fee.

Under the Prescription Drug User Fee Act (“PDUFA”), submission of a NDA with clinical data requires payment of a fee, with some exceptions. In return, the FDA assigns a goal of six or ten months from filing of the application to return of a first “complete response,” in which the FDA may approve the product or request additional information. There can be no assurance that an application will be approved within the performance goal timeframe established under PDUFA. The FDA initially determines whether a NDA as submitted is acceptable for filing. The FDA may refuse to file an application, in which case the FDA retains one-half of the user fees. If the submission is accepted for filing, the FDA begins an in-depth review of the application. As part of this review, the FDA may refer the application to an appropriate advisory committee, typically a panel of clinicians, for review, evaluation and a recommendation. The FDA is not bound by the recommendation of an advisory committee.

If the FDA evaluations of the NDA and the manufacturing facilities are favorable, the FDA may issue an approval letter authorizing commercial marketing of the product candidate for specified indications. The FDA could also issue a “complete response” letter at the end of the review period. A “complete response” letter will be issued to let a company know that the review period for a drug is complete and that the application is not yet ready for approval. The letter will describe specific deficiencies and, when possible, will outline recommended actions the applicant might take to get the application ready for approval, including calling for additional clinical trial data.

Marketing Approval and Post-Marketing Obligations

If the FDA approves an application, the drug becomes available for physicians to prescribe. Periodic reports must be submitted to the FDA, including descriptions of any adverse reactions reported. The FDA may require post-marketing studies, also known as Phase IV studies, as a condition of approval. In addition to studies required by the FDA after approval, trials and studies are often conducted to explore new indications for the drug. The purpose of these trials and studies and related publications is to develop data to support additional indications for the drug, which must be approved by the FDA, and to increase its acceptance in the medical community. In addition, some post-marketing studies are done at the request of the FDA to develop additional information regarding the safety of a product.

The FDA may impose risk evaluation mitigation strategies ("REMS"), on a product if the FDA believes there is a reason to monitor the safety of the drug in the marketplace. REMS could add training requirements for healthcare professionals, safety communications efforts, and limits on channels of distribution, among other things. The sponsor would be required to evaluate and monitor the various REMS activities and adjust them if need be. Whether a REMS would be imposed on a product and any resulting financial impact is uncertain at this time.

Any products manufactured or distributed pursuant to FDA approvals are subject to continuing regulation by the FDA, including record keeping requirements, reporting of adverse experiences with the drug, drug sampling and distribution requirements, notifying the FDA and gaining its approval of certain manufacturing or labeling changes, complying with certain electronic records and signature requirements, and complying with FDA promotion and advertising requirements. Drug manufacturers and their subcontractors are required to register their establishments and are subject to periodic unannounced inspections for compliance with cGMP requirements. Also, newly discovered or developed safety or effectiveness data may require changes to a product's approved labeling, including the addition of new warnings and contraindications, or even in some instances revocation or withdrawal of the product's approval.

Approval Outside of the United States

In order to market any product outside of the United States, GTx must comply with numerous and varying regulatory requirements of other countries regarding safety and efficacy and governing, among other things, clinical trials and commercial sales and distribution of GTx's products, which broadly reflect the issues addressed by the FDA above. Approval procedures vary among countries and can involve additional product testing and additional administrative review periods. The time required to obtain approval in other countries might differ from and be longer than that required to obtain FDA approval. Marketing approval in one country does not ensure marketing approval in another, but a failure or delay in obtaining marketing approval in one country may negatively impact the regulatory process in other countries.

As in the United States, the marketing approval process in Europe and in other countries is a lengthy, challenging and inherently uncertain process. If GTx fails to comply with applicable foreign regulatory requirements, it may be subject to fines, suspension or withdrawal of marketing approvals, product recalls, seizure of products, operating restrictions and criminal prosecution. Generally the development and approval procedures are harmonized throughout the European Union: however, there is limited harmonization in relation to national pricing and reimbursement practices.

Under European Union regulatory systems, a company may not market a medicinal product without marketing authorization. There are three procedures for submitting a MAA in the EU: (1) the mutual recognition procedure ("MRP"); (2) the decentralized procedure ("DCP") and (3) the centralized procedure ("CP"). The submission strategy for a given product will depend on the nature of the product, the target indication(s), the history of the product, and the marketing plan. The centralized procedure is compulsory for medicinal products which are produced by biotechnology processes, advanced therapy medicinal products and orphan drugs. Besides the products falling under the mandatory scope, the centralized procedure is also open for other innovative products that are new active substances or other medicinal products that constitute a significant therapeutic, scientific or technical innovation.

The centralized procedure leads to approval of the product in all 27 EU member states and in Norway, Iceland and Liechtenstein. Submission of one MAA thus leads to one assessment process and one authorization that allows access to all applicable markets within the entire EU. The process of the centralized procedure is triggered when the applicant sends the letter announcing the intent to submit a MAA (letter of intent). The letter of intent also initiates the assignment of the Rapporteur and Co-Rapporteur, who are the two appointed members of the Committee for Human Medicinal Products ("CHMP"), representing two EU member states. However, in light of the United Kingdom's vote in 2016 to leave the European Union, the so-called Brexit vote, there may be changes forthcoming in the scope of the centralized approval procedure as the terms of that exit are negotiated between the UK and the European Union.

When using the MRP or DCP, the applicant must select which and how many EU member states in which to seek approval. In the case of an MRP, the applicant must initially receive national approval in one EU member state. This will be the so-called reference member state ("RMS") for the MRP. Then, the applicant seeks approval for the product in other EU member states, the so-called concerned member states ("CMS") in a second step: the mutual recognition process. For the DCP, the applicant will approach all chosen member states at the same time. To do so, the applicant will identify the RMS that will assess the submitted MAA and provide the other selected member states with the conclusions and results of the assessment.

When the application for marketing authorization is made, the competent authority responsible for granting a marketing authorization must verify whether the application complies with the relevant requirements, including compliance with the agreed pediatric investigational plan ("PIP"). Assuming it does, the marketing authorization may be granted and the relevant results are included in the summary of product characteristics ("SmPC") for the product, along with a statement indicating compliance with the agreed PIP. It is not necessary for the product actually to be indicated for use in the pediatric population (for example, if the results show that that would not be appropriate).

Drug Price Competition and Patent Term Restoration Act of 1984

Under the Drug Price Competition and Patent Term Restoration Act of 1984, known as the Hatch-Waxman Act, a portion of a product's patent term that was lost during clinical development and application review by the FDA may be restored. The Hatch-Waxman Act also provides for a statutory protection, known as exclusivity, against the FDA's acceptance or approval of certain competitor applications. The Hatch-Waxman Act also provides the legal basis for the approval of abbreviated new drug applications ("ANDAs").

Patent term extension can compensate for time lost during product development and the regulatory review process by returning up to five years of patent life for a patent that covers a new product or its use. This period is generally one-half the time between the effective date of an IND and the submission date of a NDA, plus the time between the submission date of a NDA and the approval of that application. Patent term extensions, however, are subject to a maximum extension of five years, and the patent term extension cannot extend the remaining term of a patent beyond a total of 14 years.

The application for patent term extension is subject to approval by the United States Patent and Trademark Office in conjunction with the FDA. It generally takes at least six months to obtain approval of the application for patent term extension.

The Hatch-Waxman Act also provides for a period of statutory protection for new drugs that receive NDA approval from the FDA. If a new drug receives NDA approval as a new chemical entity, meaning that the FDA has not previously approved any other new drug containing the same active entity, then the Hatch-Waxman Act prohibits an ANDA or a NDA submitted pursuant to section 505(b)(2) of the Federal Food, Drug, and Cosmetics Act, where the applicant does not own or have a legal right of reference to all of the data required for approval to be submitted by another company for a generic version of such drug (505(b)(2) NDA), with some exceptions, for a period of five years from the date of approval of the NDA. The statutory protection provided pursuant to the Hatch-Waxman Act will not prevent the filing or approval of a full NDA, as opposed to an ANDA or 505(b)(2) NDA, for any drug, including, for example, a drug with the same active ingredient, dosage form, route of administration, strength and conditions of use. In order to obtain a NDA, however, a competitor would be required to conduct its own clinical trials, and any use of the drug for which marketing approval is sought could not violate another NDA holder's patent claims.

If NDA approval is received for a new drug containing an active ingredient that was previously approved by the FDA but the NDA is for a drug that includes an innovation over the previously approved drug, for example, a NDA approval for a new indication or formulation of the drug with the same active ingredient, and if such NDA approval was dependent upon the submission to the FDA of new clinical investigations, other than bioavailability

studies, then the Hatch-Waxman Act prohibits the FDA from making effective the approval of an ANDA or 505(b)(2) NDA for a generic version of such drug for a period of three years from the date of the NDA approval. This three year exclusivity, however, only covers the innovation associated with the NDA to which it attaches. Thus, the three year exclusivity does not prohibit the FDA, with limited exceptions, from approving ANDAs or 505(b)(2) NDAs for drugs containing the same active ingredient but without the new innovation.

While the Hatch-Waxman Act provides certain patent restoration and exclusivity protections to innovator drug manufacturers, it also permits the FDA to approve ANDAs for generic versions of their drugs assuming the approval would not violate another NDA holder's patent claims. The ANDA process permits competitor companies to obtain marketing approval for a drug with the same active ingredient for the same uses but does not require the conduct and submission of clinical studies demonstrating safety and effectiveness for that product. Instead of safety and effectiveness data, an ANDA applicant needs only to submit data demonstrating that its product is bioequivalent to the innovator product as well as relevant chemistry, manufacturing and product data. The Hatch-Waxman Act also instituted a third type of drug application that requires the same information as a NDA, including full reports of clinical and preclinical studies, except that some of the information from the reports required for marketing approval comes from studies which the applicant does not own or have a legal right of reference. This type of application, a 505(b)(2) NDA, permits a manufacturer to obtain marketing approval for a drug without needing to conduct or obtain a right of reference for all of the required studies.

If a competitor submits an ANDA or 505(b)(2) NDA for a compound or use of any compound covered by another NDA holder's patent claims, the Hatch-Waxman Act requires, in some circumstances, the applicant to notify the patent owner and the holder of the approved NDA of the factual and legal basis of the applicant's opinion that the patent is not valid or will not be infringed. Upon receipt of this notice, the patent owner and the NDA holder have 45 days to bring a patent infringement suit in federal district court and obtain a 30-month stay against the company seeking to reference the NDA. The NDA holder could still file a patent suit after the 45 days, but if they miss the 45-day deadline, they would not have the benefit of the 30-month stay. Alternatively, after this 45-day period, the applicant may file a declaratory judgment action, seeking a determination that the patent is invalid or will not be infringed. Depending on the circumstances, however, the applicant may not be able to demonstrate a controversy sufficient to confer jurisdiction on the court. The discovery, trial and appeals process in such suits can take several years. If such a suit is commenced, the Hatch-Waxman Act provides a 30-month stay on the approval of the competitor's ANDA or 505(b)(2) NDA. If the litigation is resolved in favor of the competitor or the challenged patent expires during the 30-month period, unless otherwise extended by court order, the stay is lifted and the FDA may approve the application. Under regulations issued by the FDA, and essentially codified under the Medicare prescription drug legislation, the patent owner and the NDA holder have the opportunity to trigger only a single 30-month stay per ANDA or 505(b)(2) NDA. Once the applicant of the ANDA or 505(b)(2) NDA has notified the patent owner and the NDA holder of the infringement, the applicant cannot be subjected to another 30-month stay, even if the applicant becomes aware of additional patents that may be infringed by its product.

Pharmaceutical Pricing and Reimbursement

GTx currently has no marketed products. In both domestic and foreign markets, sales of any products for which GTx receives regulatory approval for commercial sale will depend in part on the availability of reimbursement from third-party payors. Third-party payors include government authorities or programs, managed care providers, private health insurers and other organizations. These third-party payors are increasingly challenging the price and examining the cost-effectiveness of medical products and services. In addition, significant uncertainty exists as to the reimbursement status of newly approved healthcare products. GTx may need to conduct expensive pharmacoeconomic studies in order to demonstrate the cost-effectiveness of its products. GTx's product candidates may not be considered cost-effective. Adequate third-party reimbursement may not be available to enable it to maintain price levels sufficient to realize an appropriate return on GTx's investment in product development. Third-party payors may also control access to, or manage utilization of, its products with various utilization management techniques, such as requiring prior authorization for coverage of its products.

Within the United States, if GTx obtains appropriate approval in the future to market any of its oral drug product candidates, those products could potentially be covered by various government health benefit programs as well as purchased by government agencies. The participation in such programs or the sale of products to such agencies is subject to regulation. The marketability of any products for which GTx receives regulatory approval for commercial sale may suffer if the government and third-party payors fail to provide adequate coverage and reimbursement.

Medicaid is a joint federal and state program that is administered by the states for low income and disabled beneficiaries. Under the Medicaid Drug Rebate Program, participating manufacturers are required to pay a rebate for each unit of product reimbursed by the state Medicaid programs. The amount of the rebate for each product is set by law and may be subject to an additional discount if certain pricing increases more than inflation.

Medicare is a federal program that is administered by the federal government that covers individuals age 65 and over as well as those with certain disabilities. Oral drugs may be covered under Medicare Part D. Medicare Part D provides coverage to enrolled Medicare patients for self-administered drugs (*i.e.*, drugs that do not need to be injected or otherwise administered by a physician). Medicare Part D is administered by private prescription drug plans approved by the U.S. government and each drug plan establishes its own Medicare Part D formulary for prescription drug coverage and pricing, which the drug plan may modify from time-to-time. The prescription drug plans negotiate pricing with manufacturers and may condition formulary placement on the availability of manufacturer discounts. Since 2011, manufacturers with marketed brand name drugs have been required to provide a 50% discount the negotiated price for on brand name prescription drugs utilized by Medicare Part D beneficiaries when those beneficiaries reach the coverage gap in their drug benefits, and, beginning in 2019, that discount increased to 70%.

Drug products are subject to discounted pricing when purchased by federal agencies via the Federal Supply Schedule (“FSS”). FSS participation is required for a drug product to be covered and reimbursed by certain federal agencies and for coverage under Medicaid, Medicare Part B and the Public Health Service (“PHS”) pharmaceutical pricing program. FSS pricing is negotiated periodically with the Department of Veterans Affairs. FSS pricing is intended not to exceed the price that a manufacturer charges its most-favored non-federal customer for its product. In addition, prices for drugs purchased by the Veterans Administration, Department of Defense (including drugs purchased by military personnel and dependents through the TRICARE retail pharmacy program), Coast Guard, and PHS are subject to a cap on pricing (known as the “federal ceiling price”) and may be subject to an additional discount if pricing increases more than the rate of inflation.

To maintain coverage of drugs under the Medicaid Drug Rebate Program, manufacturers are required to extend discounts to certain purchasers under the PHS pharmaceutical pricing program. Purchasers eligible for discounts include hospitals that serve a disproportionate share of financially needy patients, community health clinics and other entities that receive health services grants from the PHS.

The United States and state governments continue to propose and pass legislation designed to reform delivery of, or payment for, health care, which include initiatives to reduce the cost of healthcare. For example, in March 2010, the United States Congress enacted the Patient Protection and Affordable Care Act and the Health Care and Education Reconciliation Act (“Healthcare Reform Act”) which includes changes to the coverage and reimbursement of drug products under government health care programs. Under the Trump administration, there have been ongoing efforts to modify or repeal all or certain provisions of the Healthcare Reform Act. For example, tax reform legislation was enacted at the end of 2017 that eliminates the tax penalty for individuals who do not maintain sufficient health insurance coverage beginning in 2019 (the so-called “individual mandate”). In a May 2018 report, the Congressional Budget Office estimated that, compared to 2018, the number of uninsured will increase by 3 million in 2019 and 6 million in 2028, in part due to the elimination of the individual mandate. The Healthcare Reform Act has also been subject to judicial challenge. In December 2018, a federal district court judge, in a challenge brought by a number of state attorneys general, found the Healthcare Reform Act unconstitutional in its entirety because, once Congress repealed the individual mandate provision, there was no

longer a basis to rely on Congressional taxing authority to support enactment of the law. Pending appeals, which could take some time, the Healthcare Reform Act is still operational in all respects.

There have also been other reform initiatives under the Trump Administration, including initiatives focused on drug pricing. For example, in May of 2018, President Trump and the Secretary of the Department of Health and Human Services released a "blueprint" to lower prescription drug prices and out-of-pocket costs. Certain proposals in the blueprint, and related drug pricing measures proposed since the blueprint, could cause significant operational and reimbursement changes for the pharmaceutical industry. As another example, in November of 2018, CMS issued an advance notice of proposed rulemaking that proposed revisions to Medicare Part D to support health plans' negotiation of lower drug prices with manufacturers and reduce health plan members' out-of-pocket costs. The HHS Office of Inspector General also issued a proposed rule in February of 2019 that would revise the federal anti-kickback statute to limit protection for discounts offered by pharmaceutical manufacturers to pharmacy benefit managers ("PBMs"), Medicare Part D plans, and Medicaid managed care plans that are not reflected in the price charged to the patient at the pharmacy counter and to provide protection only for certain types of service fees paid by pharmaceutical manufacturers to PBMs.

Recently, there has been considerable public and government scrutiny in the U.S. of pharmaceutical pricing and proposals to address the perceived high cost of pharmaceuticals. There have also been several recent state legislative efforts to address drug costs, which generally have focused on increasing transparency around drug costs or limiting drug prices or price increases. Adoption of new legislation at the federal or state level could affect demand for, or pricing of, GTx's product candidates if approved for sale.

GTx cannot predict the ultimate content, timing or effect of any changes to the Healthcare Reform Act or other federal and state reform efforts. There is no assurance that federal or state health care reform will not adversely affect its future business and financial results.

Although GTx currently has no products approved for commercial sale, GTx marketed FARESTON through September 30, 2012 and the product was covered under various government health benefit programs as well as purchased by federal agencies. GTx could be subject to liability under federal laws regulating GTx's participation in such programs or the sale of GTx's product to such agencies if it failed to comply with applicable requirements, including reporting prices for its products or offering products for sale at certain prices.

Regulations Pertaining to Sales and Marketing

Although GTx currently has no products approved for commercial sale, GTx may be subject to various federal and state laws pertaining to health care "fraud and abuse," including anti-kickback laws and false claims laws for activities related to its previous sales of FARESTON, which GTx sold to a third-party in 2012, or to future sales of any of its product candidates that may in the future receive regulatory and marketing approval. Anti-kickback laws generally prohibit a prescription drug manufacturer from soliciting, offering, receiving, or paying any remuneration to generate business, including the purchase or prescription of a particular drug. Although the specific provisions of these laws vary, their scope is generally broad and there may not be regulations, guidance or court decisions that apply the laws to particular industry practices. There is therefore a possibility that GTx's practices might be challenged under such anti-kickback laws. False claims laws prohibit anyone from knowingly and willingly presenting, or causing to be presented, any claims for payment for reimbursed drugs or services to third-party payors (including Medicare and Medicaid) that are false or fraudulent. Violations of fraud and abuse laws may be punishable by criminal or civil sanctions, including fines and civil monetary penalties, and/or exclusion from federal health care programs (including Medicare and Medicaid).

Laws and regulations have been enacted by the federal government and various states to regulate the sales and marketing practices of pharmaceutical manufacturers with marketed products. The laws and regulations generally limit financial interactions between manufacturers and health care providers and/or require disclosure to the government and public of such interactions. Many of these laws and regulations contain ambiguous requirements

or require administrative guidance for implementation. Given the lack of clarity in laws and their implementation, GTx's prior activities (when it marketed FARESTON) or any future activities (if it obtains approval and/or reimbursement from federal healthcare programs for its product candidates) could be subject to the penalty provisions of the pertinent laws and regulations.

Employees

As of March 31, 2019, GTx had 13 employees, three of whom were M.D.s, Pharm.D.s and/or Ph.D.s. None of GTx's employees are subject to a collective bargaining agreement. GTx believes that it has good relations with its employees.

Available Information

GTx was originally incorporated under the name Genotherapeutics, Inc. in Tennessee in September 1997. GTx changed its name to GTx, Inc. in 2001, and it reincorporated in Delaware in 2003. GTx's principal executive office is located at 17 W Pontotoc Ave., Suite 100, Memphis, TN 38103, and its telephone number is (901) 523-9700.

GTx files electronically with the U.S. Securities and Exchange Commission, or SEC, its annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934.

ONCTERNAL BUSINESS

Overview

Oncternal Therapeutics, Inc. is a clinical-stage biopharmaceutical company focused on developing a diverse pipeline of product candidates for cancers with critical unmet medical need. The company's development efforts are focused on promising, yet untreated biological pathways implicated in cancer generation or progression. Receptor tyrosine kinase-like Orphan Receptor 1 ("ROR1"), is a growth factor receptor that is widely expressed on many tumors and whose overexpression has been correlated with poor prognosis, which activates pathways that lead to increased tumor proliferation, invasiveness and drug resistance. Oncternal's lead product candidate is cirmtuzumab, a monoclonal antibody that is designed to inhibit the ROR1 receptor, which is being evaluated in a Phase 1/2 clinical trial in combination with ibrutinib for the treatment of chronic lymphocytic leukemia ("CLL"), and mantle cell lymphoma ("MCL"), and in a Phase 1b clinical trial in combination with paclitaxel for women with metastatic breast cancer. Oncternal is also developing TK216, a small molecule that is designed to inhibit ETS, or E26 Transformation Specific, family oncoproteins, which alter gene transcription and RNA processing and lead to increased cell proliferation and invasion. TK216 is being evaluated in a Phase 1 clinical trial, alone and in combination with vincristine, in patients with relapsed or refractory Ewing sarcoma, a rare pediatric cancer. In addition, Oncternal is developing a CAR-T product candidate that targets ROR1, which is currently in preclinical development as a potential treatment for solid tumors and hematologic cancers including AML.

Cirmtuzumab targets ROR1, a receptor that is widely expressed on many tumors, but one that has not been successfully targeted by other therapies. Researchers at UC San Diego discovered that targeting a critical epitope on ROR1 was the key to specifically targeting ROR1 expressing tumors and this finding led to the discovery of the potent and highly selective activity of cirmtuzumab observed in preclinical studies. ROR1 activates pathways that lead to increased cancer cell proliferation, invasiveness and drug resistance. Oncternal believes ROR1 is an attractive target for cancer therapy because it is an oncofetal antigen – a protein not normally expressed in adults. Overexpression of ROR1 in tumors results in cancer cells becoming less differentiated, increasing their ability to self-renew and metastasize by increasing cell migration and the ability to initiate new tumors. Patients with tumors that overexpress ROR1 have poor prognoses, consistent with the increased cell migration, tumor initiation, and chemotherapy resistance observed in preclinical models. Oncternal in-licensed cirmtuzumab from UC San Diego and is developing it in collaboration with UC San Diego and CIRM.

Cirmtuzumab is a potential first-in-class antibody product candidate directed at ROR1, and the first to enter clinical trials. Oncternal believes that preclinical results suggest the potential to reverse the self-renewing stem-like properties of cancer cells, which may lead to anti-tumor effects including sensitizing tumors to other therapies. Interim results of the company's Phase 1/2 clinical trial of cirmtuzumab in combination with ibrutinib, an approved inhibitor of Bruton's tyrosine kinase for the treatment of patients with CLL or MCL, indicate that several patients have achieved complete responses, which are uncommon with ibrutinib alone. Cirmtuzumab is also in a Phase 1b investigator-initiated clinical trial for the treatment of women with advanced breast cancer where it is being dosed in combination with paclitaxel, a standard of care chemotherapy agent for this indication. Based on the high levels of overexpression in multiple tumors and the importance of ROR1 for tumor proliferation and metastases, Oncternal believes that cirmtuzumab has potential in other solid tumors with high unmet medical need including lung and prostate cancers.

TK216 was the product of a novel approach based on developing small molecule inhibitors of a critical protein-protein interaction linked to the ETS family of transcription factors. Tumorigenic gene fusions involving ETS factors are frequently found in tumors such as Ewing sarcoma and prostate cancer and ETS factors are often overexpressed in other tumors such as AML. Despite the importance of these factors in the oncogenic process, inhibitors of their function had not previously been identified. Researchers at Georgetown University identified the precursor to TK216 by using a chemical screening assay that they developed based on a deep understanding of the underlying biological mechanism of ETS factors. In preclinical models, TK216 has been shown to inhibit the interaction between ETS family members and RNA helicase A ("RHA"), and by doing so, effectively shuts

down excessive cell proliferation. Oncternal is currently enrolling patients with relapsed or refractory Ewing sarcoma, an aggressive, rare pediatric cancer, in a Phase 1 clinical trial of TK216. A dose-finding arm of this study is nearing completion and the company expects to begin enrolling patients in an expansion cohort to evaluate the clinical response of treatment with TK216 in combination with vincristine, an approved chemotherapy agent that is commonly used in combination programs to treat Ewing sarcoma. Oncternal in-licensed TK216 from Georgetown University.

Oncternal is also developing a ROR1 targeted chimeric antigen receptor T cell, or CAR-T, product candidate based on the binding domain of cirmtuzumab as a potential treatment for patients with aggressive hematological malignancies or solid tumors that may require the increased potency of a CAR-T therapy may justify the potential increased toxicity that has been seen with other CAR-T therapies. The company believes that the selective expression of ROR1 on tumor cells and its absence on normal cells make it an ideal target for a CAR-T approach. In addition, the company believes that resistance to ROR1 CAR-T therapy may be less likely to develop because ROR1 stimulates a survival and fitness pathway in cancer cells, and mutations that inactivated or suppressed ROR1 would potentially diminish the cancer cells' stem cell-like properties, limiting their ability to metastasize or establish new tumors. Oncternal's ROR1 targeted CAR-T product candidate is in preclinical development at UC San Diego, with funding from the CIRM.

Oncternal's scientific founders and management team have significant experience in successfully developing and commercializing medicines for endocrine and orphan diseases. Oncternal's CEO, James Breitmeyer, played important roles in the development and approval of a number of drugs, including Fertinex, Geref, Gonal-F, Ofirmev, Rebif, Saizen, Serostim, and Zohydro. David Hale, chairman of Oncternal, is an industry veteran and investor, involved in numerous successful private and public biotech companies, including Micromet, CancerVax, Gensia, Viagene, Santarus and Hybritech.

Oncternal's strategy

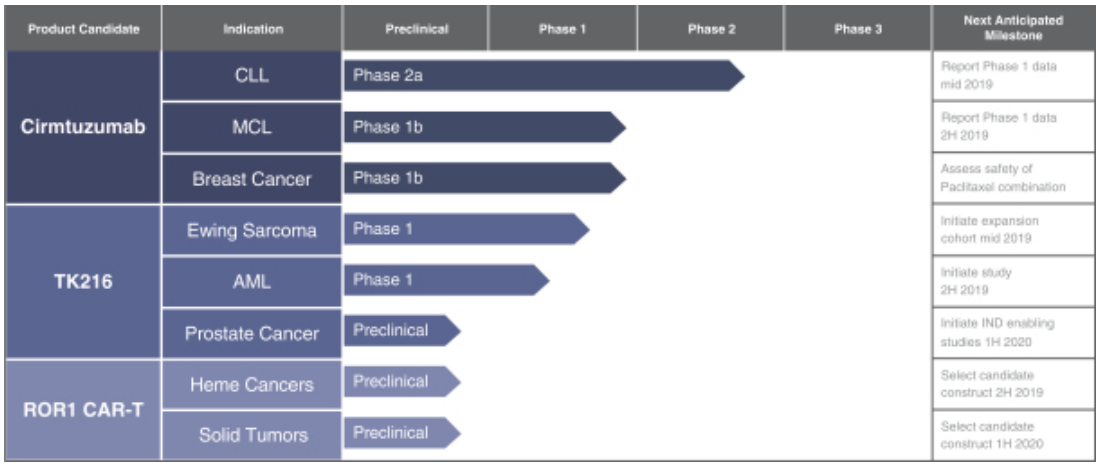
Oncternal's mission is to build a leading oncology company that creates distinct and transformative treatments for a wide range of oncology indications in which there is significant unmet medical need. Oncternal's product development strategy is based on the belief that, despite the long history of pharmaceutical development in oncology, there still exists a wide array of therapeutic targets and targeting mechanisms that have yet to be vigorously pursued by pharmaceutical companies. The company's current pipeline is derived from its ability to identify potential assets that have generated promising, late-stage preclinical results or early clinical data, and in-license them for further clinical development. Oncternal is particularly focused on assets for which there is a genetic or protein marker that can be used to identify populations of patients most likely to respond. The company prioritizes targets that it believes have the potential to transform the treatment of difficult-to-treat cancers with either a single agent or as combination therapy. As is the case for many oncology products, Oncternal believes that potential efficacy in one indication suggests the potential for application in other indications that carry the same target.

Key elements of Oncternal's strategy are as follows:

- Rapidly advance the company's lead product candidate, cirmtuzumab, through clinical development, initially in CLL, MCL and breast cancer;
- Generate clinical proof of concept data with TK216 in Ewing sarcoma, an orphan pediatric cancer and AML;
- Evaluate cirmtuzumab in additional ROR1-positive tumors such as lung, ovarian and prostate cancers; and
- Advance to clinical testing of ROR1-targeting CAR-T technology.

Pipeline

The following figure summarizes our current programs:



Cirmtuzumab

Oncternal's lead product candidate, cirmtuzumab, is an investigational, humanized monoclonal antibody that was designed to bind to a specific epitope of ROR1, a protein expressed on many tumors, but not to bind to normal adult tissues. Cirmtuzumab was developed in the laboratory of one of the company's scientific advisor, Thomas Kipps, M.D., Ph.D., Professor of Medicine and Evelyn and Edwin Tasch Chair in Cancer Research at UC San Diego with support from CIRM. The company exclusively in-licensed cirmtuzumab for therapeutic use from UC San Diego. The company is studying cirmtuzumab in CLL, MCL, and advanced breast cancer.

Cirmtuzumab has completed a Phase 1a dose-finding trial in patients with CLL and is currently enrolling a Phase 1b/2 trial of cirmtuzumab in combination with ibrutinib in patients with CLL and MCL.

Scientific Background

Cirmtuzumab's discovery was based on the characteristics of autoantibodies that developed in patients enrolled in an investigator initiated clinical trial that was designed to elicit an immune response to CLL cells. CLL cells, modified using gene therapy to become more immunogenic, were used as autologous vaccines to immunize patients against their own tumors. Of the autoantibodies developed, antibodies against ROR1 were identified as having selective antitumor activity against CLL cells from both the vaccinated patient themselves and against CLL cells from other patients. Cirmtuzumab was designed to bind to the epitope on ROR1 that is associated with this activity. Unlike ROR1 antibodies that bind to other epitopes of ROR1, cirmtuzumab has not been observed to bind to normal adult tissues such as adipose tissue or pancreatic islet cells.

ROR1 is a protein that is preferentially expressed on multiple cancers and is essential for their survival, migration and proliferation. ROR1 is a member of the receptor tyrosine kinase ("RTK"), family of proteins, a group of proteins that have been shown to be effective targets for cancer therapies. Examples of approved RTK-targeted therapies include trastuzumab which targets the human epidermal growth factor receptor 2 ("HER2"), protein, and is marketed as Herceptin by Genentech for the treatment of advanced breast cancer and HER2-overexpressing metastatic gastric or gastroesophageal junction adenocarcinoma; and cetuximab which targets the epidermal growth factor receptor, or EGFR, and is marketed as Erbitux by Eli Lilly for the treatment of head and neck cancer and colorectal cancer. Approved therapeutic agents that target RTKs are thought to have been

effective, not only because of selective RTK expression, but because these RTKs have a vital role in promoting the growth and survival of malignant cells.

Oncternal believes that ROR1 represents an attractive target for cancer therapy for several reasons, beginning with its pattern of expression. During fetal development, ROR1 is broadly expressed and is essential for normal fetal development. After birth, the ROR1 gene is suppressed, and ROR1 expression on adult cells is greatly reduced. The known cases when ROR1 is switched back on are limited to cancer cells. The switching on of ROR1 is consistent with the typical pattern in cancer in which normal cells lose their highly differentiated functions and abilities and return to a more primal state in which they exhibit a greatly increased capacity for proliferation. This dedifferentiation activates a number of genes normally restricted to fetal development, one of which is ROR1. Cancer cells with the highest potential for self-renewal, which are sometimes referred to as tumor-initiating cells or cancer stem cells, are capable of invading other tissues or metastasizing to disseminate tumors to distant sites in the body. These tumor-initiating cells are also the cells that have been found to be the most resistant to current therapies including chemotherapy and radiation therapy. Expression of ROR1 in ovarian cancer, for example, appears highest in a subpopulation of tumor cells that also have other markers of cancer stem cells. Cells that overexpress ROR1 show increased survival, migration, and resistance to chemotherapy.

In adults, ROR1 expression is very limited on normal cells, but ROR1 is overexpressed on CLL cells and other tumor cells. CLL patients with high levels of ROR1 have more aggressive disease that requires treatment earlier than those with lower levels. These patients also have a significant reduction survival: CLL patients having high ROR1 expression have an approximately 50% survival rate at twenty years compared to an 80% survival rate for those with low ROR1 expression.

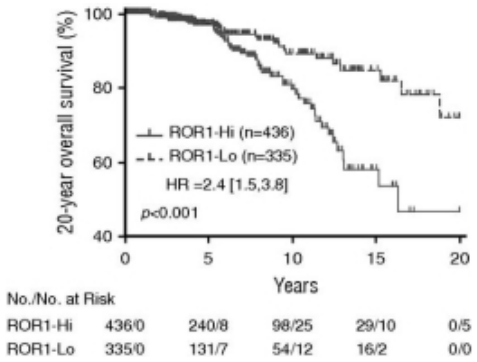


Figure 1. CLL patients with high levels of ROR1 expression have lower overall survival than those with low levels of ROR1

ROR1 is also expressed in a variety of other cancers, particularly those that are less differentiated, and is associated with early relapse after therapy or metastasis. Histological staining of over 350 human tumor samples identified that a majority expressed ROR1, including 90% or more of uterine cancers, lymphomas, and prostate cancers.

Cancer type	ROR1 Expressed (%)	Cancer type	ROR1 Expressed (%)
Uterus	96%	Lung	77%
Lymphoma	90%	Breast	75%
Prostate	90%	Testicular	73%
Skin	89%	Colon	57%
Pancreas	83%	Ovarian	54%
Adrenal	83%	Bladder	43%

ROR1 expression is substantially higher in tumors that are more advanced and that contain poorly differentiated cells. Whereas Grade 1 or 2 ovarian tumors have been found to be 21% positive for ROR1, Grade 3 or 4 tumors have been found to be 62% positive. Similar increases in the percent of ROR1 positive tumors were seen in pancreatic cancers, with 54% of Grade 1 or 2 tumors and 100% of Grade 3 or 4 tumors testing positive for ROR1.

The ligand for ROR1 in hematologic malignancies is Wnt5a, a secreted glycoprotein that has a critical role in embryonic and fetal development. During development, Wnt5a controls the ability of stem cells to self-renew as well as regulating cell migration and adhesion. Cancer patients whose tumors have high levels of Wnt5a have a lower probability of long-term survival than patients with low Wnt5a levels, analogous to the situation for patients whose tumors express ROR1. In tumor models derived from primary human tumors, such as glioblastoma, overexpression of Wnt5a has been observed to lead to tumors with more rapid growth that have increased invasiveness into other tissues. Similarly, cells from human melanoma engineered to overexpress Wnt5a have shown increased motility and invasiveness.

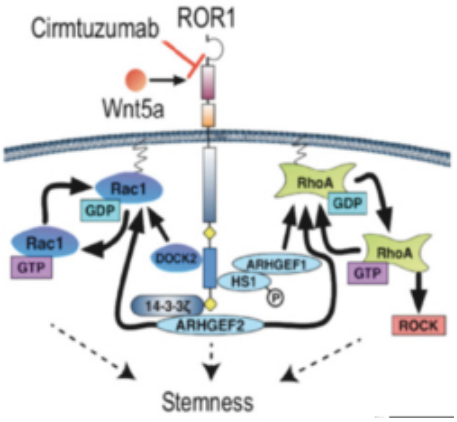


Figure 2. Cirmtuzumab blocks activation of ROR1 by Wnt5a preventing a cascade of intracellular signaling events that lead to expression of genes associated with dedifferentiated stem cells

Studies in mice have shown that ROR1 accelerated the development and progression of leukemia in models of CLL and that Wnt5a enhanced CLL cell viability, migration and proliferation in a ROR1-dependent manner. Inhibition or silencing of ROR1 signaling in multiple cancer models, including breast cancer, ovarian cancer, and glioblastoma suppressed the expression of genes related to tumor initiating cells and repressed cancer migration and metastasis. In this model, ROR1 levels were selectively reduced using a genetic construct that delivers a short-hairpin RNA (“shRNA”), that is intended to prevent ROR1 protein from being produced.

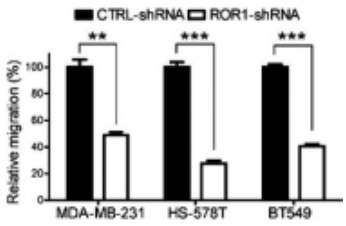


Figure 3. Suppression of ROR1 reduced migration in multiple cell lines

In summary, Oncternal believes that ROR1 is an attractive therapeutic target in oncology for several reasons:

- ROR1 is widely expressed on many tumors, including hematological malignancies and solid tumors
- Tumors with high levels of ROR1 expression result in more rapid progression and shorter overall survival
- ROR1 expression leads to dedifferentiation of cells, increasing their self-renewal and survival potential
- ROR1 expression is increased in cells resistant to chemotherapy
- When stimulated by Wnt5a, ROR1 leads to increased tumor cell migration and invasiveness

CLL disease overview

CLL is the most common form of leukemia in adults, accounting for 25-30% of all leukemias in the United States. There are an estimated 21,000 new cases of CLL each year with a prevalence of 130,000 in the United States. CLL is primarily a disease of older adults. The median age of diagnosis is about 70 years of age. Most patients are diagnosed through the result of routine blood work when elevated levels of lymphocytes are detected.

Until about 2005, CLL was traditionally treated with standard cytotoxic agents such as fludarabine, chlorambucil, cyclophosphamide, and bendamustine. The landscape for CLL therapy then began to change dramatically based on the introduction of rituximab, marketed as Rituxan by Genentech, into the standard CLL treatment paradigm. Rituximab is a monoclonal antibody that specifically recognizes CD20, an antigen on B-cells from which the tumor cells in CLL arise. Rituximab, which was approved for use in CLL only in 2010 but was previously widely prescribed off-label, has typically been used in combination with cytotoxic agents, resulting in significant improvements in progression-free survival of later-stage patients. This drug combination is still a treatment option for younger patients who can tolerate the side effects of the associated chemotherapy.

Over the past few years, regulatory agencies have approved additional monoclonal antibody products that target CD20, as well as antibodies targeting another surface protein found on CLL tumor cells known as CD52, and three classes of small molecules: ibrutinib, an inhibitor of Bruton's tyrosine kinase or BTK, a key component of cell signaling in B-cells, which is marketed as Imbruvica by AbbVie and Johnson & Johnson; venetoclax, an inhibitor of the protein B-cell lymphoma-2, or Bcl-2, which is marketed as Venclexta and Venclyxto by AbbVie and Roche/Genentech; and idelalisib, an inhibitor of Phosphoinositide 3-kinase, or PI3K, which is marketed as Zydelig by Gilead Sciences. These agents are approved for use as single agents but are being investigated in combination with each other and with various monoclonal antibody products. Clinicians are investigating their potential in earlier stage disease in multiple clinical trials. Combinations of these new small molecules with the monoclonal antibodies are defining a new standard of care in CLL. The most recently reported five-year survival rate for patients with newly diagnosed CLL is 84.2% which, although it does not reflect all of the potential benefits derived from the more recently approved therapies, represents an improvement from the approximately 65% survival rate from the 1970's.

While these new therapies extend survival of patients with CLL, only a limited number of patients achieve a complete response, or CR, which is defined by three factors: the normalization of blood counts, an observed normalization in lymph node and/or spleen size, and normalization of the histological appearance of the bone marrow. The proportion of patients with relapsed or refractory CLL who achieve a CR when treated with single-agent ibrutinib is consistently below 10%. In one study, approximately 26% of treatment-naïve patients treated with ibrutinib monotherapy achieve a CR with a median duration of response of 14.7 months. Subsequent trials have not shown a significant improvement in the rate of CR when ibrutinib is used in combination with rituximab.

The market for CLL therapies in the United States, France, Germany, Italy, Spain, the UK, and Canada is estimated to be over $7 billion, with the majority of sales associated with recently-approved therapies, including

ibrutinib, venetoclax and idelalisib. Oncternal believes that CLL represents an attractive clinical and commercial opportunity for cirmtuzumab.

MCL disease overview

MCL is an aggressive form of non-Hodgkin's lymphoma. There are approximately 4,200 new cases of MCL each year in the United States, with the average age at diagnosis in the mid-60s. Most patients with MCL have advanced stage disease at diagnosis characterized by swollen lymph nodes as outward signs of disease that has spread to other organs in the body. MCL has a poor prognosis with a median survival time of individuals with MCL of about two to five years. The 10-year survival rate is only approximately 5%-10%.

While there are several therapeutic options available to treat MCL, none of these options offers long-term benefit, with most patients relapsing in less than 18 months. Similar to CLL, MCL is a cancer of B cells and is treated with some of the same therapies utilized to treat CLL. Newly diagnosed patients are typically treated with rituximab combined with a chemotherapy regimen known as CHOP, comprised of cyclophosphamide, doxorubicin, vincristine, and prednisone. Alternative chemotherapy regimens include bortezomib or bendamustine. Patients with clinical responses to chemotherapy may become candidates for another therapeutic approach, autologous stem cell transplantation, a procedure in which radiation and/or chemotherapy is used to eliminate the patient's immune cells, including residual MCL cells. Recently, ibrutinib was granted accelerated approval by the FDA for the treatment of relapsed MCL on the basis of overall response rates of 72% and a CR rate of 19%. All of these therapies, however, are associated with significant toxicity and, given that the majority of patients with MCL are advanced in age, the company believes that less aggressive and more effective therapies are needed.

Despite continuous therapy with ibrutinib, remissions are not durable for most patients, and prognosis is poor for patients who discontinue the drug, characterized by rapid relapse where patients experience more aggressive disease and overall survival as short as three months. Moreover, the proportion of patients electing to discontinue therapy with ibrutinib appears to be higher in community practice than reported in clinical trials, possibly due to intolerance for even low-grade toxicity as well as drug-related costs incurred by patients, who face the prospect of life-long therapy.

Breast cancer disease overview

Breast cancer is the most common type of invasive cancer among women and the second leading cause of cancer deaths among women. There are approximately 266,000 new diagnoses and 41,000 breast cancer deaths in the United States each year, and 12.4% of women will develop breast cancer in their lifetime. The Centers for Disease Control and Prevention, or CDC, estimates that there are approximately one million women in the United States living with breast cancer that has been diagnosed within the past five years.

Breast cancers can be segregated into subtypes based upon the presence of three protein receptors:

- estrogen receptor, or ER
- progesterone receptor, or PR
- human epidermal growth factor receptor 2, or HER2

Therapies have been developed that target tumors containing one or more of these receptors. Approximately 15% to 20% of breast cancers, however, do not express any of these three receptors and are referred to as triple-negative breast cancers ("TNBC"). These tumors have a more aggressive phenotype and a poorer prognosis due to the high propensity for metastatic progression and absence of specific targeted treatments. The only approved targeted therapy for TNBC is olaparib, marketed as Lynparza by AstraZeneca, for the small minority of patients with mutations in the BRCA1 or BRCA2 genes. The five-year survival for non-TNBC has been reported to be 80.8% but only 62.1% for TNBC.

One hypothesis for the high rate of metastasis and poor response to chemotherapy with TNBC is that these tumors contain a high number of tumor-initiating cells, or cancer stem cells, that are highly migratory and insensitive to standard chemotherapy.

Clinical Development Program

Cirmtuzumab Phase 1a clinical trial for potential treatment of CLL

A Phase 1a dose escalation trial of cirmtuzumab funded jointly by CIRM and Oncternal was conducted in 26 patients with actively progressing CLL who had relapsed or refractory disease. All patients had previously received treatment with any of several potential anti-CD20 monoclonal antibodies. Analysis of blood samples from these patients showed significantly higher plasma levels of Wnt5a compared to healthy matched controls and they also had higher levels of expression of ROR1 on their CLL cells.

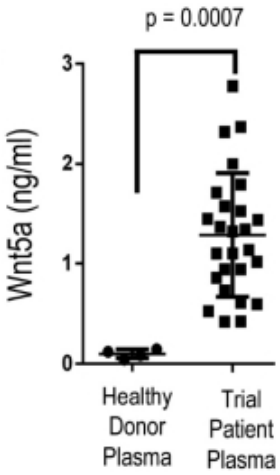


Figure 4. Wnt5a was overexpressed in all CLL patients enrolled in the cirmtuzumab Phase 1a clinical trial

Patients were treated with four doses of cirmtuzumab administered every two weeks, in cohorts of three receiving escalating doses from 0.16 to 20 mg/kg/dose. Patients receiving doses of cirmtuzumab of 2 mg/kg or greater had a 33% reduction in ROR1 expression relative to baseline. To assess the levels of activation of ROR1, CLL cells from patients in the 16 mg/kg cohort were analyzed for levels of phosphorylated hematopoietic-lineage-cell-specific protein 1 (“HS1”), a direct target of activated ROR1. The ratio of phosphorylated HS1 to unphosphorylated HS1 dropped within 24 hours of dosing and remained low for several months, at which time the levels of cirmtuzumab in the bloodstream had become undetectable. These results provide evidence that the higher doses of cirmtuzumab administered to patients were sufficient to block the endogenous Wnt5a signaling and ROR1 activation in their CLL cells.

An analysis of genes expressed in CLL cells from treated patients was found to negatively correlate with gene signatures associated with stem cells and oncogenic dedifferentiation. In this analysis, called a gene set enrichment analysis ("GSEA"), changes in gene expression of thousands of genes are compared to those from reference cells with particular phenotypes. Individual genes are ranked by how strongly their expression correlates with the phenotype. When compared to baseline, cells from cirmtuzumab treated patients showed a reversal in the enrichment for genes that were identified as being the most highly correlated with stem cells and oncogenic differentiation.

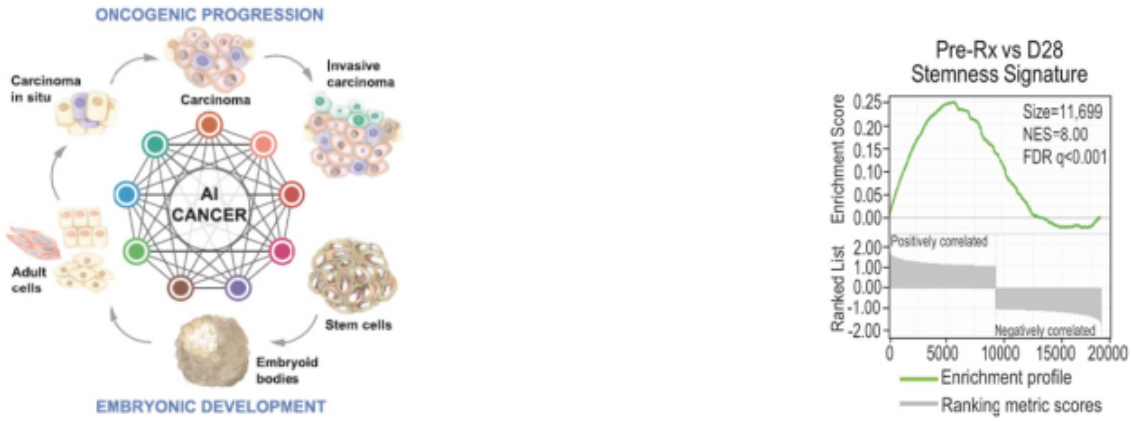


Figure 5. Reversal of GSEA signature for stemness observed in CLL cells from Cirmtuzumab treated patients

These results are consistent with preclinical observations that cirmtuzumab and ROR1 inhibition drive cells away from a stem-cell like profile. Cancer cells with stem-cell like profiles have the potential for self-renewal and are more likely to result in disease progression and poor prognosis due to resistance to therapy. Oncternal believes that the potential of cirmtuzumab to reverse these stem cell properties may lead to anti-tumor effects, including sensitizing tumors to other therapies.

In the clinical trial, seventeen patients had stable disease and five had progressive disease. Three of the patients with progressive disease had received the lowest dose of cirmtuzumab. Most patients experienced reductions in their leukemic lymphocyte counts and were able to delay initiation of further treatments for an average of 262 days, at which point plasma levels of cirmtuzumab were undetectable.

Cirmtuzumab infusions were generally well tolerated. Pharmacokinetic analyses indicated a long half-life of cirmtuzumab, over 30 days. There were no dose-limiting toxicities, no serious adverse events, and no discontinuations related to adverse events. The main laboratory findings included anemia, thrombocytopenia and neutropenia which were primarily attributed to the underlying CLL. Three patients enrolled in an extension arm of this trial continued to receive cirmtuzumab every two weeks for additional 3, 7 and 16 doses with no additional adverse events.

Cirmtuzumab in combination with ibrutinib for potential treatment of CLL and MCL

Oncternal and UC San Diego are conducting a Phase 1b/2 trial of cirmtuzumab in combination with ibrutinib in CLL patients and previously treated MCL patients who have not previously received ibrutinib or other forms of BTK therapy. Part 1 of this trial, which has been completed, was a dose-finding arm designed to determine the recommended dose of cirmtuzumab to be used in combination with ibrutinib. Part 2 of this trial, which is now enrolling, is a dose expansion trial where approximately 12 patients will be treated with cirmtuzumab administered every two weeks for the first month, then every four weeks afterwards, while ibrutinib is

administered daily. In Part 3 of this trial, approximately 90 additional patients will be randomized to receive cirmtuzumab plus ibrutinib or ibrutinib as monotherapy. The primary endpoint of Part 3 of this trial is to determine the CR rate. The data which are emerging from this trial will be used to determine the company's regulatory strategy, including whether the company will seek regulatory approval through standard review or an accelerated approval pathway. This trial is co-sponsored by UC San Diego with support from CIRM.

The rationale for this trial is two-fold. First, ibrutinib is emerging as a leading therapy for both CLL and MCL. Despite its efficacy in extending progression-free survival, ibrutinib does not provide the majority of patients with a CR even after prolonged dosing. Therefore, the company believes there is an opportunity for improving efficacy by dosing ibrutinib in combination with another agent. Secondly, *in vivo* studies conducted in mouse CLL models have shown that ibrutinib and cirmtuzumab exerted their antitumor activities through independent pathways; that is, inhibition of BTK by ibrutinib did not alter ROR1 signaling nor did it impair the rate at which cirmtuzumab blocked ROR1 signaling. The combination of both drugs reduced the size of the spleen, the primary site of leukemic disease in these mice, as well as the number of CLL cells in these spleens.

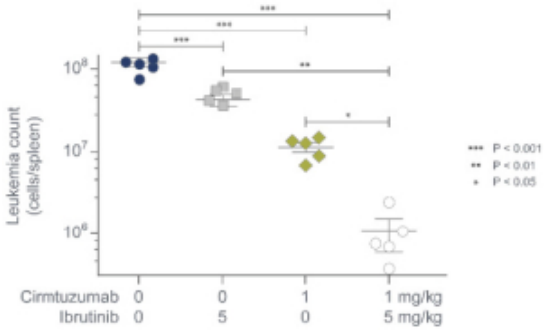


Figure 6. Combined administration of cirmtuzumab and ibrutinib reduced leukemic cell count in the spleen in a mouse model of CLL.

The ongoing Phase 1b/2 is an open-label trial and as of March 2019 Oncternal has already observed several clinical responses with one confirmed CR in a patient with MCL and one confirmed CR in a patient with CLL. In one case, a patient with MCL who had relapsed following high-dose chemotherapy and allogeneic stem cell transplant was treated with the combination of cirmtuzumab plus ibrutinib. The primary tumor in this patient, which was measured at 9 cm x 6.7 cm at baseline, rapidly shrank and was undetectable at three months of treatment with the cirmtuzumab/ibrutinib combination. The CR was confirmed at seven months and 10 months of combination treatment. In a CLL patient who enrolled in the trial after relapsing from chemoimmunotherapy, the combination of cirmtuzumab and ibrutinib led to normalization of lymph node size and lymphocyte counts by 10 months of combination treatment, and there was no evidence of CLL upon histologic examination of the bone marrow. As of March 2019, CLL patients in this trial have obtained an 80% average reduction in lymph node size in 24 weeks.

Cirmtuzumab in combination with paclitaxel for potential treatment of metastatic breast cancer

A single arm, open-label, Phase 1b trial of cirmtuzumab in combination with paclitaxel has been initiated by an investigator at UC San Diego. The Phase 1b trial will enroll up to 20 patients with Her2 negative, metastatic or locally advanced, unresectable breast cancer. Patients in this trial will receive a fixed dose of cirmtuzumab every other week for two doses then once every four weeks. The patients will also receive standard of care paclitaxel dosed weekly starting on day 1.

Approximately 75% of breast tumors express ROR1, and TNBC patients with high levels of ROR1 have a substantially significantly reduced survival rate compared to those with low levels.

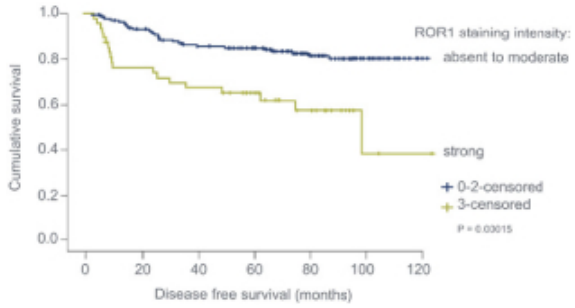


Figure 7. TNBC patients with high levels of ROR1 expression had lower disease-free survival

A retrospective, long-term analysis of 582 breast cancer patients who had their tumors removed showed that those with tumors expressing high levels of ROR1 were at a statistically significantly higher risk of developing metastases within the first several years. Over 60% of patients with high ROR1 developed metastases compared to only 35% of patients with the lowest levels of ROR1.

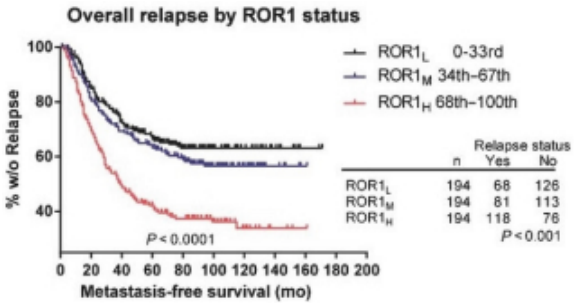


Figure 8. High levels of ROR1 in breast cancer was associated with shorter metastasis-free survival

Preclinical experiments have shown that treatment of breast tumors with paclitaxel increased the percentage of cells with high levels of ROR1. In these experiments, immunodeficient mice were implanted with primary human breast tumors then treated with paclitaxel. While paclitaxel either slowed tumor growth or reduced the size of tumors in these mice, the surviving cells were enriched for expression of ROR1.

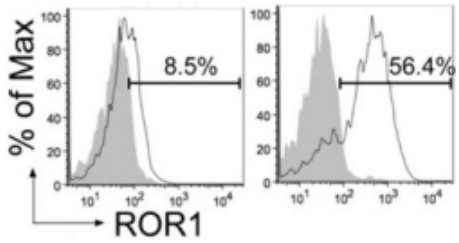


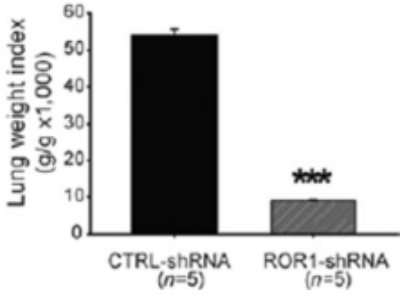
Figure 9. Breast tumors treated with paclitaxel showed elevated levels of ROR1 expression

This increased expression of ROR1 was also associated with a shift in the properties of cells from these tumors towards a more metastatic and more tumorigenic phenotype. Cells from tumors that had been treated with paclitaxel were more likely to form spheroids in tissue culture, and were enriched for cells with the ability to form new tumors when transplanted, both properties that are correlated with tumor aggressiveness.

Together, these clinical and preclinical data are consistent with a model of the natural disease progression in TNBC centered on the critical role played by tumor-initiating cells or stem-like cancer cells that express high levels of ROR1.

- TNBC is initially responsive to chemotherapy such as paclitaxel, because chemotherapy kills the majority of cancer cells, leaving cells with stem-like properties that express ROR1.
- TNBC returns more often than other types of breast cancer in part because the initial chemotherapy enriches for cells with a higher propensity to form tumors.
- The site of recurrence is often at another place in the body than the original tumor because cells with stem cell-like properties are able to metastasize.
- The recurring tumor may be resistant to therapy because it contains a high percentage of cells with stem cell-like properties.

Preclinical experiments in an MDA-MD-231 TNBC model in mice provided evidence that reductions in ROR1 can limit metastases and improve overall survival. In this model, ROR1 levels were selectively reduced using a genetic construct that delivers a short-hairpin RNA, or shRNA, that is designed to prevent ROR1 protein from being produced. Inhibition of ROR1 production resulted in significantly fewer cancer cells that have metastasized to the lungs.



***, P < 0.001

Figure 10. Suppression of ROR1 led to fewer metastases to the lungs in an MDA-MD-231 model TNBC model

Inhibition of ROR1 production in these mice also improved overall survival to a mean of approximately 43 days compared to 30 days for mice containing control shRNA.

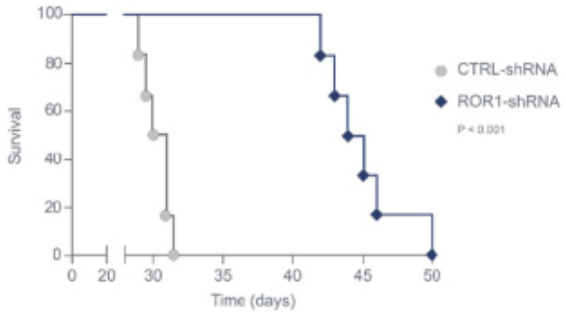


Figure 11. Inhibition of ROR1 expression led to improved survival in an MDA-MD-231 TNBC model.

Cirmtuzumab reduced the growth rate of primary human breast cancers in immunodeficient mice and led to complete suppression of tumor growth for twenty days when used in combination with paclitaxel. Even after tumors did eventually grow, they lacked the ability to form new tumors. All tumor samples isolated from control mice and most of the tumor samples from cirmtuzumab-treated or paclitaxel-treated mice were able to establish new tumors when transplanted into other mice. No tumors, however, were formed when equal numbers of tumor cells from mice treated with the combination of cirmtuzumab and paclitaxel were introduced into other mice.

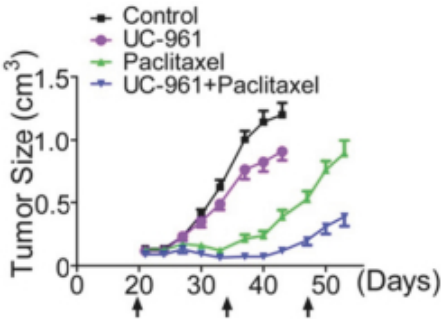


Figure 12. Combination of cirmtuzumab and paclitaxel suppressed growth of primary human breast tumors in a mouse model

Additional clinical opportunities

ROR1 is expressed by 75% of lung cancers and by 93% of lung adenocarcinomas. In adenocarcinoma of the lung, patients at advanced stages and those with positive lymph node metastasis expressed higher level of ROR1, which was correlated to stage and lymph node metastasis. Kaplan-Meier survival analysis indicated an association of high ROR1 expression with worse overall survival in lung adenocarcinoma patients that was independent of lymph node status. ROR1 expression has been shown to be correlated with the presence of other negative prognostic factors such as phosphorylated AKT (“p-AKT”), or phosphorylated CREB (“p-CREB”) Inhibition of ROR1 in lung cancer cell lines induced apoptosis and cell cycle arrest and led to a reduction in levels of p-CREB and p-AKT.

ROR1 is expressed by 90% of prostate cancers and the Wnt5a signaling pathway is activated in patients with advanced prostate cancer that is progressing while on treatment with an androgen receptor, or AR, inhibitor. Treatment of prostate cancer cell lines with an AR inhibitor was found to increase the expression of Wnt5a, and the addition of Wnt5a attenuated the antiproliferative effect of AR inhibition. The expression of Wnt5a in patients with metastatic castrate resistant prostate cancer, or mCRPC, has been associated with poor overall survival. Oncternal is collaborating with UC San Diego to investigate the potential effects of cirmtuzumab on this disease.

TK216

TK216 is an investigational, potentially first-in-class small molecule that is designed to inhibit the biological activity of E26 transformation-specific ("ETS"), transcription factor oncoproteins. TK216 is being evaluated alone and in combination with vincristine in a Phase 1 clinical trial in patients with relapsed or refractory Ewing sarcoma, a rare pediatric cancer that has historically been very challenging to treat effectively.

Scientific Background

TK216 is an investigational, potentially first-in-class small molecule inhibitor of a set of cancer-related proteins known to be associated with both solid tumors and hematological malignancies. In some tumors, the target for TK216 is a fusion protein that arises from chromosomal translocation. Fusion proteins are a well-known category of targets for small molecule cancer therapy that have been cited in the scientific literature as providing a number of diagnostic and therapeutic advantages because of their tumor-specific expression.

TK216 targets the ETS family of oncoproteins. The association of these transcription factors with cancer is related both to their fusion with other proteins to create potent oncogenes and to their overexpression in cancer cells, either of which may drive overabundant or aberrant cell growth. Fused or overexpressed transcription factors in this family have been identified in multiple tumors including solid tumors such as Ewing sarcoma and prostate cancer, as well as in hematological malignancies such as AML and diffuse large B cell lymphoma ("DLBCL"). Fusions of ETS family members have been shown to be critical to the onset and development of cancer.

TK216 has been observed to inhibit the interaction between ETS family members and RNA helicase A or RHA, a critical component of the human transcriptional complex, and by doing so, shut down excessive cell proliferation in preclinical tumor models.

ETS transcription factors and oncogenesis

In normal development and physiology, ETS transcription factors govern processes such as cell cycle control, differentiation, proliferation, apoptosis, tissue remodeling and angiogenesis. These processes play a key role in normal cell functioning, and when mutation-driven disruptions in the functions of ETS factors develop, they have been shown to lead to tumor initiation, progression, and metastasis.

Fusion proteins involving ETS factors have been implicated in various solid tumors, including Ewing sarcoma and prostate cancer. For example, approximately 85% of Ewing sarcomas contain a genomic rearrangement between chromosomes 11 and 22. DNA is exchanged between these chromosomes in a pathological manner, and this exchange results in a fusion of two genes: the FLI1 gene, an ETS family member, and the EWSR1 gene, an unrelated transcription factor. This gene fusion, known as EWS/FLI, functions as a transcription activator that is no longer controlled by the relevant regulatory machinery in the cell. In addition to escaping regulation, the dysregulated function of the EWS/FLI fusion causes a series of abnormalities in RNA processing including aberrant mRNA splicing, where it leads to defects in the synthesis of proteins such as BRCA1, a DNA repair protein. EWS/FLI fusions also cause the formation of abnormal and potentially deleterious DNA and RNA structures known as R-loops that are associated with replication and transcriptional blocks as well as being prone to increased DNA damage.

Multiple other tumors contain gene fusions of other ETS factors. For example, over 50% of metastatic prostate cancers carry the TMPRSS2-ETS fusion. Other tumors have genetic changes that result in overexpression of ETS factors.

ETS Fusion Proteins	ETS Overexpression

• Ewing sarcoma
  • EWS-FLI1
• Prostate cancer
  • TMPRSS2-ERG
• AML
  • ETV6-various (20+)
• ALL
  • ETV6-RUNX1
• Secretory breast cancer
  • ETV6-NTRK3
	• AML
	  • FLI1, ERG, ETV5, ETS2
	• DLBCL
	  • ETV1, FLI1, ETV4, SPIB
	• Prostate cancer
	  • ERG, ETV1, ETV4, ETV6
	• Lung cancer
	  • ETV5, ETV1, FLI1, ETS1
	• Breast cancer
	  • ETV6, ETV4, SPIB, ETV5

The ETS family member ERG is overexpressed in many cancers, such as AML, with no obvious correlation between the levels of ERG and the presence of other known tumorigenic mutations. In a retrospective analysis of patients with breast cancer followed for up to 20 years following diagnosis, the quartile of patients with the highest levels of ERG expression had a significantly higher rate of relapse and poorer overall survival than patients with lower levels of ERG expression. Those with the highest levels of ERG had a five-year survival rate of 20% while those with lower levels had a survival rate of approximately 50%. Similarly, AML patients with high levels of ETS2, another ETS family member, had a significantly lower five-year survival rate of approximately 15% compared to 40% for patients with lower levels.

Figure 13. Survival of the quartile of AML patients with the highest ERG (left) or ETS2 (right) expression was significantly lower than those with lower expression.

Despite the genetic associations between ETS factors and tumorigenesis and the strong correlation between high levels of ETS factor expression and survival, there are currently no therapeutics available that target these factors. It had been widely considered that transcription factors are difficult to target due to their non-enzymatic mechanism of action, so the company believe the approach of inhibiting protein-protein interactions is novel. Oncternal believes that a product candidate targeting ETS factors could fill an important gap in the treatment landscape for both solid tumors and hematological malignancies.

Ewing sarcoma disease overview

Ewing sarcoma is the second most common bone tumor of children that occurs most often in adolescents and accounts for approximately 2% of all childhood cancer diagnoses. Ewing sarcoma is part of a spectrum of tumors known as Ewing sarcoma family of tumors which also includes peripheral primitive neuroectodermal tumor. Approximately 750-950 people are diagnosed with Ewing sarcoma each year in the United States.

Ewing sarcoma typically develops in the pelvis, femur, and bones of the head and trunk, but its diagnosis often takes months as other causes for non-specific symptoms such as localized pain, fever, fatigue, weight loss, or

anemia are ruled out. The five-year survival of patients who are diagnosed with non-metastatic disease is between 50% and 70%. Patients diagnosed with metastatic disease have five-year survival between 18% and 30%.

Ewing sarcoma is usually treated systemically due to the fact that local treatments, even in patients without overt metastases, have an 80% to 90% relapse rate. The current standard therapy for patients with localized Ewing sarcoma in the United States is a combination of chemotherapy agents, including vincristine, doxorubicin and cyclophosphamide, with alternating cycles of ifosfamide and etoposide – a therapy known as VDC/IE. Patients that respond to this therapy may be candidates for tumor resection and continued treatment for a total of 14 to 17 cycles. This therapeutic regimen, however, is associated with significant toxicities. Patients with metastatic disease are often treated with VDC/IE or variations of this therapy with higher or more compressed dosing. This may also be supplemented by local radiation therapy or systemic radiation followed by autologous hematopoietic stem cell transplant. Oncternal believes that more effective therapies are needed for this rare pediatric disease.

AML disease overview

AML is a hematologic malignancy characterized by dysregulated maturation of myeloid or blood stem cells and failure of the bone marrow to properly function. Myeloid cells normally differentiate into mature red blood cells, white blood cells, and platelets, however in AML, this maturation process does not progress normally. As a result, an overabundance of immature leukemia cells accumulates in the blood, replacing healthy mature cells, leaving patients with anemia and immune deficiency, and at high risk of infections and bleeding.

AML is the most common type of acute leukemia in adults. Approximately 19,500 new AML cases and 10,670 AML associated deaths occur annually in the United States. The average age of an AML patient is 68 years. The National Cancer Institute estimated in 2018 that the five-year survival rate for adult patients with AML was approximately 27%.

First-line therapy for AML patients is high dose chemotherapy usually consisting of cytarabine plus an anthracycline such as daunorubicin, a therapeutic regimen that has changed little in the past 40 years. This intensive chemotherapy treatment is associated with a treatment related mortality rate of approximately 10%. Patients who are older or in poor health are treated with cocktails of various other chemotherapy agents at doses they can tolerate. Two therapies have recently been approved by the FDA for the treatment of AML in elderly patients who are not candidates for intensive chemotherapy due to their health condition. Glasdegib, marketed as Daurismo by Pfizer, is an inhibitor of the hedgehog signaling pathway that was shown to increase overall survival to 8.3 months when given with low dose cytarabine compared to 4.3 months for low dose cytarabine alone. Venetoclax, marketed as Venclexta by Abbott, was approved based on the ability to induce CR in a subset of patients that lasted for five to six months. Other therapies such as ivosidenib, marketed as Tibsovo by Agios, enasidenib, marketed as Idhifa by Celgene, and gilteritibin, marketed as Xospata by Astellas, have been approved for subsets of AML patients with specific genetic mutations.

Between 20% and 30% of young adult patients and 50% of older patients are refractory to initial treatment and many others who initially respond suffer relapses of their disease. Options for second-line therapy for these patients are limited. The only potential curative therapy for AML is allogeneic hematopoietic stem cell transplantation where the patient’s AML and entire immune system are eliminated by high dose chemotherapy and/or radiation and replaced with stem cells isolated from a compatible healthy donor. However, up to 55% of these patients’ relapse, with median survival after relapse of approximately five months. The average two-year survival after relapse is 20%. The rigorous conditioning regimen required for stem cell transplants limit this option to younger and healthier patients. Therefore, there is a clear need for more effective and less toxic therapies for AML.

Preclinical data

TK216 is a more potent derivative of a research compound, YK-4-279, that was identified through screening for molecules that bind to the EWS/FLI fusion protein and prevent its interaction with RNA Helicase A, or RHA.

Previous studies had shown that the interaction between EWS/FLI and RHA was essential for *in vitro* proliferation and formation of cell colonies in an EWS/FLI dependent cell line.

EWS/FLI and other ETS family members function as transcriptional regulators. They function by directing the assembly of a complex of other proteins on DNA templates which carry out the process of transcription of the DNA sequence into mRNA transcripts. These complexes include RNA polymerase II, cyclic AMP response element-binding protein, and RHA. Disruption of this complex inhibits transcription, leading to inhibition of the oncogenic activity of EWS/FLI.

When added to cells, YK-4-279 inhibited proliferation of EWS/FLI dependent cells but had no effect on the proliferation of control cell lines. When dosed in a CHP-100 xenograft model of Ewing sarcoma, YK-4-279 resulted in marked inhibition of tumor growth. Subsequent studies have identified anti-tumor activity in a variety of tumors including neuroblastoma, prostate cancer, and AML. TK216 is a structural analog of YK-4-279 that has shown increased potency in biochemical, cellular and xenograft tumor models.

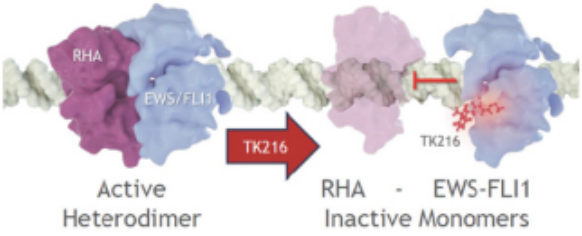


Figure 14. Model depicting the inhibition of the interaction of EWS/FLI1 and RHA

TK216 was designed to inhibit the physical interaction between RHA and EWS/FLI in cells. In preclinical studies, RHA was found to be physically associated with EWS/FLI in Ewing sarcoma cells, but the two proteins were no longer bound together if the cells had been incubated with TK216.

Treatment *in vitro* with TK216 led to dose-dependent inhibition of transcription from a luciferase reporter assay in COS7 cells. TK216 also inhibited proliferation of Ewing sarcoma cell line A4573.

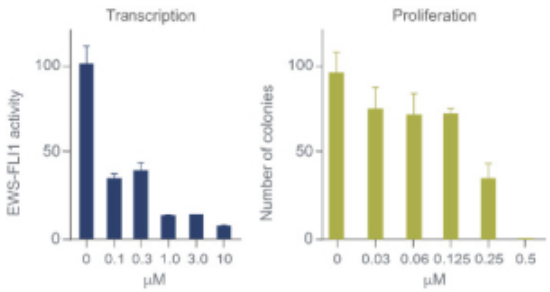


Figure 15. TK216 inhibited transcription of a reporter gene dependent on EWS/FLI (left). TK216 inhibited proliferation of a Ewing sarcoma cell line A4573 (right)

Treatment of mice bearing xenografts of the TMD-8 DLBCL cell line with 100 mg/kg of TK216 led to a 77% reduction in tumor growth over thirteen days of treatment. Histology of tumor samples isolated after treatment showed reductions in Ki67, a cellular marker of proliferation, and increases in the level of cleaved caspase 3, a marker of apoptosis.

TK216 has inhibited proliferation of multiple cell lines containing EWS/FLI fusions, as well as other cell lines containing other ETS translocations or overexpressing ETS factors. These results suggest that TK216 bound to a site that is commonly used by multiple ETS family members to interact with other factors such as RHA and therefore the company believes that TK216 has potential beyond targeting the EWS/FLI fusion that is commonly found in Ewing sarcoma.

Treatment of aggressive tumors such as Ewing sarcoma typically requires a combination of agents. A systematic analysis combining approved agents tested in combination with YK-4-279, an analogue of TK216, was conducted using Ewing sarcoma cell lines. YK-4-279 led to synergistic cytotoxicity with 28% of the agents tested including antimetabolites, nucleic acid synthesis inhibitors, immunosuppressive or immunomodulating agents and microtubule inhibitors. One of these agents was vincristine, a mainstay of treatment for Ewing sarcoma, a tumor where 85% of patients have an EWS/FLI fusion protein. *In vivo* activity in an A4573 xenograft model of Ewing sarcoma showed tumor shrinkage and increased survival when YK-4-279 was combined with vincristine.

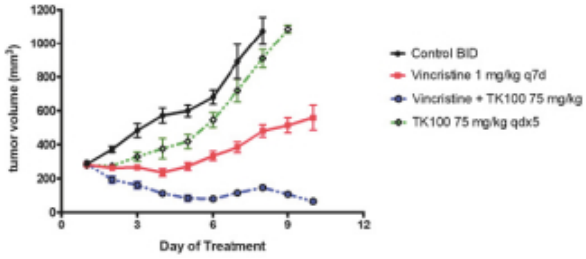


Figure 16. Combination of YK-4-279 and vincristine resulted in tumor shrinkage and prolonged survival in an A4573 model of Ewing sarcoma

Clinical Development Program

TK216 in combination with vincristine for potential treatment for Ewing sarcoma

Oncternal is conducting an open-label dose escalation Phase 1 trial of TK216 in Ewing sarcoma patients that have relapsed or are refractory to current therapies. In the first part of this trial, TK216 is being is administered for seven days as a continuous infusion repeated every three weeks. Twenty-nine patients have been treated, and data collected as of March 2019 have identified dose-limiting neutropenia, or a low level of white blood cells, at a dose of 288 mg/m^2/day, and 220 mg/m^2/day has been determined as the maximum tolerated dose. Additional cohorts are now being recruited that extend the dosing period for TK216 from seven days to ten and fourteen days. Patients in these cohorts may also receive vincristine. Once a recommended Phase 2 dose is identified, a cohort of patients will receive the recommended Phase 2 dose of TK216 combined with vincristine.

TK216 as a potential treatment for AML

In partnership with M.D. Anderson Cancer Center, Oncternal is planning to initiate a Phase 1 trial in relapsed and refractory AML patients, a patient population known to express in certain cases fusion proteins involving ETV6, and to have overexpression of ETS family members including FLI1, ERG, ETS2, and ETV5.

ROR1 CAR-T

Oncternal is developing a chimeric antigen receptor T cell, or CAR-T therapy based on the ROR1 binding domain of cirmtuzumab to treat patients with aggressive hematological malignancies or solid tumors. The company believes that the selective expression of ROR1 on tumor cells and its absence on normal cells make it an ideal target for a CAR-T approach. In addition, the company believes that the survival benefit imparted on

cancer cells expressing ROR1 will limit the development of ROR1-negative resistant tumors, and that tumors that generate mutations that escape an ROR1 CAR-T therapeutic by inactivating or suppressing ROR1 would lose their stem cell-like properties, limiting their ability to metastasize or establish new tumors. Oncternal's ROR1 targeted CAR-T therapy is in preclinical development at UC San Diego, with funding from the CIRM.

Scientific Background

CAR-T cell therapy overview

Immuno-oncology describes the concept of using the patient's own immune system to attack cancer. It has been widely recognized that this approach, by specifically killing cancer cells without harming healthy cells and tissues, can overcome some of the most undesirable side effects of standard cancer therapies such as chemotherapy and radiation.

Immuno-oncology redirects one of the pillars of the immune system, the adaptive immune system, so that it specifically and efficaciously recognizes not only pathogens and other threats to the body but also cancerous cells that might previously have escaped immune recognition. A key element in the adaptive immune response is the T cell. T cells are white blood cells that can recognize and kill infected and abnormal cells. T cells also act to signal other immune cells to respond to threats. T cells recognize their targets because they are created in a way that allows them to specifically recognize foreign antigens on the surface of other cells.

T cells are ideally suited for immuno-oncology applications based on several characteristics. They are created to be exquisitely specific and avid killers. One T cell can eliminate numerous target cells. T cells are extremely specific, able to recognize an infected cell and kill it while ignoring an almost identical yet uninfected healthy cell. T cells are thought to be active all the time, eliminating cancer cells from the body before they can form tumors. However, tumor cells sometimes evolve to escape killing by T cells by activating a number of pathways that suppress T cell function. Taking this concept one step further by modifying the T cell to kill cancer cells selectively despite these built-in defenses represents the basic idea behind CAR-T therapies.

CAR-T therapeutics are created by isolating T cells from patients and modifying them to recognize specific antigens on tumors. T cells have potent cell killing activity that is directed to target cells that are recognized by specific T cell receptors ("TCRs"), that are expressed on the surface of these T cells. While some T cells have TCRs that can recognize cancer cells leading to their killing, potent T cells do not develop to all targets. In some cases, the potential cancer cell target is also a protein that has an essential role in other tissues or at other stages of development and TCRs that recognize these targets are eliminated during the normal T cell development.

CAR-T therapy has emerged as a way to engineer T cells to recognize specific targets, such as those that are selectively expressed on cancer cells. A gene encoding a chimeric protein is constructed that contains a single antigen-binding domain of an antibody that recognizes the target coupled to a T cell costimulatory domain and a portion of the T cell receptor.

CAR-T therapies are typically produced from a patient's own T cells which are isolated by leukapheresis. These cells are then genetically modified with the chimeric antigen gene construct which can be delivered by various mechanisms such as lentiviral gene delivery vectors. Transduced cells are then expanded and undergo quality testing before being reintroduced into the same patient.

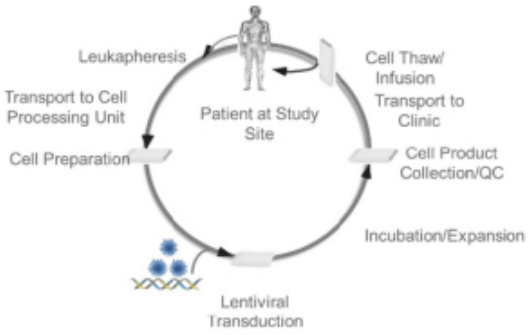


Figure 17. CAR-T production and patient treatment

Two CAR-T cell therapies, Yescarta, developed by Kite Pharma, and Kymriah, developed by Novartis, have been approved by the FDA. Both of these therapies target the CD19 protein, a protein expressed on the surface of the majority of B cells, including B cell tumorigenic cells. Yescarta has been approved for the treatment of relapsed or refractory large B-cell lymphoma and Kymriah for the treatment of relapsed or refractory B-cell precursor acute lymphoblastic leukemia. These therapies have received breakthrough designations from the FDA and have shown high response rates with prolonged treatment effects for a subset of patients. No CAR-T therapies have been approved for use in patients with solid tumors. Despite the high response rates and prolonged treatment effects observed for a subset of patients, Oncternal believes that novel CAR-T approaches have the potential to improve efficacy, duration of response as well as safety.

ROR1 CAR-T

Oncternal's CAR-T program is based on a collaboration with UC San Diego, with support from CIRM. Genetic constructs are being designed and tested that incorporate the following elements: (1) a single chain variable region ("ScFv") based on the cirmtuzumab antibody and with high affinity for ROR1, (2) a hinge and spacer region derived from CD4 or CD8, (3) a transmembrane domain, (4) an intracellular costimulatory domain comprised of CD28 and/or 4-1BB, and (5) the CD3 z. activating domain. This construct is designed to be delivered into T cells using a lentivirus transduction system.

Various permutations of the five elements of the ROR1 targeting construct have been tested, and the design of the construct is nearly finalized. Batches of lentivirus can be produced that carry the construct, and T cells can be transfected and shown to express the construct. In *in vitro* assays, ROR1 targeting CAR-T cells killed tumor target cells expressing while relatively sparing target cells not expressing ROR1.

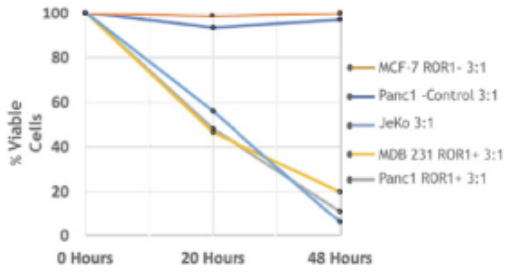


Figure 18. Killing of tumor cells from cell lines derived from breast and pancreatic cancers in an *in vitro* assay with ROR1 CAR-T was dependent on ROR1 expression

Oncternal also plans to collaborate with its strategic partner, Shanghai Pharmaceuticals Holding Co., Ltd. ("SPH"), for its CAR-T program. Through its US subsidiary SPH USA, SPH has entered into the SPH USA License Agreement with Oncternal to develop ROR1 targeted CAR-T products in greater China. Oncternal plans to collaborate with SPH to develop processes to produce and manufacture lentiviruses carrying the ROR1 construct. This represents a potential advantage for the Oncternal CAR-T program, because viral manufacturing capacity is constrained in the US and EU, and some CAR-T developers are experiencing delays in their CAR-T programs caused by the limited manufacturing capacity. Oncternal and SPH also intend to collaborate by conducting one or more clinical trials of its potential CAR-T product candidate in China at hospitals in China that are known to SPH and that have substantial experience processing cellular immunotherapy materials, and substantial experience conducting CAR-T clinical trials. Initial clinical trials of the Oncternal CAR-T program may occur in the United States at UC San Diego and at sites in China.

Licenses and Collaborative Relationships

UC San Diego

In March 2016, Oncternal entered into a license agreement with the Regents, represented by UC San Diego, which was amended and restated in August 2018, for the development, manufacturing and distribution rights to naked antibodies, including cirmtuzumab and genetically engineered cellular therapy products, including CAR-T products that are covered by licensed patents for all human therapeutic, diagnostic and preventive applications in all indications. Under the license agreement with UC San Diego (the "UC San Diego License Agreement"), the company paid an upfront license fee of $500,000 and issued 1,459,524 shares of common stock shares of common stock. Commencing in 2017, Oncternal also pays UC San Diego an annual license maintenance fee and reimburses to UC San Diego its annual patent costs for the licensed patents. The UC San Diego License Agreement also requires the payment of certain development and regulatory milestones, aggregating from $10.0 million to $12.5 million, on a per product basis, certain worldwide sales milestones based on achievement of tiered revenue levels aggregating $75.0 million, low single-digit royalties including potential future minimum annual royalties on net sales of each product, and requires certain minimum diligence efforts to advance the licensed assets, including spending at least $1.0 million in development annually through 2023. Unless terminated earlier, the UC San Diego License Agreement will expire upon the later of the expiration date of the longest-lived patent rights or the 15th anniversary of the first commercial sale of a licensed product. UC San Diego may terminate the UC San Diego License Agreement if a material breach by Oncternal is not cured within a reasonable time, the company files a claim asserting the licensed patent rights are invalid or unenforceable, or the company files for bankruptcy. Oncternal may terminate the agreement at any time upon at least 90 days' written notice. In July 2016, Oncternal entered into a research agreement with UC San Diego (the "UC San Diego Research Agreement"), for further research on the ROR1 therapeutic development program. Under this five-year agreement, UC San Diego will have an aggregate budget of $3.6 million, with $125,000 payable quarterly. The costs paid to UC San Diego under the UC San Diego Research Agreement are included as part of the Company's annual diligence obligations under the UC San Diego license agreement.

CIRM

In August 2017, CIRM awarded an $18.3 million grant to researchers at UC San Diego to advance Oncternal's Phase 1b/2 clinical trial evaluating cirmtuzumab in combination with ibrutinib for the treatment of patients with B-cell lymphoid malignancies, including MCL and CLL. The trial is being conducted in collaboration between Oncternal and UC San Diego, with Oncternal responsible for study conduct and data management. Oncternal estimates it will receive $16.1 million in development milestones under research subaward agreements throughout the award project period, which runs through March 31, 2022. Under the CIRM research subaward agreements, the company is committed to certain co-funding requirements, including providing UC San Diego with progress and financial update reports. The CIRM subaward does not bear a royalty payment commitment.

CIRM may suspend or permanently cease disbursements of funds under the research subaward agreements, or pursue other remedies as allowed by law, if CIRM determines that UC San Diego has not complied with the terms and conditions of the award, or if there are unexpected, substantial manufacturing failure leading to delayed enrollment in the clinical trial, failure to enroll the trial, or if FDA issues a clinical hold order with respect to the clinical trial.

Georgetown University

In March 2014, the Company entered into an exclusive license agreement (the "Georgetown License Agreement"), with Georgetown University, or Georgetown, pursuant to which Oncternal licensed the exclusive worldwide right to patents and technologies for the development and commercialization of certain product candidates targeting EWS-FLI1 as an anti-tumor therapy for therapeutic, diagnostics, or research tool purposes. Under the Georgetown License Agreement, the company is solely responsible for all development and commercialization activities and costs in its respective territories, and is also responsible for all costs related to the filing, prosecution and maintenance of the licensed patent rights. Commencing in 2015, the Company is obligated to pay Georgetown an annual license maintenance fee until the first commercial sale occurs, make up to $200,000 in aggregate milestone payments upon the achievement of certain regulatory milestones, and will be required to pay low single digit royalties based on annual net product sales. The term of the Georgetown License Agreement continues until the expiration of the last valid claim within the patent rights covering the product, but may be terminated by either party upon material breach, or by Oncternal as to one or more countries with 90 days written notice of termination. Additionally, Georgetown may terminate the agreement in the event the company fails to pay any amount and fails to cure such failure within 30 days after receipt of notice, defaults in its obligation to obtain and maintain insurance and fails to remedy such breach within 60 days after receipt of notice, or declares insolvency or bankruptcy. Oncternal may terminate the agreement at any time upon at least 60 days' written notice.

Shanghai Pharmaceutical (USA) Inc. ("SPH USA")

In November 2018, Oncternal entered into the SPH USA License Agreement, with SPH USA under which Oncternal granted exclusive rights to SPH USA to manufacture, develop, market, distribute and sell in the People's Republic of China, Hong Kong, Macau, and Taiwan (the "SPH USA Territory"), the company's product candidates under the Georgetown License Agreement and the UC San Diego License Agreement. Under the SPH USA License Agreement, SPH USA is solely responsible for all pre-clinical and clinical development activities specific to obtaining regulatory approval for such product candidates in the SPH USA Territory, any third-party license milestone or royalty payments owed under the Georgetown License Agreement and the UC San Diego License Agreement, and paying Oncternal a low single digit royalty on net sales of licensed products in the SPH USA Territory. The SPH USA License Agreement will expire on a licensed product-by-licensed product and country/region-by-country/region basis on the later of ten years from the date of first commercial sale or when there is no longer a valid patent claim covering such licensed product in such country/region. The Agreement may be terminated by SPH USA, on a country/region-by-country/region or product-by-product basis with 180 days written notice following the first anniversary of the effective date of the agreement or at any time on a product-by-product basis for a safety concern with respect to such product. Either party may terminate the Agreement in its entirety or on a licensed product-by-licensed product basis upon material breach that is not cured within 90 days, or in its entirety the event the other party becomes insolvent or enters into bankruptcy proceedings. Oncternal may terminate the agreement with 60 days written notice if SPH USA or its affiliates or sublicensees commence an action challenging the validity or enforceability of any licensed patent, or with 10 days written notice if SPH USA fails to own at least 20% of the voting securities of any assignee of the SPH USA License Agreement. Upon termination of the agreement for any reason all rights and licenses granted to SPH USA under the agreement will terminate, and in the event of termination for reasons other than Oncternal's material breach, SPH USA would grant Oncternal non- exclusive, royalty-free, worldwide license to any intellectual property rights controlled by SPH USA or its affiliates to exploit the terminated program in the SPH USA Territory.

Selexis S.A.

In May 2014, ROAR Therapeutics, Inc., a predecessor company of Oncternal, entered into a commercial license agreement (the "Selexis License Agreement"), with Selexis, S.A., a Swiss company, pursuant to which Oncternal obtained a world-wide, non-exclusive license under certain of Selexis' patents and technology rights to use a recombinant cell line produced using the Selexis technology to produce cirmtuzumab. Under the terms of the Selexis License Agreement, Oncternal will pay Selexis milestone payments totaling, in the aggregate, CHF 1,235,000, and a royalty in the low single digits on net sales of cirmtuzumab to third parties. The Selexis License Agreement remains in effect until the last to expire of the licensed Selexis patents, but may be terminated by either party if the other party materially breaches the agreement and fails to cure the breach within sixty days after receipt of a notice of default from the other party, or in the event the other party becomes insolvent or enters into bankruptcy proceedings. Additionally, Oncternal may terminate the Selexis License Agreement and the license granted therein at any time upon sixty days prior written notice to Selexis. In May 2015, Selexis' rights to receive future milestone payments and royalties under the Selexis License Agreement were assigned to Ligand Pharmaceuticals, Inc.

Manufacturing

Oncternal has adopted a manufacturing strategy of contracting with third parties in accordance with cGMP for the manufacture of drug substance and product, and additional manufacturers are used to label, package and distribute investigational drug products. This strategy allows Oncternal to maintain a more flexible infrastructure while focusing its expertise on developing its products.

Oncternal expects to continue to rely on third parties for the production of clinical and commercial quantities of any product candidates.

There are no complicated biochemistries or unusual equipment required in the manufacturing process for either cirmtuzumab or TK216.

Oncternal has established a quality control and quality assurance program, which includes a set of standard operating procedures and specifications designed to ensure that our products are manufactured in accordance with cGMPs, and other applicable domestic and foreign regulations.

Intellectual Property

Oncternal strives to protect and enhance the proprietary technology, inventions, and improvements that are commercially important to its business, including seeking, maintaining, and defending patent rights, whether developed internally or acquired or licensed from third parties. Oncternal's policy is to seek to protect its proprietary position by, among other methods, filing patent applications in the United States and in jurisdictions outside of the United States related to its proprietary technology, inventions, and improvements that are important to the development and implementation of its business. Oncternal also relies on trade secrets and know-how relating to its proprietary technology, continuing innovation, and acquisition and in-licensing opportunities to develop, strengthen, and maintain our proprietary position in the field of cancer therapeutics.

Oncternal's commercial success may depend in part on its ability to obtain and maintain patent and other proprietary protection for its technology, inventions, and improvements; to preserve the confidentiality of its trade secrets; to defend and enforce its proprietary rights, including its patents; and to operate without infringing on the valid and enforceable patents and other proprietary rights of third parties.

Oncternal has licensed and acquired numerous patents and patent applications and it possesses substantial know-how and trade secrets relating to the development and commercialization of healthcare products and services. As of March 31, 2019, Oncternal owned and in-licensed patent portfolio consisted of approximately 18

issued U.S. patents and eight pending U.S. patent applications related to certain of our proprietary technology, inventions, and improvements, and 24 issued patents and 86 pending patent applications in jurisdictions outside of the United States.

ROR1 Program

Oncternal has an exclusive, commercial, worldwide, transferrable license to a portfolio of patents and patent applications with rights to make, use, sell, offer for sale, and import ROR1 antibodies and CAR-T therapies for all therapeutic indications. This portfolio is licensed from the Regents. Oncternal has know-how and trade secrets related to compositions of matter for treating cancers, methods for treating cancer, and methods of screening for additional compositions of matter useful for treating cancer, as well as to additional antibodies and molecules that modulate ROR1 signaling.

As of March 31, 2019, Oncternal's licensed patent portfolio included patents related to its clinical candidate currently in phase 1/2 clinical trials, cirmtuzumab. Cirmtuzumab is a humanized monoclonal antibody that specifically binds to the ROR1 receptor. Oncternal has two issued U.S. patents directed to the cirmtuzumab composition of matter: U.S. Pat. No. 9,217,040, with a patent term not due to expire before 2032; and U.S. Patent No. 9,758,591, with a patent term not due to expire before March 2033. Oncternal has one patent application pending in the U.S. in this family related to methods of using cirmtuzumab to treat cancer. Oncternal also has patents issued in Australia, China, Europe, Japan, Korea and Mexico directed to the cirmtuzumab compositions of matter. Oncternal has approximately 14 pending applications in foreign jurisdictions related to cirmtuzumab composition of matter and methods of use in treating cancer, including Australia, Canada, China, Europe, Japan, Korea, Malaysia, Mexico, Philippines, and Thailand. Patents that issue from these pending foreign applications would not be due to expire before 2032.

As of March 31, 2019, Oncternal had patent applications pending in the U.S. and in 15 jurisdictions outside the U.S. related to methods of treating cancer using a combination of cirmtuzumab and small-molecule chemotherapeutics. Patents that issue from these pending applications would not be due to expire before 2037.

As of March 31, 2019, Oncternal had patents and patent applications related to additional ROR1 binding antibodies and chimeric antigen receptor T cells specific for ROR1. Oncternal had four issued U.S. patents directed to non-cirmtuzumab antibodies: U.S. Pat. No. 8,212,009, with a patent term not due to expire before November, 2026; U.S. Patent No. 9,242,014, with a patent term not due to expire before June 2031; U.S. Patent No. 9,938,350, with a patent term not due to expire before June 2031; and U.S. Patent No. 9,217,040, with a patent term not due to expire before January 2032. Oncternal had two patent applications pending in the U.S. related to additional non-cirmtuzumab ROR1 binding antibodies and non-cirmtuzumab chimeric antigen receptor T cells specific for ROR1. Oncternal also had patents issued in Europe and Canada directed to additional ROR1 binding antibodies. Oncternal had two patent applications pending in Europe and Canada related to additional ROR1 binding antibodies and chimeric antigen receptor T cells specific for ROR1. Patents that issue from these pending foreign applications would not be due to expire before 2031.

As of March 31, 2019, Oncternal had intellectual property related to methods of screening for antibodies that specifically bind to ROR1. Oncternal had two issued U.S. patents, U.S. Pat. Nos. 9,523,695, and 9,933,434, with patent terms not due to expire before January 2032, directed to methods of screening for antibodies that specifically bind to ROR1. Oncternal additionally has patent applications pending directed to methods of screening for modulators of ROR1 signaling in jurisdictions including the U.S., Australia, Canada, China, Hong Kong, Japan, and Europe.

TK216 Program

Oncternal has exclusive worldwide rights to a portfolio of patents and patent applications related to small molecules, including TK216, targeting EWS-FLI1 for use in therapeutics and companion diagnostics. TK216

targets the EWS/FLI1 fusion protein, inhibits tumor cell proliferation and induces apoptosis in Ewing sarcoma cells. This portfolio, the Georgetown Licensed Portfolio, is licensed from Georgetown University. In addition to the portfolio licensed from Georgetown University, Oncternal holds a portfolio of patents and patent applications, the Oncternal Portfolio, related to TK216, analogs thereof, and uses thereof.

As of March 31, 2019, the Georgetown Licensed Portfolio consisted of approximately six U.S. issued patents, as well as 14 patents and 13 pending patent applications in jurisdictions outside of the United States. As of March 31, 2019, Oncternal had two U.S. patents directed to TK216: U.S. Pat. No. 9,604,927, with a patent term not due to expire before October 2035, and U.S. Pat. No. 9,987,251, with a patent term not due to expire before October 2035. Oncternal also had claims covering methods of inhibiting growth of or killing neoplastic cells: U.S. Pat. No. 9,895,352, with a patent term not due to expire before October 2035. Oncternal had approximately one pending U.S. application and 15 patents or pending applications in jurisdictions outside the U.S., including Australia, Argentina, Canada, China, Eurasia, Europe, Hong Kong, Israel, Japan, Korea, Mexico, New Zealand, Pakistan, and Taiwan. Patents issuing from these applications would not be due to expire before October 2035. Oncternal also had claims covering compositions of TK216 in combination with venetoclax and methods of inducing apoptosis in cells in AML and DLBCL: U.S. Pat. No. 10,159,660, with a patent term not due to expire before July 2037. Oncternal had approximately one pending U.S. application and 13 pending applications filed in jurisdictions outside the U.S., including Argentina, Canada, China, Europe, Indonesia, Japan, Korea, Mexico, Malaysia, Philippines, Singapore, Taiwan, and Vietnam. Patents issuing from these applications would not be due to expire before July 2037.

As of March 31, 2019, the Georgetown Licensed Portfolio contained patents directed to other compounds that function as, e.g., EWS-FLI1 inhibitors. Oncternal had three U.S. patents directed to compounds and methods for treating Ewing sarcoma or pancreatic cancer: U.S. Pat. No. 8,232,301, with a patent term not due to expire before November 2028, U.S. Pat. No. 9,045,415, with a patent term not due to expire before August 2028, and U.S. Pat. No. 9,758,481, with a patent term not due to expire before December 2027. Oncternal had four issued patents in jurisdictions outside the U.S., including Australia, Canada, Europe, and Hong Kong. These patents are not due to expire before December 2027.

As of March 31, 2019, the Georgetown Licensed Portfolio contained additional patents and pending applications related to other compounds that target EWS-FLI1. Oncternal had two issued U.S. patents directed to compounds and methods for treating pancreatic cancer or Ewing sarcoma: U.S. Pat. No. 9,290,449, with a patent term not due to expire before April 2033, and U.S. Pat. No. 9,714,222, with a patent term not due to expire before April 2033. There were patents or pending applications outside the U.S. in Australia, Canada, China, Europe, Hong Kong, Israel, India, Japan, Korea, Mexico, and New Zealand. These patents have a patent term not due to expire before April 2033, and patents issuing from these applications would not be due to expire before April 2033.

As of March 31, 2019, the Georgetown Licensed Portfolio contained additional patents and pending applications related to methods of treating cancers. Oncternal had one issued U.S. patent directed to methods of treating lung cancer or glioblastoma multiforme: U.S. Pat. No. 9,511,050, with a patent term not due to expire before October 2034. There were patents or pending applications outside the U.S. in Australia, Canada, China, Japan, Korea, Mexico and New Zealand. These patents have a patent term not due to expire before October 2034, and patents issuing from these applications would not be due to expire before October 2034.

As of March 31, 2019, the Oncternal Portfolio further contained additional patents and pending applications related to indoline derivative compounds, which are analogs of TK216, that act as EWS-FLI1 inhibitors. Oncternal had one issued U.S. patent directed to compounds and methods of inhibiting proliferation of a cell expressing an ETS gene or comprising an ETS fusion gene: U.S. Pat. No. 9,822,122, with a patent term not due to expire before March 2037. There was one pending U.S. application and approximately eight applications pending outside the U.S. in Argentina, Pakistan, Taiwan, China, Europe, Japan, Korea, and Malaysia. Patents issuing from these applications would not be due to expire before March 2037.

Individual patents extend for varying periods of time, depending upon the date of filing of the patent application, the date of patent issuance, and the legal term of patents in the countries in which they are obtained. Generally, patents issued for applications filed in the United States are effective for 20 years from the earliest effective filing date. The patent term may be adjusted to compensate for delayed patent issuance, when such delays are caused by the patent office or successful appeals against patent office actions. There is no limit on this patent term adjustment. In addition, in certain instances, a patent term can be extended to recapture a portion of the term effectively lost as a result of the FDA regulatory review period. The restoration period cannot be longer than five years and the total patent term, including the restoration period, must not exceed 14 years following the date of FDA approval of the applicable drug product. The duration of patents outside of the United States varies in accordance with provisions of applicable local law, but typically is also 20 years from the earliest effective filing date. Our issued patents are due to expire on dates ranging from 2026-2037. If patents are issued on our pending patent applications, the resulting patents would be due to expire on dates ranging from 2026-2037. However, the actual protection afforded by a patent varies on a product-by-product basis, from country-to-country, and depends upon many factors, including the type of patent, the scope of its coverage, the availability of regulatory-related extensions, the availability of legal remedies in a particular country, and the validity and enforceability of the patent.

Government Regulation

Government authorities in the United States, at the federal, state and local level, and other countries extensively regulate, among other things, the research, development, testing, manufacture, quality control, approval, labeling, packaging, storage, record-keeping, promotion, advertising, distribution, marketing and export and import of products such as those Oncternal is developing. A new drug must be approved by the FDA through the NDA process and a new biologic must be approved by the FDA through the BLA process before it may be legally marketed in the United States.

United States Drug Development Process

In the United States, the FDA regulates drugs under the federal Food, Drug, and Cosmetic Act (“FDCA”), and in the case of biologics, also under the Public Health Service Act (“PHSA”), and their implementing regulations. The process of obtaining regulatory approvals and the subsequent compliance with appropriate federal, state, local and foreign statutes and regulations require the expenditure of substantial time and financial resources. Failure to comply with the applicable U.S. requirements at any time during the product development process, approval process or after approval may subject an applicant to administrative or judicial sanctions. These sanctions could include the FDA’s refusal to approve pending applications, withdrawal of an approval, a clinical hold, warning letters, product recalls, product seizures, total or partial suspension of production or distribution, injunctions, fines, refusals of government contracts, restitution, disgorgement or civil or criminal penalties. Any agency or judicial enforcement action could have a material adverse effect on Oncternal.

The process required by the FDA before a drug or biologic may be marketed in the United States generally involves the following:

- completion of preclinical laboratory tests, animal studies and formulation studies in accordance with GLP regulations and other applicable regulations;
- submission to the FDA of an Investigational New Drug Application, or IND, which must become effective before human clinical trials may begin;
- performance of adequate and well-controlled human clinical trials in accordance with Good Clinical Practice (“GCP”), requirements to establish the safety and efficacy of the proposed drug for its intended use;
- submission to the FDA of an NDA or BLA;

- satisfactory completion of an FDA inspection of the manufacturing facility or facilities at which the drug is produced to assess compliance with cGMP requirements to assure that the facilities, methods and controls are adequate to preserve the drug's identity, strength, quality and purity; and
- FDA review and approval of the NDA or BLA.

The clinical study sponsor must submit the results of the preclinical tests, together with manufacturing information, analytical data, any available clinical data or literature and a proposed clinical protocol, to the FDA as part of the IND. Some preclinical testing may continue even after the IND is submitted. The IND automatically becomes effective 30 days after receipt by the FDA, unless the FDA places the clinical study on a clinical hold within that 30-day time period. In such a case, the IND sponsor and the FDA must resolve any outstanding concerns before the clinical study can begin. The FDA may also impose clinical holds on a biological product candidate at any time before or during clinical trials due to safety concerns or non-compliance. If the FDA imposes a clinical hold, trials may not recommence without FDA authorization and then only under terms authorized by the FDA.

In addition to the submission of an IND to the FDA before initiation of a clinical trial in the United States, certain human clinical trials involving recombinant or synthetic nucleic acid molecules had historically been subject to review by the Recombinant DNA Advisory Committee ("RAC"), of the NIH Office of Biotechnology Activities, or OBA, pursuant to the NIH Guideline. On August 17, 2018, the NIH issued a notice in the Federal Register and issued a public statement proposing changes to the oversight framework for gene therapy trials, including changes to the applicable NIH Guidelines to modify the roles and responsibilities of the RAC with respect to human clinical trials of gene therapy products, and requesting public comment on its proposed modifications. During the public comment period, which closed on October 16, 2018, the NIH announced that it will no longer accept new human gene transfer protocols for review as a part of the protocol registration process or convene the RAC to review individual clinical protocols. These trials will remain subject to the FDA's oversight and other clinical trial regulations, and oversight at the local level as set forth in the applicable NIH Guidelines. Specifically, under the NIH Guidelines, supervision of human gene transfer trials includes evaluation and assessment by an IBC, a local institutional committee that reviews and oversees research utilizing recombinant or synthetic nucleic acid molecules at that institution. The IBC assesses the safety of the research and identifies any potential risk to public health or the environment, and such review may result in some delay before initiation of a clinical trial. While the NIH Guidelines are not mandatory unless the research in question is being conducted at or sponsored by institutions receiving NIH funding of recombinant or synthetic nucleic acid molecule research, many companies and other institutions not otherwise subject to the NIH Guidelines voluntarily follow them.

Clinical trials involve the administration of a product candidate to healthy volunteers or patients under the supervision of qualified investigators, generally physicians not employed by or under the study sponsor's control. Clinical trials are conducted under protocols detailing, among other things, the objectives of the clinical study, dosing procedures, patient selection and exclusion criteria, and the parameters to be used to monitor patient safety, including stopping rules that assure a clinical study will be stopped if certain adverse events should occur. Each protocol and any amendments to the protocol must be submitted to the FDA as part of the IND. Clinical trials must be conducted and monitored in accordance with the FDA's regulations including GCP requirements, including the requirement that all research patients provide informed consent. Further, each clinical study must be reviewed and approved by an independent institutional review board, or IRB, at or servicing each institution at which the clinical study will be conducted. Human clinical trials are typically conducted in three sequential phases that may overlap or be combined:

- **Phase 1**: The product candidate is initially administered to healthy human subjects and tested for safety, dosage tolerance, absorption, metabolism, distribution and excretion. In the case of some products for severe or life-threatening diseases, such as cancer, especially when the product may be too inherently toxic to ethically administer to healthy volunteers, the initial human testing is often conducted in patients.

- **Phase 2**: This phase involves clinical trials in a limited patient population to identify possible adverse effects and safety risks, to preliminarily evaluate the efficacy of the product for specific targeted diseases and to determine the appropriate dosage for further clinical trials.
- **Phase 3**: Clinical trials are undertaken to further evaluate dosage, clinical efficacy and safety in an expanded patient population at geographically dispersed clinical study sites. These clinical trials are intended to establish the safety and efficacy of the product and the overall risk-benefit ratio of the product candidate and provide, if appropriate, an adequate basis for product labeling and commercial use of the product.

Post-approval trials, sometimes referred to as Phase 4 studies, may be conducted after initial marketing approval. These trials are used to gain additional experience from the treatment of patients in the intended therapeutic indication. In certain instances, the FDA may mandate the performance of Phase 4 clinical trials as a condition of approval of an NDA or BLA.

The FDA or the sponsor may suspend a clinical trial at any time on various grounds, including a finding that the research subjects or patients are being exposed to an unacceptable health risk. Similarly, an IRB can suspend or terminate approval of a clinical trial at its institution if the clinical trial is not being conducted in accordance with the IRB's requirements or if the drug has been associated with unexpected serious harm to patients. In addition, some clinical trials are overseen by an independent group of qualified experts organized by the sponsor, known as a data safety monitoring board or committee. Depending on its charter, this group may determine whether a trial may move forward at designated check points based on access to certain data from the trial.

During the development of a new drug or biologic, sponsors are given opportunities to meet with the FDA at certain points. These points may be prior to submission of an IND, at the end of Phase 2, and before an NDA or BLA is submitted. Meetings at other times may be requested. These meetings can provide an opportunity for the sponsor to share information about the data gathered to date, for the FDA to provide advice, and for the sponsor and the FDA to reach agreement on the next phase of development. Sponsors typically use the meetings at the end of the Phase 2 trial to discuss Phase 2 clinical results and present plans for the pivotal Phase 3 clinical trial that they believe will support approval of the new drug or biologic.

Concurrent with clinical trials, companies usually complete additional animal studies and must also develop additional information about the chemistry and physical characteristics of the drug and finalize a process for manufacturing the product in commercial quantities in accordance with cGMP requirements. The manufacturing process must be capable of consistently producing quality batches of the product candidate and, among other things, the manufacturer must develop methods for testing the identity, strength, quality and purity of the final drug. In addition, appropriate packaging must be selected and tested, and stability studies must be conducted to demonstrate that the product candidate does not undergo unacceptable deterioration over its shelf life. While the IND is active and before approval, progress reports summarizing the results of the clinical trials and nonclinical studies performed since the last progress report must be submitted at least annually to the FDA, and written IND safety reports must be submitted to the FDA and investigators for serious and unexpected suspected adverse events, findings from other studies suggesting a significant risk to humans exposed to the same or similar drugs, findings from animal or *in vitro* testing suggesting a significant risk to humans, and any clinically important increased incidence of a serious suspected adverse reaction compared to that listed in the protocol or investigator brochure.

There are also requirements governing the reporting of ongoing clinical trials and completed trial results to public registries. Sponsors of certain clinical trials of FDA-regulated products are required to register and disclose specified clinical trial information, which is publicly available at www.clinicaltrials.gov. Information related to the product, patient population, phase of investigation, trial sites and investigators and other aspects of the clinical trial is then made public as part of the registration. Sponsors are also obligated to discuss the results of their clinical trials after completion. Disclosure of the results of these trials can be delayed until the new product or new indication being studied has been approved.

United States Review and Approval Process

The results of product development, preclinical and other non-clinical studies and clinical trials, along with descriptions of the manufacturing process, analytical tests conducted on the chemistry of the drug, proposed labeling and other relevant information are submitted to the FDA as part of an NDA or BLA requesting approval to market the product. The submission of an NDA or BLA is subject to the payment of user fees; a waiver of such fees may be obtained under certain limited circumstances.

The FDA reviews all NDAs and BLAs submitted to ensure that they are sufficiently complete for substantive review before it accepts them for filing. The FDA may request additional information rather than accept an NDA or BLA for filing. In this event, the NDA or BLA must be resubmitted with the additional information. The resubmitted application also is subject to review before the FDA accepts it for filing.

Once the submission is accepted for filing, the FDA begins an in-depth substantive review. The FDA may refer the NDA or BLA to an advisory committee for review, evaluation and recommendation as to whether the application should be approved and under what conditions. The FDA is not bound by the recommendation of an advisory committee, but it generally follows such recommendations. The approval process is lengthy and often difficult, and the FDA may refuse to approve an NDA or BLA if the applicable regulatory criteria are not satisfied or may require additional clinical or other data and information. Even if such data and information are submitted, the FDA may ultimately decide that the NDA or BLA does not satisfy the criteria for approval. The FDA reviews an NDA to determine, among other things, whether a product is safe and effective for its intended use and whether its manufacturing is cGMP-compliant to assure and preserve the product's identity, strength, quality and purity. The FDA reviews a BLA to determine, among other things whether the product is safe, pure and potent and the facility in which it is manufactured, processed, packed or held meets standards designed to assure the product's continued safety, purity and potency. Before approving an NDA or BLA, the FDA will inspect the facility or facilities where the product is manufactured.

After the FDA evaluates an NDA or BLA, it will issue an approval letter or a Complete Response Letter. An approval letter authorizes commercial marketing of the drug with prescribing information for specific indications. A Complete Response Letter indicates that the review cycle of the application is complete and the application will not be approved in its present form. A Complete Response Letter usually describes the specific deficiencies in the NDA or BLA identified by the FDA and may require additional clinical data, such as an additional pivotal Phase 3 trial or other significant and time-consuming requirements related to clinical trials, nonclinical studies or manufacturing. If a Complete Response Letter is issued, the sponsor must resubmit the NDA or BLA, addressing all of the deficiencies identified in the letter, or withdraw the application. Even if such data and information are submitted, the FDA may decide that the NDA or BLA does not satisfy the criteria for approval. If a product receives regulatory approval, the approval may be significantly limited to specific diseases and dosages or the indications for use may otherwise be limited, which could restrict the commercial value of the product. In addition, the FDA may require a sponsor to conduct Phase 4 testing, which involves clinical trials designed to further assess a drug's safety and effectiveness after NDA or BLA approval, and may require testing and surveillance programs to monitor the safety of approved products which have been commercialized. The FDA may also place other conditions on approval including the requirement for a risk evaluation and mitigation strategy ("REMS") to assure the safe use of the drug. If the FDA concludes a REMS is needed, the sponsor of the NDA must submit a proposed REMS. The FDA will not approve the NDA without an approved REMS, if required. A REMS could include medication guides, physician communication plans or elements to assure safe use, such as restricted distribution methods, patient registries and other risk minimization tools. Any of these limitations on approval or marketing could restrict the commercial promotion, distribution, prescription or dispensing of products. Marketing approval may be withdrawn for non-compliance with regulatory requirements or if problems occur following initial marketing.

The Food and Drug Administration Safety and Innovation Act ("FDASIA"), made permanent the Pediatric Research Equity Act ("PREA"), which requires a sponsor to conduct pediatric clinical trials for most drugs and

biologics, for a new active ingredient, new indication, new dosage form, new dosing regimen or new route of administration. Under PREA, original NDAs, BLAs and supplements thereto must contain a pediatric assessment unless the sponsor has received a deferral or waiver. The required assessment must evaluate the safety and effectiveness of the product for the claimed indications in all relevant pediatric subpopulations and support dosing and administration for each pediatric subpopulation for which the product is safe and effective. The sponsor or FDA may request a deferral of pediatric clinical trials for some or all of the pediatric subpopulations. A deferral may be granted for several reasons, including a finding that the drug or biologic is ready for approval for use in adults before pediatric clinical trials are complete or that additional safety or effectiveness data needs to be collected before the pediatric clinical trials begin. The FDA must send a non-compliance letter to any sponsor that fails to submit the required assessment, keep a deferral current or fails to submit a request for approval of a pediatric formulation.

Orphan Drug Designation

Under the Orphan Drug Act, the FDA may grant orphan designation to a drug or biologic intended to treat a rare disease or condition, which is a disease or condition that affects fewer than 200,000 individuals in the United States or, if it affects more than 200,000 individuals in the United States, there is no reasonable expectation that the cost of developing and making a drug or biologic product available in the United States for this type of disease or condition will be recovered from sales of the product. Orphan designation must be requested before submitting an NDA or BLA. After the FDA grants orphan designation, the identity of the therapeutic agent and its potential orphan use are disclosed publicly by the FDA. Orphan designation does not convey any advantage in or shorten the duration of the regulatory review and approval process.

If a product that has orphan designation subsequently receives the first FDA approval for the disease or condition for which it has such designation, the product is entitled to orphan product exclusivity, which means that the FDA may not approve any other applications to market the same drug or biological product for the same indication for seven years, except in limited circumstances, such as a showing of clinical superiority to the product with orphan exclusivity or inability to manufacture the product in sufficient quantities. The designation of such drug or biologic also entitles a party to financial incentives such as opportunities for grant funding towards clinical trial costs, tax advantages and user-fee waivers. However, competitors, may receive approval of different products for the indication for which the orphan product has exclusivity or obtain approval for the same product but for a different indication for which the orphan product has exclusivity. Orphan exclusivity also could block the approval of one of Oncternal's product candidates for seven years if a competitor obtains approval of the same drug or biologic as defined by the FDA or if Oncternal's product candidate is determined to be contained within the competitor's product for the same indication or disease. If an orphan designated product receives marketing approval for an indication broader than what is designated, it may not be entitled to orphan exclusivity. Orphan drug status in the European Union has similar but not identical benefits in that jurisdiction.

Although Oncternal has not sought or obtained orphan designation for any of its product candidates, the company may pursue such designation in the future if it determines that its proposed indications meet the qualifying criteria for such designation.

Expedited Development and Review Programs

The FDA has a Fast Track program that is intended to expedite or facilitate the process for reviewing new drug products that meet certain criteria. Specifically, new drugs are eligible for Fast Track designation if they are intended to treat a serious or life-threatening disease or condition and demonstrate the potential to address unmet medical needs for the disease or condition. Fast Track designation applies to the combination of the product and the specific indication for which it is being studied. Unique to a Fast Track product, the FDA may consider for review sections of the NDA or BLA on a rolling basis before the complete application is submitted, if the sponsor provides a schedule for the submission of the sections of the NDA or BLA, the FDA agrees to accept sections of the NDA or BLA and determines that the schedule is acceptable, and the sponsor pays any required user fees upon submission of the first section of the NDA or BLA.

Any product submitted to the FDA for approval, including a product with a Fast Track designation, may also be eligible for other types of FDA programs intended to expedite development and review, such as priority review and accelerated approval. A product is eligible for priority review if it has the potential to provide a significant improvement in the treatment, diagnosis or prevention of a serious disease or condition compared to marketed products. The FDA will attempt to direct additional resources to the evaluation of an application for a new drug designated for priority review in an effort to facilitate the review. The FDA endeavors to review applications with priority review designations within six months of the filing date as compared to ten months for review of original BLAs and new molecular entity NDAs under its standard review goals.

In addition, a product may be eligible for accelerated approval. Drug and biologic products intended to treat serious or life-threatening diseases or conditions may be eligible for accelerated approval upon a determination that the product has an effect on a surrogate endpoint that is reasonably likely to predict clinical benefit, or on a clinical endpoint that can be measured earlier than irreversible morbidity or mortality, that is reasonably likely to predict an effect on irreversible morbidity or mortality or other clinical benefit, taking into account the severity, rarity, or prevalence of the condition and the availability or lack of alternative treatments. As a condition of approval, the FDA may require that a sponsor of a drug receiving accelerated approval perform adequate and well-controlled post-marketing clinical trials. In addition, the FDA currently requires as a condition for accelerated approval pre-approval of promotional materials, which could adversely impact the timing of the commercial launch of the product. Fast Track designation, priority review and accelerated approval do not change the standards for approval but may expedite the development or approval process.

FDASIA established a category of drugs and biologics referred to as “breakthrough therapies” that may be eligible to receive Breakthrough Therapy Designation. A sponsor may seek FDA designation of a drug or biologic candidate as a “breakthrough therapy” if the product is intended, alone or in combination with one or more other products, to treat a serious or life-threatening disease or condition and preliminary clinical evidence indicates that the product may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development. The designation includes all of the Fast Track program features, as well as more intensive FDA interaction and guidance. The Breakthrough Therapy Designation is a distinct status from both accelerated approval and priority review, which can also be granted to the same drug if relevant criteria are met. If a product is designated as breakthrough therapy, the FDA will expedite the development and review of such drug. All requests for breakthrough therapy designation will be reviewed within 60 days of receipt, and the FDA will either grant or deny the request.

Post-approval requirements

Once an approval is granted, the FDA may withdraw the approval if compliance with regulatory standards is not maintained or if problems occur after the product reaches the market. Later discovery of previously unknown problems with a product may result in restrictions on the product or even complete withdrawal of the product from the market. After approval, some types of changes to the approved product, such as adding new indications, certain manufacturing changes and additional labeling claims, are subject to further FDA review and approval. Drug and biologics manufacturers and other entities involved in the manufacture and distribution of approved drugs and biologics are required to register their establishments with the FDA and certain state agencies, and are subject to periodic unannounced inspections by the FDA and certain state agencies for compliance with cGMP regulations and other laws and regulations.

Any drug products manufactured or distributed by us or Oncternal’s partners pursuant to FDA approvals will be subject to continuing regulation by the FDA, including, among other things, record-keeping requirements, reporting of adverse experiences with the drug, providing the FDA with updated safety and efficacy information, drug sampling and distribution requirements, complying with certain electronic records and signature requirements, and complying with FDA promotion and advertising requirements. The FDA strictly regulates labeling, advertising, promotion and other types of information on products that are placed on the market and

imposes requirements and restrictions on drug and biologics manufacturers, such as those related to direct-to-consumer advertising, the prohibition on promoting products for uses or in patient populations that are not described in the product's approved labeling (known as "off-label use"), industry-sponsored scientific and educational activities, and promotional activities involving the internet. Discovery of previously unknown problems or the failure to comply with the applicable regulatory requirements may result in restrictions on the marketing of a product or withdrawal of the product from the market as well as possible civil or criminal sanctions. Failure to comply with the applicable U.S. requirements at any time during the product development process, approval process or after approval, may subject an applicant or manufacturer to administrative or judicial civil or criminal sanctions and adverse publicity. FDA sanctions could include refusal to approve pending applications, withdrawal of an approval, clinical hold, warning or untitled letters, product recalls, product seizures, total or partial suspension of production or distribution, injunctions, fines, refusals of government contracts, mandated corrective advertising or communications with doctors, debarment, restitution, disgorgement of profits, or civil or criminal penalties.

Biosimilars and Exclusivity

The Affordable Care Act includes a subtitle called the Biologics Price Competition and Innovation Act of 2009 ("BPCIA"), which created an abbreviated approval pathway for biological products that are biosimilar to or interchangeable with an FDA-licensed reference biological product. To date, few biosimilars have been licensed under the BPCIA, although numerous biosimilars have been approved in Europe. The FDA has issued several guidance documents outlining an approach to review and approval of biosimilars.

Biosimilarity, which requires that there be no clinically meaningful differences between the biological product and the reference product in terms of safety, purity, and potency, can be shown through analytical studies, animal studies, and a clinical study or studies. Interchangeability requires that a product is biosimilar to the reference product and the product must demonstrate that it can be expected to produce the same clinical results as the reference product in any given patient and, for products that are administered multiple times to an individual, the biologic and the reference biologic may be alternated or switched after one has been previously administered without increasing safety risks or risks of diminished efficacy relative to exclusive use of the reference biologic. However, complexities associated with the larger, and often more complex, structures of biological products, as well as the processes by which such products are manufactured, pose significant hurdles to implementation of the abbreviated approval pathway that are still being addressed by the FDA.

Under the BPCIA, an application for a biosimilar product may not be submitted to the FDA until four years following the date that the reference product was first licensed by the FDA. In addition, the approval of a biosimilar product may not be made effective by the FDA until 12 years from the date on which the reference product was first licensed. During this 12-year period of exclusivity, another company may still market a competing version of the reference product if the FDA approves a full BLA for the competing product containing the sponsor's own preclinical data and data from adequate and well-controlled clinical trials to demonstrate the safety, purity and potency of their product. The BPCIA also created certain exclusivity periods for biosimilars approved as interchangeable products. At this juncture, it is unclear whether products deemed "interchangeable" by the FDA will, in fact, be readily substituted by pharmacies, which are governed by state pharmacy law.

The BPCIA is complex and continues to be interpreted and implemented by the FDA. In addition, recent government proposals have sought to reduce the 12-year reference product exclusivity period. Other aspects of the BPCIA, some of which may impact the BPCIA exclusivity provisions, have also been the subject of recent litigation. As a result, the ultimate impact, implementation and meaning of the BPCIA is subject to significant uncertainty.

Approval Process Outside of the United States

In addition to regulations in the United States, the company will be subject to a variety of regulations in other jurisdictions governing, among other things, clinical studies and any commercial sales and distribution of Oncternal's product candidates.

Whether or not Oncternal obtains FDA approval for a product candidate, the company must obtain the requisite approvals from regulatory authorities in foreign countries prior to the commencement of clinical studies or marketing of the product candidates in those countries. Certain countries outside of the United States have a similar process that requires the submission of a clinical study application much like the IND prior to the commencement of human clinical studies. In the European Union, for example, a clinical trial authorization ("CTA") must be submitted to each country's national health authority and an independent ethics committee, much like the FDA and the IRB, respectively. Once the CTA is approved in accordance with a country's requirements, clinical study development may proceed.

To obtain regulatory approval of an investigational biological product under European Union regulatory systems, Oncternal must submit a marketing authorization application. The application used to file the BLA in the United States is similar to that required in the European Union, with the exception of, among other things, country-specific document requirements. The European Union also provides opportunities for market exclusivity. For example, in the European Union, upon receiving marketing authorization, new chemical entities generally receive eight years of data exclusivity and an additional two years of market exclusivity. If granted, data exclusivity prevents regulatory authorities in the European Union from referencing the innovator's data to assess a generic application. During the additional two-year period of market exclusivity, a generic marketing authorization can be submitted, and the innovator's data may be referenced, but no generic product can be marketed until the expiration of the market exclusivity. However, there is no guarantee that a product will be considered by the European Union's regulatory authorities to be a new chemical entity, and products may not qualify for data exclusivity. Products receiving orphan designation in the European Union can receive ten years of market exclusivity, during which time no similar medicinal product for the same indication may be placed on the market. An orphan product can also obtain an additional two years of market exclusivity in the European Union for pediatric studies. No extension to any supplementary protection certificate can be granted on the basis of pediatric studies for orphan indications.

The criteria for designating an "orphan medicinal product" in the European Union are similar in principle to those in the United States. Under Article 3 of Regulation (EC) 141/2000, a medicinal product may be designated as orphan if (1) it is intended for the diagnosis, prevention or treatment of a life-threatening or chronically debilitating condition; (2) either (a) such condition affects no more than five in 10,000 persons in the European Union when the application is made, or (b) the product, without the benefits derived from orphan status, would not generate sufficient return in the European Union to justify investment; and (3) there exists no satisfactory method of diagnosis, prevention or treatment of such condition authorized for marketing in the European Union, or if such a method exists, the product will be of significant benefit to those affected by the condition, as defined in Regulation (EC) 847/2000. Orphan medicinal products are eligible for financial incentives such as reduction of fees or fee waivers and are, upon grant of a marketing authorization, entitled to ten years of market exclusivity for the approved therapeutic indication. The application for orphan drug designation must be submitted before the application for marketing authorization. The applicant will receive a fee reduction for the marketing authorization application if the orphan drug designation has been granted, but not if the designation is still pending at the time the marketing authorization is submitted. Orphan drug designation does not convey any advantage in, or shorten the duration of, the regulatory review and approval process.

The 10-year market exclusivity may be reduced to six years if, at the end of the fifth year, it is established that the product no longer meets the criteria for orphan designation, for example, if the product is sufficiently profitable not to justify maintenance of market exclusivity. In addition, marketing authorization may be granted to a similar product for the same indication at any time if:

- the second applicant can establish that its product, although similar, is safer, more effective or otherwise clinically superior;
- the applicant consents to a second orphan medicinal product application; or
- the applicant cannot supply enough orphan medicinal product.

For other countries outside of the European Union, such as countries in Eastern Europe, Latin America or Asia, the requirements governing the conduct of clinical studies, product licensing, pricing and reimbursement vary from country to country. In all cases, again, the clinical studies are conducted in accordance with GCP and the applicable regulatory requirements and the ethical principles that have their origin in the Declaration of Helsinki.

If Oncternal fails to comply with applicable foreign regulatory requirements, Oncternal may be subject to, among other things, fines, suspension or withdrawal of regulatory approvals, product recalls, seizure of products, operating restrictions and criminal prosecution.

Other Healthcare Laws and Compliance Requirements

Pharmaceutical companies are subject to additional healthcare regulation and enforcement by the U.S. federal and state governments and by authorities in the foreign jurisdictions in which they conduct their business. At the federal level, such laws include, without limitation: the U.S. federal Anti-Kickback Statute, which prohibits, among other things, persons and entities from knowingly and willfully soliciting, receiving, offering or paying remuneration, to induce, or in return for, either the referral of an individual, or the purchase or recommendation of an item or service for which payment may be made under any federal healthcare program; federal civil and criminal false claims laws and civil monetary penalty laws, including the civil False Claims Act, which prohibit, among other things, individuals or entities from knowingly presenting, or causing to be presented, claims for payment to the federal government, including federal healthcare programs, that are false or fraudulent; the federal Health Insurance Portability and Accountability Act of 1996 (“HIPAA”), which prohibits, among other things, executing a scheme to defraud any healthcare benefit program and making false statements relating to healthcare matters; and the federal Physician Payments Sunshine Act, which requires certain manufacturers of drugs, devices, biologics and medical supplies for which payment is available under Medicare, Medicaid or the Children’s Health Insurance Program, with specific exceptions, to annually report to the federal government, information related to payments or other transfers of value made to physicians and teaching hospitals, as well as ownership and investment interests held by physicians and their immediate family members.

Pharmaceutical companies are also subject to U.S. state and foreign law equivalents of each of the above federal laws, such as anti-kickback and false claims laws which may apply to sales or marketing arrangements and claims involving healthcare items or services reimbursed by non-governmental third-party payors, including private insurers, or that apply regardless of payor; laws which require pharmaceutical companies to comply with the pharmaceutical industry’s voluntary compliance guidelines and the relevant compliance guidance promulgated by the U.S. federal government, laws which require pharmaceutical companies to report information related to payments and other transfers of value to physicians and other healthcare providers or marketing expenditures and information related to drug pricing, and laws requiring the registration of pharmaceutical sales and medical representatives. Violation of these laws or other governmental regulations may result in penalties, including, without limitation, significant civil, criminal and administrative penalties, damages, fines, exclusion from government-funded healthcare programs, such as Medicare and Medicaid or similar programs in other countries or jurisdictions, integrity oversight and reporting obligations to resolve allegations of non-compliance, disgorgement, imprisonment, contractual damages, reputational harm, diminished profits and the curtailment or restructuring of operations.

Coverage and Reimbursement

Significant uncertainty exists as to the coverage and reimbursement status of any pharmaceutical or biological product for which we obtain regulatory approval. Sales of any product depend, in part, on the extent to which such product will be covered by third-party payors, such as federal, state, and foreign government healthcare programs, commercial insurance and managed healthcare organizations, and the level of reimbursement for such product by third-party payors. Decisions regarding the extent of coverage and amount of reimbursement to be provided are made on a plan-by-plan basis. Further, no uniform policy for coverage and reimbursement exists in the United States, and coverage and reimbursement can differ significantly from payor to payor. Third-party payors often rely upon Medicare coverage policy and payment limitations in setting their own reimbursement rates, but also have their own methods and approval process apart from Medicare determinations. As a result, the coverage determination process is often a time-consuming and costly process that may require companies to provide scientific and clinical support for the use of a product to each payor separately. For products administered under the supervision of a physician, obtaining coverage and adequate reimbursement may be particularly difficult because of the higher prices often associated with such drugs. Additionally, separate reimbursement for the product itself or the treatment or procedure in which the product is used may not be available, which may impact physician utilization. Lastly, companion diagnostic tests require coverage and reimbursement separate and apart from the coverage and reimbursement for their companion pharmaceutical or biological products. Similar challenges to obtaining coverage and reimbursement, applicable to pharmaceutical or biological products, will apply to companion diagnostics.

In addition, the U.S. government, state legislatures and foreign governments have continued implementing cost-containment programs, including price controls, restrictions on coverage and reimbursement and requirements for substitution of generic products. Third-party payors are increasingly challenging the prices charged for medical products and services, examining the medical necessity and reviewing the cost effectiveness of pharmaceutical or biological products, medical devices and medical services, in addition to questioning safety and efficacy. Adoption of price controls and cost-containment measures, and adoption of more restrictive policies in jurisdictions with existing controls and measures, could further limit sales of any product. Decreases in third-party reimbursement for any product or a decision by a third-party payor not to cover a product could reduce physician usage and patient demand for the product.

Healthcare Reform

The United States and some foreign jurisdictions are considering or have enacted a number of reform proposals to change the healthcare system. There is significant interest in promoting changes in healthcare systems with the stated goals of containing healthcare costs, improving quality or expanding access. In the United States, the pharmaceutical industry has been a particular focus of these efforts and has been significantly affected by federal and state legislative initiatives, including those designed to limit the pricing, coverage, and reimbursement of pharmaceutical and biopharmaceutical products, especially under government-funded health care programs, and increased governmental control of drug pricing.

In March 2010, the ACA was signed into law, which substantially changed the way healthcare is financed by both governmental and private insurers in the United States, and significantly affected the pharmaceutical industry. The ACA contains a number of provisions of particular import to the pharmaceutical and biotechnology industries, including, but not limited to, those governing enrollment in federal healthcare programs, a new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for drugs that are inhaled, infused, instilled, implanted or injected, and annual fees based on pharmaceutical companies' share of sales to federal health care programs. Since its enactment, there have been judicial, Congressional, and executive branch challenges to certain aspects of the ACA. For example, the Tax Act, was enacted on December 22, 2017, which includes a provision repealing, effective January 1, 2019, the tax-based shared responsibility payment imposed by the ACA on certain individuals who fail to maintain qualifying health insurance for all or part of a year that is commonly referred to as the "individual mandate." Additionally, on

December 14, 2018, a U.S. District Court Judge in the Northern District of Texas, ruled that the individual mandate is a critical and inseverable feature of the ACA, and therefore, because it was repealed as part of the Tax Act, the remaining provisions of the ACA are invalid as well. While the Trump Administration and CMS have both stated that the ruling will have no immediate effect, it is unclear how this decision, subsequent appeals, if any, and other efforts to repeal and replace the ACA will impact the law.

Other legislative changes have been proposed and adopted since the ACA was enacted, including aggregate reductions of Medicare payments to providers of 2% per fiscal year and reduced payments to several types of Medicare providers. Moreover, there has recently been heightened governmental scrutiny over the manner in which manufacturers set prices for their marketed products, which has resulted in several Congressional inquiries and proposed and enacted federal and state legislation designed to, among other things, bring more transparency to product pricing, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for drug products. At the federal level, the Trump administration's budget proposal for fiscal year 2019 contains further drug price control measures that could be enacted during the 2019 budget process or in other future legislation, including, for example, measures to permit Medicare Part D plans to negotiate the price of certain drugs under Medicare Part B, to allow some states to negotiate drug prices under Medicaid, and to eliminate cost sharing for generic drugs for low-income patients. Additionally, the Trump administration released a "Blueprint" to lower drug prices and reduce the out of pocket costs of prescription drugs that contains additional proposals to increase manufacturer competition, increase the negotiating power of certain federal healthcare programs, incentivize manufacturers to lower the list price of their products and reduce the out of pocket costs of drug products paid by consumers. The Department of Health and Human Services, or HHS, has already started the process of soliciting feedback on some of these measures and, at the same time, is immediately implementing others under its existing authority. For example, in September 2018, CMS announced that it will allow Medicare Advantage Plans the option to use step therapy for Part B drugs beginning January 1, 2019, and in October 2018, CMS proposed a new rule that would require direct-to-consumer television advertisements of prescription drugs and biological products, for which payment is available through or under Medicare or Medicaid, to include in the advertisement the Wholesale Acquisition Cost, or list price, of that drug or biological product. On January 31, 2019, the HHS Office of Inspector General proposed modifications to U.S. federal Anti-Kickback Statute safe harbors which, among other things, will affect rebates paid by manufacturers to Medicare Part D plans, the purpose of which is to further reduce the cost of drug products to consumers. Although some of these, and other, proposals will require authorization through additional legislation to become effective, Congress and the Trump administration have each indicated that it will continue to seek new legislative and/or administrative measures to control drug costs At the state level, legislatures have increasingly passed legislation and implemented regulations designed to control pharmaceutical product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access and marketing cost disclosure and transparency measures, and, in some cases, designed to encourage importation from other countries and bulk purchasing.

Data Privacy and Security Laws

Pharmaceutical companies may be subject to U.S. federal and state health information privacy, security and data breach notification laws, which may govern the collection, use, disclosure and protection of health-related and other personal information. State laws may be more stringent, broader in scope or offer greater individual rights with respect to protected health information, or PHI, than HIPAA, and state laws may differ from each other, which may complicate compliance efforts. Entities that are found to be in violation of HIPAA as the result of a breach of unsecured PHI, a complaint about privacy practices or an audit by HHS, may be subject to significant civil, criminal and administrative fines and penalties and/or additional reporting and oversight obligations if required to enter into a resolution agreement and corrective action plan with HHS to settle allegations of HIPAA non-compliance.

As of May 25, 2018, Regulation 2016/676, known as the General Data Protection Regulation ("GDPR"), replaced the Data Protection Directive with respect to the processing of personal data in the European Union. The

GDPR imposes many requirements for controllers and processors of personal data, including, for example, higher standards for obtaining consent from individuals to process their personal data, more robust disclosures to individuals and a strengthened individual data rights regime, shortened timelines for data breach notifications, limitations on retention and secondary use of information, increased requirements pertaining to health data and pseudonymized (i.e., key-coded) data and additional obligations when we contract third-party processors in connection with the processing of the personal data. The GDPR allows EU member states to make additional laws and regulations further limiting the processing of genetic, biometric or health data. Failure to comply with the requirements of GDPR and the applicable national data protection laws of the EU member states may result in fines of up to €20 million or up to 4% of the total worldwide annual turnover of the preceding financial year, whichever is higher, and other administrative penalties.

Employees

As of March 31, 2019, Oncternal had five full-time employees, three part-time employees, and a number of consultants, most of whom are engaged in research and development activities. None of Oncternal's employees are represented by labor unions or covered by collective bargaining agreements. Oncternal considers its relationship with its employees to be good.

Facilities

Oncternal's corporate headquarters are located in San Diego, California, where it currently subleases approximately 1,500 square feet of office space used primarily for corporate, research, development, clinical, regulatory, manufacturing and quality functions. Oncternal's sublease for this facility expires in May 2019. Oncternal believes that suitable additional alternative space will be available in the future on commercially reasonable terms.

Legal Proceedings

Oncternal is not currently subject to any material legal proceedings. From time to time, Oncternal may be involved in legal proceedings or subject to claims incident to the ordinary course of business. Regardless of the outcome, such proceedings or claims can have an adverse impact on Oncternal because of defense and settlement costs, diversion of resources and other factors, and there can be no assurances that favorable outcomes will be obtained.

GTX MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

The following discussion and analysis should be read in conjunction with GTx's financial statements and related notes included elsewhere in this proxy statement/prospectus/information statement. This discussion contains forward-looking statements based upon current expectations that involve risks and uncertainties. GTx's actual results and the timing of selected events could differ materially from those anticipated in these forward-looking statements as a result of several factors, including those set forth under Part I, Item 1A "Risk Factors" and elsewhere in this proxy statement/prospectus/information statement. See "Special Note Regarding Forward-Looking Statements" in this proxy statement/prospectus/information statement.

Overview

Business Overview and Highlights

GTx is a biopharmaceutical company dedicated to the discovery, development and commercialization of medicines to treat serious and/or significant unmet medical conditions. Under an exclusive worldwide license agreement with the University of Tennessee Research Foundation, or UTRF, GTx is developing UTRF's proprietary selective androgen receptor degrader, or SARD, technology, which it believes has the potential to provide compounds that can degrade or antagonize multiple forms of androgen receptor, or AR, thereby potentially inhibiting tumor growth in patients with progressive castration-resistant prostate cancer, or CRPC, including those patients who do not respond to or are resistant to current androgen targeted therapies. GTx is in the process of completing ongoing preclinical studies in order to select the most appropriate SARD compounds to move forward into the additional preclinical studies required to submit an investigational new drug application, or IND, and potentially advance one of its SARD compounds into a first-in-human clinical trial.

GTx had been developing selective androgen receptor modulators, or SARMs. GTx's SARM product candidate, enobosarm (GTx-024), was most recently evaluated in post-menopausal women with stress urinary incontinence, or SUI. During the third quarter of 2018, GTx announced that the ASTRID trial, evaluating the change in the mean number of daily SUI episodes following 12 weeks of enobosarm treatment failed to achieve statistical significance on the primary endpoint of the proportion of patients with a greater than 50% reduction in incontinence episodes per day compared to placebo. GTx has completed the ASTRID trial, including its review of the full data sets from the clinical trial, and has determined that there is not a sufficient path forward to warrant additional clinical development of enobosarm to treat SUI. GTx has therefore discontinued further development of enobosarm to treat SUI, including discontinuing the related durability and open-label safety extension studies it initiated before it received topline data from the ASTRID trial. GTx has also discontinued any further development of its SARM program generally.

Following the announcement of the ASTRID trial results, the GTx Board commenced a process of evaluating strategic alternatives to maximize stockholder value. To assist with this process, its board of directors engaged a financial advisory firm to help explore its available strategic alternatives, including possible mergers and business combinations, a sale of part or all of its assets, and collaboration and licensing arrangements. On March 6, 2019, GTx and Oncternal announced the signing of the Merger Agreement.

Although GTx has entered into the Merger Agreement and intends to consummate the merger, there is no assurance that it will be able to successfully consummate the merger on a timely basis, or at all. If, for any reason, the merger is not completed, it will reconsider its strategic alternatives and could pursue one or more of the following courses of action:

- ***Continue development of GTx's SARD program.*** As set forth above, GTx is in the process of completing ongoing preclinical studies in order to select the most appropriate SARD compounds to move forward into the additional preclinical studies required to submit an IND and potentially advance one of its SARD compounds into a first-in-human clinical trial. Accordingly, if, for any reason, the

merger is not consummated, it may determine to move forward with its planned IND-enabling studies of its SARD compounds. However, while GTx believes that its existing capital resources will be adequate to enable it to conduct and complete planned IND-enabling preclinical studies of its SARD compounds, GTx will require significant additional financial resources in order to initiate and complete initial human clinical trials of a SARD compound and to otherwise further the development of its SARD program. As a result, GTx may also resume its efforts to seek additional funds through potential collaborative, partnering or other strategic arrangements to provide it with the necessary resources for the development of its SARD program.

- ***Pursue potential collaborative, partnering or other strategic arrangements for GTx's SARM assets, including a sale or other divestiture of its SARM assets.*** GTx has discontinued further development of its SARM program, including enobosarm, and does not currently have any plans to resume development of its SARM program. GTx continues its efforts to seek potential collaborative, partnering or other strategic arrangements for its SARM assets, including a sale or other divestiture of its SARM assets.
- ***Pursue another strategic transaction like the merger.*** The GTx Board may elect to pursue an alternative strategy, one of which may be a strategic transaction similar to the merger.
- ***Dissolve and liquidate GTx's assets.*** If, for any reason, the merger is not consummated and GTx is unable to identify and complete an alternative strategic transaction like the merger or potential collaborative, partnering or other strategic arrangements for its SARM assets, or to continue to operate its business due to its inability to raise additional funding for the development of its SARM program or otherwise, GTx may be required to dissolve and liquidate its assets. In such case, GTx would be required to pay all of its debts and contractual obligations, and to set aside certain reserves for potential future claims, and there can be no assurances as to the amount or timing of available cash left to distribute to its stockholders after paying its debts and other obligations and setting aside funds for reserves.

Financial Highlights

GTx's net loss for the year ended December 31, 2018 was $38.4 million. GTx expects to incur significant operating losses for the foreseeable future depending on the extent of its preclinical and any clinical development activities and, if any such development activities are successful, potentially seeking regulatory approval of any potential future product candidates. GTx has funded its operations primarily through the sale of equity securities, collaboration and license agreements, and prior to September 2012, product revenue from sales of FARESTON, the rights to which GTx sold to a third-party in the third quarter of 2012. GTx does not expect to receive regulatory approval for the commercial sale of any product candidates for the foreseeable future, if at all.

At December 31, 2018, GTx had cash, cash equivalents and short-term investments of $28.5 million compared to $43.9 million at December 31, 2017. In May 2018, GTx sold 1.5 million shares of common stock under its At-the-Market Equity Offering SM Sales Agreement (the "ATM Sales Agreement"), with Stifel, Nicolaus & Company, Incorporated, or Stifel, and raised net proceeds of $24.5 million.

To conserve its cash resources, GTx has substantially reduced its workforce since November 2018 and has ceased its SARM development activities and all other operations except for day-to-day business operations, completing ongoing SARD preclinical studies and those activities necessary to complete the merger. In the first quarter of 2019, due to the entry into the Merger Agreement with Oncternal, its board of directors committed to reducing its workforce down to a total of eleven full-time employees, who will remain with GTx until the closing of the transaction to assist with its day-to-day business operations, including continuing its ongoing SARD preclinical studies, and those activities necessary to complete the merger. All employees affected by the workforce reduction will be eligible to receive, among other things, specified severance payments based on the applicable employee's level and years of service with GTx and the continuation of group health insurance

coverage. In addition, the affected employees will also be eligible for full vesting acceleration of their outstanding stock options as well as an extension of the post-termination exercise period for their outstanding stock options. As a result of the workforce reduction and prior termination of three employees earlier in the first quarter of 2019, GTx estimates that it will incur total severance-related charges for these employees of approximately $1.0 million in the first quarter of 2019 and up to an additional $500,000 contingent upon the closing of the merger. GTx does not expect to record a non-cash charge related to the modification of outstanding stock options in connection with the workforce reduction.

If the merger is not completed, based on its current business plan and spending assumptions as a standalone company, GTx estimates that its current cash, cash equivalents and short-term investments, together with interest thereon, will be sufficient to meet its projected operating requirements for at least the next 12 months. GTx has based its cash sufficiency estimates on its current business plan and its assumptions that may prove to be wrong. GTx could utilize its available capital resources sooner than it currently expects, and it could need additional funding sooner than currently anticipated.

While GTx believes that its existing capital resources will be adequate to enable it to conduct and complete planned IND-enabling preclinical studies of SARD compounds, it will require significant additional financial resources in order to initiate and complete initial human clinical trials of a SARD compound and to otherwise further the development of its SARD program. If GTx is unable to raise sufficient additional funds for the development of its SARD program, whether through potential collaborative, partnering or other strategic arrangements or otherwise, or if it otherwise determines to discontinue the development of its SARD program, GTx will likely determine to cease operations.

While GTx has been able to fund its operations to date, GTx has no ongoing collaborations for the development and commercialization of any product candidates and no source of revenue, nor does it expect to generate product revenue for the foreseeable future. GTx does not have any commitments for future external funding. In addition, although GTx has entered into an At-the-Market Equity Offering SM Sales Agreement with Stifel, Nicolaus & Company, Incorporated (the “ATM Sales Agreement”), under which approximately $25.0 million of shares of its common stock remained available for sale at December 31, 2018, it is unlikely it could raise sufficient funds under the ATM Sales Agreement to permit it to initiate and complete initial human clinical trials of a SARD compound, and given its currently-depressed stock price, the ATM Sales Agreement is not otherwise expected to be a practical source of liquidity for it at this time. Further, given its currently-depressed stock price, GTx is significantly limited in its ability to sell shares of common stock under the ATM Sales Agreement since the issuance and sale of its common stock under the ATM Sales Agreement, if it occurs, would be effected under a registration statement on Form S-3 that it filed with the Securities and Exchange Commission, and in accordance with the rules governing those registration statements, it generally can only sell shares of its common stock under that registration statement in an amount not to exceed one-third of its public float, which limitation for all practical purposes precludes its ability to obtain any meaningful funding through the ATM Sales Agreement at this time.

Until GTx can generate a sufficient amount of product revenue, which it may never do, it will need to finance future cash needs through potential collaborative, partnering or other strategic arrangements, as well as through public or private equity offerings or debt financings or a combination of the foregoing. If GTx is unable to raise additional funds, it will need to continue to reduce its expenditures in order to preserve its cash. Further cost-cutting measures that GTx may take may not be sufficient to enable it to meet its cash requirements, and they may negatively affect its business and its ability to derive any value from its SARD program. In any event, in order to further the development of its SARD program, GTx will need to raise substantial additional capital. GTx’s failure to do so would likely result in its determining to cease operations.

Research and Development

Since its inception in 1997, GTx has been focused on drug discovery and development programs. Research and development expenses include, but are not limited to, its expenses for personnel and supplies associated with its

research activities, screening and identification of product candidates, formulation and synthesis activities, manufacturing, preclinical studies, toxicology studies, clinical trials, regulatory and medical affairs activities, quality assurance activities and license fees. GTx expects that its research and development expenses for fiscal year 2019 to be significantly less than fiscal year 2018 primarily due to the completion of the ASTRID trial and termination of the related extension studies and due to the reductions in headcount during the fourth quarter of 2018 and the first quarter of 2019.

There is a substantial risk that any development program may not produce revenue. Moreover, because of uncertainties inherent in drug development, including those factors described in the "Risk Factors" section of this proxy statement/prospectus/information statement, GTx and/or potential future collaborators may not be able to successfully develop and commercialize any of its product candidates.

The successful development and commercialization of GTx's product candidates is highly uncertain. GTx cannot reasonably estimate or know the nature, timing and estimated costs of the efforts necessary to complete the development and commercialization of, or the period in which material net cash inflows are expected to commence from, any of its product candidates due to the numerous risks and uncertainties associated with developing and commercializing drugs, including the uncertainty of:

- the scope, rate of progress and cost of GTx's preclinical and potential future clinical development programs;
- the terms and timing of any potential collaborative, partnering and other strategic arrangements that GTx may establish;
- the amount and timing of any licensing fees, milestone payments and royalty payments from potential collaborators, if any;
- potential future clinical trial results;
- the cost and timing of regulatory filings and/or approvals to commercialize any potential future product candidates and any related restrictions, limitations, and/or warnings in the label of an approved product candidate;
- the effect of competing technological and market developments; and
- the cost of filing, prosecuting, defending and enforcing any patent claims and other intellectual property rights, and the cost of defending any other litigation claims.

Any failure to complete the development of any potential future product candidates in a timely manner could have a material adverse effect on GTx's operations, financial position and liquidity. A discussion of the risks and uncertainties associated with completing GTx's development efforts on schedule, or at all, and some consequences of failing to do so, are set forth under the "Risk Factors" section of this proxy statement/prospectus/information statement.

General and Administrative Expenses

GTx's general and administrative expenses consist primarily of salaries and other related costs for personnel serving executive, finance, legal, human resources, information technology, and investor relations functions. General and administrative expenses also include facility costs, insurance costs, and professional fees for legal, accounting, and public relations services. GTx expects its general and administrative expenses for fiscal year 2019 to decrease in comparison to fiscal year 2018 due to the reductions in headcount during the fourth quarter of 2018 and the first quarter of 2019.

Critical Accounting Policies and Significant Judgments and Estimates

GTx's management's discussion and analysis of its financial condition and results of operations is based on its financial statements, which have been prepared in accordance with accounting principles generally accepted in

the United States of America. The preparation of these financial statements requires GTx to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the financial statements as well as the reported revenues and expenses during the reporting periods. On an ongoing basis, GTx evaluates its estimates and judgments related to revenue recognition, income taxes, intangible assets, long-term service contracts, share-based compensation, and other contingencies. GTx bases its estimates on historical experience and on various other factors that it believes are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying value of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions.

While GTx's significant accounting policies are more fully described in Note 2 to its financial statements included in this proxy statement/prospectus/information statement, GTx believes that the following accounting policies are most critical to aid you in fully understanding and evaluating its reported financial results.

Research and Development Expenses

Research and development expenses include, but are not limited to, its expenses for personnel and supplies associated with its research activities, screening and identification of product candidates, formulation and synthesis activities, manufacturing, preclinical studies, toxicology studies, clinical trials, regulatory and medical affairs activities, quality assurance activities and license fees. GTx expenses these costs in the period in which they are incurred. GTx estimates its liabilities for research and development expenses in order to match the recognition of expenses to the period in which the actual services are received. As such, accrued liabilities related to third-party research and development activities are recognized based upon GTx's estimate of services received and degree of completion of the services in accordance with the specific third-party contract.

Share-Based Compensation

GTx has stock option and equity incentive plans that provide for the purchase or acquisition of its common stock by certain of its employees and non-employees. GTx measures compensation expense for its share-based payments based on the fair value of the awards on the grant date and recognize the expense over the period during which an employee or non-employee director is required to provide service in exchange for the award.

The determination of the fair value of stock options on the date of grant include the expected life of the award, the expected stock price volatility over the expected life of the awards, and risk-free interest rate. GTx estimates the expected life of options by calculating the average of the vesting term and contractual term of the options. GTx estimates the expected stock price volatility based on the historical volatility of its common stock. The risk-free interest rate is determined using U.S. Treasury rates where the term is consistent with the expected life of the stock options. Expected dividend yield is not considered as GTx has not made any dividend payments and has no plans of doing so in the foreseeable future. The fair value of each stock option is amortized into compensation expense on a straight-line basis between the grant date for the award and each vesting date. During the first quarter of 2017, GTx adopted the Financial Accounting Standards Board Accounting Standards Update 2016-09, *Improvements to Employee Share Based Payment Accounting*. This guidance addresses the income tax effects of stock-based payments and eliminates the windfall pool concept, as all of the tax effects related to stock-based payments are now being recorded at settlement (or expiration) through the income statement. The new guidance also permits entities to make an accounting policy election for the impact of forfeitures on the recognition of expense for stock-based payment awards, allowing for forfeitures to be estimated or recognized when they occur. GTx elected to prospectively adopt the policy that forfeitures be recorded when they occur. The adoption of this guidance did not have a material impact on its financial position or results of operations.

The following table summarizes share-based compensation expense included within the statements of operations for the years ended December 31, 2018, 2017 and 2016:

	Years ended December 31,		
	2018	2017	2016
	(in thousands)		
Research and development expenses	$ 807	$1,171	$1,260
General and administrative expenses	1,556	2,146	1,829
Total share-based compensation	$2,363	$3,317	$3,089

Share-based compensation expense recorded in the statement of operations as general and administrative expense for the years ended December 31, 2018, 2017 and 2016 included share-based compensation expense related to deferred compensation arrangements for GTx's non-employee directors of $166,000, $166,000 and $132,000, respectively. At December 31, 2018, the total compensation cost related to non-vested stock options not yet recognized was approximately $7.7 million with a weighted-average expense recognition period of 2.95 years.

Income Taxes

GTx accounts for deferred taxes by recognition of deferred tax assets and liabilities for the expected future tax consequences of events that have been included in the financial statements or tax returns. Under this method, deferred tax assets and liabilities are determined based on the difference between the financial statement and tax basis of assets and liabilities using enacted tax rates in effect for the year in which the differences are expected to reverse. A valuation allowance is provided when it is more likely than not that some portion or all of the deferred tax assets will not be realized. Accordingly, at December 31, 2018 and 2017, net of the valuation allowance, the net deferred tax assets were reduced to zero.

Results of Operations

Research and Development Expenses

The following table identifies the research and development expenses for GTx's SARD program and its discontinued SARM program, as well as research and development expenses pertaining to its other research and development efforts, for each of the periods presented. Research and development spending for past periods is not indicative of spending in future periods.

		Years Ended December 31,		
Proposed Candidate / Proposed Indication	Program	2018	2017	2016
Enobosarm				
Treatment of postmenopausal women with SUI (1 mg and 3 mg)	**SARM**	$25,576	$11,279	$ 1,286
Enobosarm				
Treatment of women with ER positive and AR positive advanced breast cancer (9 mg and 18 mg)	**SARM**	1,957	5,541	7,316
SARDs				
Treatment of castration resistant prostate cancer	**SARD**	1,052	1,772	2,157
Enobosarm				
Treatment of women with advanced AR positive TNBC (18 mg)	**SARM**	801	2,348	4,853
Other research and development		283	527	1,616
Total research and development expenses		$29,669	$21,467	$17,228

Research and development expenses increased 38% to $29.7 million for the year ended December 31, 2018 from $21.5 million for the year ended December 31, 2017. Research and development expenses increased 25% to $21.5 million for the year ended December 31, 2017 from $17.2 million for the year ended December 31, 2016.

Research and development expenses for enobosarm for the treatment of postmenopausal women with SUI substantially increased from the years ended December 31, 2017 and 2016 due to the initiation of the ASTRID trial, which opened for enrollment in the third quarter of 2017 and completed enrollment in the second quarter of 2018, and due to the related durability and open-label safety extension studies, which were initiated in the second quarter of 2018. During the third quarter of 2018, GTx announced that the ASTRID trial failed to achieve statistical significance on the primary endpoint of the proportion of patients with a greater than 50% reduction in incontinence episodes per day compared to placebo. The years ended December 31, 2016 and 2017 also included expenses related to the Phase 2 open-label, non-placebo controlled, proof-of-concept clinical trial of enobosarm to treat postmenopausal women with SUI that initiated enrollment in the first quarter of 2016.

Research and development expenses for enobosarm for the treatment of women with ER positive and AR positive advanced breast cancer decreased from the years ended December 31, 2017 and 2016 due primarily to the timing and nature of activities related to conducting the Phase 2 clinical trial evaluating enobosarm 9 mg and enobosarm 18 mg in this indication. The clinical trial commenced enrollment during the third quarter of 2015 and completed enrollment in the first quarter of 2017.

Research and development expenses for the SARD program for the year ended December 31, 2018 decreased from the prior years due to fewer drug formulation and preclinical research expenses being incurred during 2018 than in the comparable periods. If the merger is not completed, GTx expects increased research and development expenses for the SARD program in 2019 as it plans to complete ongoing preclinical studies, and to select the most appropriate SARD compounds to move forward with IND-enabling preclinical studies.

Research and development expenses for enobosarm for the treatment of women with AR positive TNBC decreased from the years ended December 31, 2017 and 2016 due to the timing and nature of activities related to conducting the first stage of the Phase 2 clinical trial, which commenced enrollment during the fourth quarter of 2015. During the third quarter of 2017, GTx determined that there were insufficient patients achieving clinical benefit from enobosarm treatment to continue this clinical trial.

General and Administrative Expenses

General and administrative expenses for the year ended December 31, 2018 of $9.4 million remained relatively consistent with the year ended December 31, 2017 of $9.2 million. General and administrative expenses increased 6% to $9.2 million for the year ended December 31, 2017 from $8.7 million for the year ended December 31, 2016. The increase during the year ended December 31, 2017 from the prior year was due primarily to an increase in share-based compensation expense.

Other Income (Expense), Net

Other income, net for the years ended December 31, 2018, 2017, and 2016 was $641,000, $216,000 and $46,000, respectively, and consisted of interest earned on GTx's cash, cash equivalents and short-term investments, foreign currency transaction gains and losses, and other non-operating income or expense. The increase in other income, net for each year over year was primarily due to interest earned on the net proceeds received from issuances of common stock by the Company.

Liquidity and Capital Resources

GTx has financed its operations to date primarily through public offerings and private placements of its securities, as well as payments from its former collaborators. GTx has incurred significant losses since its inception in 1997 as GTx has devoted substantially all of its resources to research and development, including its clinical trials. As of December 31, 2018, GTx had an accumulated deficit of $600.1 million, which resulted primarily from:

- its research and development activities associated with:
- the preclinical development of its SARD program;

- the preclinical and clinical development of its SARM compounds, including enobosarm;
- the preclinical and clinical development of its discontinued GTx-758 product candidate for the treatment of advanced prostate cancer;
- the development of its discontinued toremifene 80 mg product candidate to reduce fractures and treat other estrogen deficiency side effects of androgen deprivation therapy in men with prostate cancer, including two Phase 2 clinical trials, a Phase 3 clinical trial, and the preparation and submission of a NDA to the FDA;
- the development of its discontinued toremifene 20 mg product candidate for the prevention of prostate cancer in high risk men with high grade prostatic intraepithelial neoplasia, including a Phase 2b clinical trial and a Phase 3 clinical trial;
- the preclinical development of other product candidates; and
- general and administrative expenses.

GTx expects to incur significant operating losses for the foreseeable future depending on the extent of its preclinical and any clinical development activities and, if any such development activities are successful, potentially seeking regulatory approval of any potential future product candidates. These losses, among other things, have had and will continue to have an adverse effect on its stockholders' equity and working capital. GTx does not expect to receive regulatory approval for the commercial sale of any product candidates for the foreseeable future, if at all.

At December 31, 2018, GTx had cash, cash equivalents and short-term investments of $28.5 million, compared to $43.9 million at December 31, 2017 and $21.9 million at December 31, 2016.

In February 2018, GTx entered into the ATM Sales Agreement, pursuant to which it may offer and sell, from time to time, through Stifel, shares of its common stock having an aggregate offering price of up to $50 million. GTx is not obligated to sell any shares under the ATM Sales Agreement. Subject to the terms and conditions of the sales agreement, Stifel will use commercially reasonable efforts, consistent with its normal trading and sales practices, applicable state and federal law, rules and regulations and the rules of the Nasdaq Capital Market, to sell shares from time to time based upon GTx's instructions, including any price, time or size limits specified by it. Under the ATM Sales Agreement, Stifel may sell shares by any method deemed to be an "at-the-market" offering as defined in Rule 415 under the Securities Act of 1933, as amended, or any other method permitted by law, including in privately negotiated transactions. GTx will pay Stifel a commission of up to 3.0% of the aggregate gross proceeds from each sale of shares. In May 2018, GTx sold 1.5 million shares of common stock under the ATM Sales Agreement for net proceeds of $24.5 million. As of December 31, 2018, GTx had approximately $25.0 million of common stock remaining available to be sold under the ATM Sales Agreement. However, it is unlikely it could raise sufficient funds under the ATM Sales Agreement to permit it to initiate and complete initial human clinical trials of a SARD compound, and given its currently-depressed stock price, the ATM Sales Agreement is not otherwise expected to be a practical source of liquidity for GTx at this time. Further, given its currently-depressed stock price, GTx is significantly limited in its ability to sell shares of common stock under the ATM Sales Agreement since the issuance and sale of its common stock under the ATM Sales Agreement, if it occurs, would be effected under a registration statement on Form S-3 that it filed with the Securities and Exchange Commission, and in accordance with the rules governing those registration statements, GTx generally can only sell shares of its common stock under that registration statement in an amount not to exceed one-third of its public float, which limitation for all practical purposes precludes its ability to obtain any meaningful funding through the ATM Sales Agreement at this time.

On September 29, 2017, GTx completed a private placement of units consisting of an aggregate of 5.5 million shares of common stock and warrants to purchase an aggregate of 3.3 million shares of its common stock for net proceeds to it of approximately $45.6 million. The purchasers in the registered direct offering consisted solely of accredited investors that included certain institutional and existing stockholders, including a member of its board of directors.

On October 14, 2016, GTx completed a registered direct offering of its common stock consisting of 1.7 million shares of its common stock for net proceeds of approximately $13.7 million. The purchasers in the registered direct offering consisted of certain existing GTx stockholders and certain members of the GTx management team and board of directors.

The following table shows a summary of GTx's cash flows for the periods indicated:

	Years Ending December 31,		
	2018	2017	2016
		(in thousands)	
Net cash used in operating activities	$(39,346)	$(23,460)	$(20,778)
Net cash provided by (used in) investing activities	27,883	(15,126)	2,151
Net cash provided by financing activities	23,905	45,492	13,481
Net increase (decrease) in cash and cash equivalents	$ 12,442	$ 6,906	$ (5,146)

Net cash used in operating activities in all periods resulted primarily from funding its operations.

Net cash provided by investing activities was $27.9 million for the year ended December 31, 2018 and resulted primarily from maturities of short-term investments of $72.0 million offset by the purchase of short-term investments of $44.2 million. Net cash used in investing activities for the year ended December 31, 2017 primarily resulted from the purchase of short-term investments of $39.3 million offset by the maturities of short-term investments of $24.2 million. Net cash provided by investing activities for the year ended December 31, 2016 primarily resulted from the maturities of short-term investments of $37.6 million offset by the purchase of short-term investments of $35.4 million.

Net cash provided by financing activities for the year ended December 31, 2018 of $23.9 million resulted from the sale of common stock under the ATM Sales Agreement with Stifel and proceeds from the exercise of stock options of $103,000, offset slightly by $672,000 of tax payments related to shares withheld for vested restricted stock units. Net cash provided by financing activities for the year ended December 31, 2017 reflected net proceeds of $45.6 million from the issuance of common stock and warrants related to the September 2017 private placement, partially offset by $156,000 of employee withholding tax payments related to vested RSUs. Net cash provided by financing activities for the year ended December 31, 2016 reflected net proceeds of $13.7 million from the issuance of common stock related to the October 2016 registered direct offering, partially offset by $208,000 of employee withholding tax payments related to vested RSUs.

To conserve its cash resources, GTx has substantially reduced its workforce since November 2018 and has ceased its SARM development activities and all other operations except for day-to-day business operations, completing ongoing SARD preclinical studies and those activities necessary to complete the merger. If the merger is not completed, based on its current business plan and spending assumptions as a standalone company, GTx estimates that its current cash, cash equivalents and short-term investments, together with interest thereon, will be sufficient to meet its projected operating requirements for at least the next 12 months. GTx has based its cash sufficiency estimates on its current business plan and its assumptions that may prove to be wrong. GTx could utilize its available capital resources sooner than it currently expects, and it could need additional funding sooner than currently anticipated.

While GTx believes that its existing capital resources will be adequate to enable it to conduct and complete planned IND-enabling preclinical studies of SARD compounds, GTx will require significant additional financial resources in order to initiate and complete initial human clinical trials of a SARD compound and to otherwise further the development of its SARD program. If GTx is unable to raise sufficient additional funds for the development of its SARD program, whether through potential collaborative, partnering or other strategic arrangements or otherwise, or if GTx otherwise determines to discontinue the development of its SARD program, it will likely determine to cease operations.

GTx's estimate of the period of time or events through which its financial resources will be adequate to support its projected operating requirements is a forward-looking statement and involves risks and uncertainties, and actual results could vary as a result of a number of factors, including the factors discussed under the "Risk Factors" section of this proxy statement/prospectus/information statement. Because of the numerous risks and uncertainties associated with the development and potential commercialization of its product candidates and other research and development activities, including risks and uncertainties that could impact the rate of progress of its development activities, GTx is unable to estimate with certainty the amounts of increased capital outlays and operating expenditures associated with the future development of potential future product candidates, if any. GTx's future funding requirements will depend on many factors, including:

- its ability to successfully complete the merger;
- the scope, rate of progress and cost of its preclinical and potential future clinical development programs;
- the terms and timing of any potential collaborative, partnering and other strategic arrangements that it may establish;
- the amount and timing of any licensing fees, milestone payments and royalty payments from potential collaborators, if any;
- potential future clinical trial results;
- the cost and timing of regulatory filings and/or approvals to commercialize any potential future product candidates and any related restrictions, limitations, and/or warnings in the label of an approved product candidate;
- the effect of competing technological and market developments; and
- the cost of filing, prosecuting, defending and enforcing any patent claims and other intellectual property rights, and the cost of defending any other litigation claims.

While GTx has been able to fund its operations to date, GTx has no ongoing collaborations for the development and commercialization of any product candidates and no source of revenue, nor does it expect to generate product revenue for the foreseeable future. GTx does not have any commitments for future external funding.

Until GTx can generate a sufficient amount of product revenue, which it may never do, it will need to finance future cash needs through potential collaborative, partnering or other strategic arrangements, as well as through public or private equity offerings or debt financings or a combination of the foregoing. If GTx is unable to raise additional funds, it will need to continue to reduce its expenditures in order to preserve its cash. Further cost-cutting measures that it may take may not be sufficient to enable it to meet its cash requirements, and they may negatively affect its business and GTx's ability to derive any value from its SARD program. In any event, in order to further the development of its SARD program, GTx will need to raise substantial additional capital. GTx's failure to do so would likely result in its determining to cease operations.

To the extent that GTx raises additional funds through potential collaborations, partnering or other strategic arrangements, it may be necessary to relinquish rights to some of its technologies or product candidates and intellectual property rights thereof, or grant licenses on terms that are not favorable to it, any of which could result in GTx's stockholders having little or no continuing interest in its SARD program and/or SARM assets as stockholders or otherwise. To the extent GTx raises additional funds by issuing equity securities, its stockholders may experience significant dilution, particularly given its currently-depressed stock price, and debt financing, if available, may involve restrictive covenants. For example, GTx completed substantially dilutive private placements of its common stock and warrants in March 2014, November 2014 and September 2017, in addition to a registered direct offering of its common stock that GTx completed in October 2016 and the sale of its common stock pursuant to the ATM Sales Agreement. GTx's stockholders will experience additional, perhaps substantial, dilution should it again raise additional funds by issuing equity securities. Any additional debt or

equity financing that it raises may contain terms that are not favorable to it or its stockholders. GTx's ability to raise additional funds and the terms upon which GTx is able to raise such funds have been severely harmed by the failure of the ASTRID trial to meet its primary endpoint and the resulting significant uncertainty regarding its prospects to continue as a going concern. If GTx is unable to complete the merger, its ability to raise additional funds and the terms upon which GTx is able to raise such funds may also be adversely affected by the uncertainties regarding its financial condition, uncertainties with respect to the prospects for its early-stage SARD program, the sufficiency of its capital resources, potential future management turnover, and volatility and instability in the global financial markets. As a result of these and other factors, there is no guarantee that sufficient additional funding will be available to it on acceptable terms, or at all.

Contractual Obligations

At December 31, 2018, GTx had contractual obligations as follows:

	Payment Due by Period (in thousands)				
Contractual Obligations (1)	**Total**	**Less than 1 year**	**1-3 years**	**4-5 years**	**More than 5 years**
Operating lease obligations(2)	$162	$ 162	$ —	$ —	$ —

(1) This table does not include any royalty obligations under GTx's SARM and SARD license agreements with UTRF as the timing and likelihood of such payments are not known. In addition to the minimum payments due under its SARM and SARD license agreements, GTx may be required to pay royalties on any net sales of product if GTx receives regulatory approval for a SARM, including enobosarm, or SARD product candidate and successfully market the product. Additionally, if GTx sublicenses rights under its SARM or SARD license agreements, it is also obligated to pay a sublicense royalty on any licensing fee or milestone payments it may receive from a sublicensee.

(2) GTx's operating lease obligations consist of payments relating to a lease for office space at 175 Toyota Plaza, Memphis, Tennessee, which expires on April 30, 2019.

Off-Balance Sheet Arrangements

GTx has not engaged in any off-balance sheet arrangements, including the use of standard finance, special purpose entities or variable interest entities.

ONCTERNAL MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

You should read the following discussion and analysis of Oncternal's financial condition and results of operations together with Oncternal's consolidated financial statements and related notes appearing in this proxy statement/prospectus/information statement. Some of the information contained in this discussion and analysis is set forth elsewhere in this prospectus, including information with respect to Oncternal's plans and strategy for Oncternal's business and related financing, includes forward-looking statements that involve risks and uncertainties. As a result of many factors, including those factors set forth in the "Risk factors" section of this registration statement/prospectus/information statement, Oncternal's actual results could differ materially from the results described in or implied by the forward-looking statements contained in the following discussion and analysis.

Overview

Oncternal is a clinical-stage biopharmaceutical company focused on developing first-in-class product candidates for cancers with critical unmet medical need. The company's development efforts are focused on promising, yet untreated biological pathways implicated in cancer generation or progression. ROR1 is a growth factor receptor that is widely expressed on many tumors and whose overexpression has been correlated with poor prognosis, which activates pathways that lead to increased tumor proliferation, invasiveness and drug resistance. Oncternal's lead product candidate is cirmtuzumab, a monoclonal antibody that is designed to inhibit the ROR1 receptor, which is being evaluated in a Phase 1b/2 clinical trial in combination with ibrutinib for the treatment of CLL and MCL, and in a Phase 1b clinical trial in combination with paclitaxel for women with metastatic breast cancer. Oncternal is also developing TK216, a small molecule that is designed to inhibit ETS, or E26 Transformation Specific, family oncoproteins, which alter gene transcription and RNA processing and lead to increased cell proliferation and invasion. TK216 is being evaluated in a Phase 1 clinical trial, alone and in combination with vincristine, in patients with relapsed or refractory Ewing sarcoma, a rare pediatric cancer. In addition, Oncternal is developing a CAR-T product candidate that targets ROR1, which is currently in preclinical development as a potential treatment for solid tumors and hematologic cancers including AML.

Since Oncternal's inception in 2013, it has devoted most of its resources to organizing and staffing, business planning, raising capital, acquiring product candidates and securing related intellectual property rights and advancing its cirmtuzumab and TK216 clinical development programs. Under research subaward agreements between Oncternal and UC San Diego, Oncternal is eligible to receive up to $16.1 million in development milestones throughout the award project period, estimated to be from October 1, 2017 to March 31, 2022. Through December 31, 2018, Oncternal has funded its operations primarily through: (i) gross proceeds of $49.0 million from the issuance of convertible preferred stock, and (ii) receipt of $4.0 million in subaward grant payments received from UC San Diego. As of December 31, 2018, Oncternal had cash and cash equivalents of $20.6 million.

Oncternal has incurred net losses in each year since inception. Oncternal's ability to generate product revenue sufficient to achieve profitability will depend heavily on the successful development and eventual commercialization of one or more of Oncternal's current or future product candidates. Oncternal's net losses were $6.6 million and $10.4 million for the years ended December 31, 2018 and 2017, respectively. As of December 31, 2018, Oncternal had an accumulated deficit of $31.4 million. Substantially all of Oncternal's net losses have resulted from costs incurred in connection with advancing Oncternal's research and development programs and from general and administrative costs associated with Oncternal's operations. Oncternal expects to continue to incur significant and increasing operating losses for at least the next several years. Oncternal expects that its expenses and capital funding requirements will increase substantially in connection with its ongoing activities, particularly if and as Oncternal:

- conducts its ongoing Phase 1b/2 clinical trial of cirmtuzumab and any additional clinical trials for its product candidates;

- continues to develop additional product candidates;
- advances preclinical studies for its CAR-T program;
- acquires or in-licenses other product candidates and technologies;
- maintains, expands and protects its intellectual property portfolio;
- establishes a commercial manufacturing source and secures supply chain capacity sufficient to provide commercial quantities of any product candidates for which it may obtain regulatory approval;
- seeks regulatory approvals for any product candidates that successfully complete clinical trials;
- establishes a sales, marketing and distribution infrastructure to commercialize any products for which it may obtain regulatory approval; and
- adds operational, financial and management information systems and personnel, including personnel to support its planned product development and future commercialization efforts, as well as to support its transition to a public reporting company.

Oncternal will not generate revenue from product sales unless and until Oncternal successfully completes clinical development and obtains regulatory approval for its product candidates. If Oncternal obtains regulatory approval for any of its product candidates and does not enter into a commercialization partnership, Oncternal expects to incur significant expenses related to developing Oncternal's internal commercialization capability to support product sales, marketing and distribution. Further, in the event the merger, as described below, occurs, Oncternal expects to incur additional costs associated with operating as a public company.

As a result, Oncternal believes it will need substantial additional funding to support its continuing operations and pursue its business strategy. Until such time as Oncternal can generate significant revenue from product sales, if ever, Oncternal expects to finance its operations through a combination of equity offerings, debt financings or other sources, including potentially government funding, collaborations, licenses and other similar arrangements. Oncternal may not be able to raise additional funds or enter into such other agreements or arrangements when needed on favorable terms, or at all. If Oncternal fails to raise capital or enter into such agreements as and when needed, Oncternal may have to significantly delay, reduce or eliminate the development and commercialization of one or more of its product candidates or delay its pursuit of potential in-licenses or acquisitions.

Because of the numerous risks and uncertainties associated with product development, Oncternal is unable to predict the timing or amount of increased expenses or when or if it will be able to achieve or maintain profitability. Even if Oncternal is able to generate product sales, Oncternal may not become profitable. If Oncternal fails to become profitable or is unable to sustain profitability on a continuing basis, then Oncternal may be unable to continue its operations at planned levels and be forced to reduce or terminate its operations.

Oncternal expects that its existing cash and cash equivalents will be sufficient to fund its operating expenses and capital expenditure requirements into the first quarter of 2020. Oncternal has based this estimate on assumptions that may prove to be wrong, and Oncternal could exhaust its available capital resources sooner than it expects. See "*Liquidity and Going Concern*." Beyond that point, Oncternal will need to raise additional capital to finance its operations, which cannot be assured. Oncternal has concluded that this circumstance raises substantial doubt about its ability to continue as a going concern within one year after the April 5, 2019 issuance date of its annual consolidated financial statements for the year ended December 31, 2018. See Note 1 of Oncternal's consolidated financial statements included elsewhere in this proxy statement/prospectus/information statement for additional information on its assessment.

Similarly, in its report on Oncternal's financial statements for the year ended December 31, 2018, Oncternal's independent registered public accounting firm included an explanatory paragraph stating that Oncternal's recurring losses from operations and required additional funding to finance Oncternal's operations raise substantial doubt about Oncternal's ability to continue as a going concern.

Proposed Merger with GTx

On March 6, 2019, GTx, Merger Sub and Oncternal entered into the Merger Agreement, pursuant to which Merger Sub, a wholly-owned subsidiary of GTx, will merge with and into Oncternal, with Oncternal continuing as a wholly-owned subsidiary of GTx and the surviving corporation of the merger. The merger is intended to qualify as a tax-free reorganization for U.S. federal income tax purposes. Under the exchange ratio formula in the Merger Agreement, the former Oncternal stockholders immediately before the merger are expected to own approximately 75% of the outstanding capital stock of GTx, and the stockholders of GTx immediately before the merger are expected to own approximately 25% of the outstanding capital stock of GTx, subject to certain assumptions and adjustments.

The merger is expected to be accounted for as a reverse asset acquisition in accordance with U.S. GAAP. Oncternal will be deemed to be the accounting acquirer for financial reporting purposes. This determination is supported based on the expectations that, immediately following the merger: (i) Oncternal stockholders will own a substantial majority of the voting rights of the combined organization; (ii) Oncternal will designate a majority (seven of nine) of the initial members of the board of directors of the combined organization; and (iii) Oncternal's senior management will hold all key positions in senior management of the combined organization and no employees will be retained from GTx. The transaction is expected to be accounted for as a reverse asset acquisition as the fair value of the acquired preclinical assets is deemed to be substantially concentrated in a group of similar assets that do not meet the definition of a business. Accordingly, for accounting purposes: (i) the merger will be treated as the equivalent of Oncternal issuing stock to acquire the net assets of GTx, (ii) the net assets of GTx will be recorded based upon the fair values in the financial statements at the time of closing and (iii) the reported historical operating results of the combined company prior to the merger will be those of Oncternal.

Components of Results of Operations

Grant Revenue

Oncternal has not generated any product revenue from product sales, and does not expect to generate any product revenue from the sale of products in the foreseeable future. If Oncternal's development efforts for its product candidates are successful and result in regulatory approval, Oncternal may generate revenue in the future from product sales. Oncternal cannot predict if, when, or to what extent it will generate revenue from the commercialization and sale of its product candidates. Oncternal may never succeed in obtaining regulatory approval for any of its product candidates. Oncternal's total revenue to date has been derived from a CIRM grant subaward with UC San Diego.

In August 2017, CIRM awarded an $18.3 million grant to researchers at UC San Diego, to advance Oncternal's Phase 1b/2 clinical trial evaluating cirmtuzumab in combination with ibrutinib for the treatment of patients with B-cell lymphoid malignancies, including MCL and CLL. Oncternal is conducting this study in collaboration with UC San Diego and estimates it will receive $16.1 million in development milestones under research subaward agreements throughout the award project period, estimated to be from October 1, 2017 to March 31, 2022. In addition, Oncternal is committed to certain co-funding requirements and is required to provide UC San Diego progress and financial update reports throughout the award project period. Oncternal received subaward payments of $0.5 million and $3.6 million in 2018 and 2017, respectively. As of December 31, 2018, Oncternal believes it has met its obligations under the CIRM award and UC San Diego subawards.

Operating Expenses

Research and Development

Research and development expenses consist primarily of costs incurred for the preclinical and clinical development of Oncternal's lead product candidate cirmtuzumab as well as TK216, which include:

- expenses under agreements with third-party contract organizations, investigative clinical trial sites that conduct research and development activities on Oncternal's behalf, and consultants;

- costs related to develop and manufacture preclinical study and clinical trial material;
- salaries and employee-related costs, including stock-based compensation;
- costs incurred under Oncternal's collaboration and third-party licensing agreements; and
- laboratory and vendor expenses related to the execution of preclinical and clinical trials.

Oncternal accrues all research and development costs in the period for which they are incurred. Costs for certain development activities are recognized based on an evaluation of the progress to completion of specific tasks using information and data provided to us by Oncternal's vendors, collaborators and third-party service providers. Advance payments for goods or services to be received in future periods for use in research and development activities are deferred and then expensed as the related goods are delivered and as services are performed.

Oncternal expects its research and development expenses to increase substantially for the foreseeable future as it continues to invest in developing Oncternal's product candidates, as Oncternal's product candidates advance into later stages of development, and as Oncternal begins to conduct larger clinical trials. Product candidates in later stages of clinical development generally have higher development costs than those in earlier stages of clinical development, primarily due to the increased size and duration of later-stage clinical trials.

Oncternal's direct research and development expenses are tracked by product candidate and consist primarily of external costs, such as fees paid under third-party license agreements and to outside consultants, CROs, CMOs and research laboratories in connection with its preclinical development, process development, manufacturing and clinical development activities. Oncternal does not allocate employee costs and costs associated with its discovery efforts, laboratory supplies and facilities, including other indirect costs, to specific product candidates because these costs are deployed across multiple programs and, as such, are not separately classified. Oncternal uses internal resources primarily to conduct its research as well as for managing its preclinical development, process development, manufacturing and clinical development activities. These employees work across multiple programs and, therefore, Oncternal does not track its costs by product candidate unless such costs are includable as subaward costs.

Oncternal cannot determine with certainty the timing of initiation, the duration or the completion costs of current or future preclinical studies and clinical trials of its product candidates due to the inherently unpredictable nature of preclinical and clinical development. Clinical and preclinical development timelines, the probability of success and development costs can differ materially from expectations. Oncternal anticipates that it will make determinations as to which product candidates to pursue and how much funding to direct to each product candidate on an ongoing basis in response to the results of ongoing and future preclinical studies and clinical trials, regulatory developments and Oncternal's ongoing assessments as to each product candidate's commercial potential. Oncternal will need to raise substantial additional capital in the future. In addition, Oncternal cannot forecast which product candidates may be subject to future collaborations, when such arrangements will be secured, if at all, and to what degree such arrangements would affect its development plans and capital requirements.

General and Administrative

General and administrative expenses consist primarily of personnel-related costs, and professional fees for legal, patent, consulting, investor and public relations, accounting and audit services. Personnel-related costs consist of salaries, benefits and stock-based compensation.

Other Income (Expense), Net

Change in Fair Value of Preferred Stock Warrant Liability

In connection with Oncternal's Series B and Series B-2 preferred stock financings in 2017, Oncternal issued warrants to purchase shares of its preferred stock. Oncternal classifies these warrants as a liability on its

consolidated balance sheets and remeasures to fair value at each reporting date, and Oncternal recognizes changes in the fair value of the warrant liability as a component of other income (expense), net in its consolidated statements of operations. Oncternal will continue to recognize changes in the fair value of each warrant comprising the warrant liability until each respective warrant is exercised, expires or qualifies for equity classification.

Upon the closing of the merger, all of Oncternal's outstanding preferred stock warrants will become exercisable for GTx common stock and are expected to qualify for equity classification. As a result, the preferred stock warrants will no longer require liability accounting and the fair value of the warrant liability upon the closing of the merger will be reclassified to additional paid-in capital.

Interest Income

Interest income consists of interest earned on Oncternal's cash equivalents, which consist of money market funds. Oncternal's interest income has not been significant due to low interest rates earned on invested balances.

Results of Operations

Comparison of Years Ended December 31, 2018 and 2017

The following table summarizes Oncternal's results of operations for the years ended December 31, 2018 and 2017:

	Years Ended December 31,		
	2018	2017	Change
	(in thousands)		
Grant revenues	$ 2,521	$ 1,674	$ 847
Operating expenses:			
Research and development	8,287	9,363	(1,076)
General and administrative	1,820	2,871	(1,051)
Total operating expenses	10,107	12,234	(2,127)
Loss from operations	(7,586)	(10,560)	2,974
Other income (expense):			
Change in fair value of warrant liability	713	124	589
Other income	216	—	216
Interest income	79	10	69
Interest expense	(1)	(10)	9
Total other income (expense)	1,007	124	883
Net loss	$ (6,579)	$(10,436)	$ 3,857

Grant Revenue

Grant revenue for the year ended December 31, 2018 was $2.5 million, compared to $1.7 million for the year ended December 31, 2017. The increase was driven by higher qualifying subaward costs in 2018 over 2017.

Research and Development Expenses

The following table summarizes Oncternal's research and development expenses for the periods indicated:

	Years Ended December 31,		Increase/ (Decrease)
	2018	2017	
	(in thousands)		
Cirmtuzumab	$ 5,561	$ 6,143	$ (582)
TK216	1,465	1,601	(136)
Unallocated research and development expenses	1,261	1,619	(358)
Total research and development expenses	$ 8,287	$ 9,363	$ (1,076)

Research and development expenses for the 12 months ended December 31, 2018 and 2017 were $8.3 million and $9.4 million, respectively, a decrease of $1.1 million. The decrease was due to a $0.7 million decrease in direct product candidate costs and a $0.4 million decrease in unallocated research and development expenses.

Direct expenses of the cirmtuzumab product candidate decreased $0.6 million for the year ended December 31, 2018, compared to the year ended December 31, 2017, due primarily to the following partially offsetting factors: (i) a $1.3 million decrease in preclinical development expenses as Oncternal amended its Regents research agreement in August 2018 and reduced its preclinical program activities as Oncternal transitioned into clinical trial activities, (ii) a $2.1 million increase in clinical trial activities related to Oncternal's Phase 1/2 clinical trial of cirmtuzumab, in combination with ibrutinib for the treatment of patients with B-cell lymphoid malignancies, including MCL and CLL, that commenced in the latter part of 2017 and continued through 2018, (iii) a $0.9 million decrease in manufacturing costs, primarily due to a non-recurring cell-line optimization costs incurred in 2017, and (iv) a $0.5 million decrease in consultant costs as Oncternal reduced its use of consultants to support its preclinical and clinical activities.

Direct expenses of the TK216 product candidates decreased $0.1 million for the year ended December 31, 2018, compared to the year ended December 31, 2017, due primarily to the following partially offsetting factors: (i) a $0.1 million decrease in preclinical development expenses as Oncternal generally reduced its preclinical program activities, (ii) a $0.5 million increase in clinical trial activities related to Oncternal's continuing Phase 1 clinical trial of TK216 in refractory Ewing sarcoma, and (iii) a $0.5 million decrease in manufacturing costs, primarily due to a non-recurring clinical trial material batch purchased in 2017.

Unallocated research and development expenses decreased of $0.4 million for the years ended December 31, 2018 and 2017 primarily due to lower personnel costs resulting from entering into the VelosBio transition services agreement, as further described in the "*Contractual Obligations"* section below.

General and Administrative Expenses

General and administrative expenses for the years ended December 31, 2018 and 2017 were $1.8 million and $2.9 million, respectively, a decrease of $1.1 million. The decrease is primarily due to legal expenses decreasing $1.0 million resulting from Oncternal's efforts to significantly expand its intellectual property portfolio on the cirmtuzumab platform and product candidates in 2017.

Other Income (Expense), Net

Other income, net was $1.0 million for the year ended December 31, 2018, compared to $0.1 million for the year ended December 31, 2017. The increase in other income, net of $0.9 million was primarily due to: (i) a $0.6 million decrease in the fair value of the preferred stock warrant liability, and (ii) a gain of $0.2 million related to the VelosBio asset purchase agreement, as further described in the "*Contractual Obligations"* section below.

Liquidity and Going Concern

From its inception through December 31, 2018, Oncternal has devoted substantially all of its efforts to organizational activities including raising capital, building infrastructure, acquiring assets, developing intellectual property, and conducting preclinical studies, clinical trials and product development activities. Oncternal has a limited operating history and the sales and income potential of Oncternal's business and market are unproven. Oncternal has experienced recurring net losses and negative cash flows from operating activities. At December 31, 2018, Oncternal had an accumulated deficit of $31.4 million and had cash and cash equivalents of $20.6 million. Oncternal will need to continue to raise a substantial amount of funds until it is able to generate revenues to fund its development and operating activities.

Oncternal expects to continue to incur net losses into the foreseeable future. Successful transition to attaining profitable operations is dependent upon achieving a level of revenues adequate to support Oncternal's cost structure. Oncternal has incurred net losses since inception and has relied on its ability to fund its operations through debt and equity financings and grant funding. These conditions raise substantial doubt about Oncternal's ability to continue as a going concern. The accompanying consolidated financial statements have been prepared assuming that Oncternal will continue as a going concern and do not include any adjustments that might result from the outcome of this uncertainty. This basis of accounting contemplates the recovery of Oncternal's assets and the satisfaction of liabilities in the normal course of business.

Oncternal plans to continue to fund its losses from operations and capital funding needs through a combination of equity offerings, debt financings, government funding, or other sources, including potentially collaborations, licenses and other similar arrangements. There can be no assurance that Oncternal will be able to obtain any sources of financing on acceptable terms, or at all. To the extent that Oncternal can raise additional funds by issuing equity securities, Oncternal's stockholders may experience significant dilution. Any debt financing, if available, may involve restrictive covenants that impact Oncternal's ability to conduct its business.

Cash Flows

The following table summarizes Oncternal's sources and uses of cash for each of the periods presented:

	Years Ended December 31,	
	2018	2017
	(in thousands)	
Net cash provided by (used in):		
Operating activities	$ (7,417)	$ (9,135)
Financing activities	17,874	11,405
Net increase in cash and cash equivalents	$ 10,457	$ 2,270

Operating activities

During the year ended December 31, 2018, operating activities used $7.4 million of cash, resulting primarily from Oncternal's net loss of $6.6 million, non-cash change in fair value of warrant liability of $0.7 million and non-cash other income of $0.2 million, a $0.1 million change in operating assets and liabilities, partially offset by stock-based compensation charges of $0.2 million. The $0.1 million change in operating assets and liabilities primarily consisted of a $0.4 million increase in prepaid expenses and other assets, a $1.9 million decrease in deferred revenue, offset by a $2.2 million increase in accounts payable and accrued expenses.

During the year ended December 31, 2017, operating activities used $9.1 million of cash, resulting from Oncternal's net loss of $10.4 million, non-cash change in fair value of warrant liability of $0.1 million, partially offset by a $1.1 million change in operating assets and liabilities, and stock-based compensation charges of $0.3 million. The $1.1 million change in operating assets and liabilities for the year ended December 31, 2017 primarily consisted of a $0.6 million increase in prepaid expenses and other assets, a $1.9 million increase in deferred revenue, and a $0.2 million decrease in accounts payable and accrued expenses.

Financing activities

Net cash provided by financing activities was $17.9 million for the year ended December 31, 2018 consisting of net proceeds of $16.8 million from Oncternal's sale of Series C convertible preferred stock in November 2018 and the collection of $1.1 million of Series B-2 convertible preferred stock subscriptions receivable. Net cash provided by financing activities was $11.4 million for the year ended December 31, 2017 consisting of net proceeds from Oncternal's sale of Series B and Series B-2 convertible preferred stock.

Oncternal believes that its existing cash and cash equivalents will be sufficient to meet its anticipated cash requirements into the first quarter of 2020. However, Oncternal's forecast of the period of time through which its financial resources will be adequate to support its operations is a forward-looking statement that involves risks and uncertainties, and actual results could vary materially. Oncternal has based this estimate on assumptions that may prove to be wrong, and it could use its capital resources sooner than we expect. Additionally, the process of testing product candidates in clinical trials is costly, and the timing of progress and expenses in these trials is uncertain.

Oncternal's future capital requirements will depend on many factors, including:

- the type, number, scope, progress, expansions, results, costs and timing of, its preclinical studies and clinical trials of its product candidates which it is pursuing or may choose to pursue in the future;
- the costs and timing of manufacturing for its product candidates, including commercial manufacturing if any product candidate is approved;
- the costs, timing and outcome of regulatory review of its product candidates;
- the costs of obtaining, maintaining and enforcing its patents and other intellectual property rights;
- its efforts to enhance operational systems and hire additional personnel to satisfy its obligations as a public company, including enhanced internal controls over financial reporting;
- the costs associated with hiring additional personnel and consultants as its preclinical and clinical activities increase;
- the costs and timing of establishing or securing sales and marketing capabilities if any product candidate is approved;
- its ability to achieve sufficient market acceptance, adequate coverage and reimbursement from third-party payors and adequate market share and revenue for any approved products;
- the terms and timing of establishing and maintaining collaborations, licenses and other similar arrangements; and
- costs associated with any products or technologies that it may in-license or acquire.

Until such time, if ever, as Oncternal can generate substantial product revenues to support its cost structure, it expects to finance its losses from operations and capital funding needs through a combination of equity offerings debt financings or other sources, including potentially government funding, collaborations, licenses and other similar arrangements. To the extent that Oncternal raises additional capital through the sale of equity or debt securities, the ownership interest of its stockholders will be or could be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect the rights of its common stockholders. Debt financing and preferred equity financing, if available, may involve agreements that include covenants limiting or restricting Oncternal's ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends. If Oncternal raises funds through collaborations, licenses and other similar arrangements with third parties, it may have to relinquish valuable rights to our technologies, future revenue streams, research programs or product candidates or grant licenses on terms that may not be favorable to it and/or may reduce the value of its common stock. If Oncternal is unable to raise additional funds through equity or debt

financings when needed, it may be required to delay, limit, reduce or terminate its product development or future commercialization efforts or grant rights to develop and market its product candidates even if it would otherwise prefer to develop and market such product candidates by itself. There can be no assurance that Oncternal will be able to obtain any sources of financing on acceptable terms, or at all.

Contractual Obligations and Commitments

Georgetown University ("Georgetown")

In March 2014, Oncternal entered into an Exclusive License Agreement (the "Georgetown License Agreement") with Georgetown, pursuant to which Oncternal: (i) licensed the exclusive worldwide right to patents and technologies for the development and commercialization of certain product candidates targeting EWS-FLI1 as an anti-tumor therapy for therapeutic, diagnostics, or research tool purposes, (ii) is solely responsible for all development and commercialization activities and costs in its respective territories, and (iii) is also responsible for all costs related to the filing, prosecution and maintenance of the licensed patent rights.

Under the terms of the Georgetown License Agreement, commencing in 2015, Oncternal: (i) shall pay and has paid an annual license maintenance fee of $10,000 until the first commercial sale occurs, (ii) is required to make up to $200,000 in aggregate milestone payments upon the achievement of certain regulatory milestones, and (iii) will be required to pay low single digit royalties based on annual net product sales. Oncternal accounted for the licensed technology as an asset acquisition because it did not meet the definition of a business. All milestone payments under the Georgetown License Agreement will be recognized as research and development expense upon completion of the required events, as the triggering events are not considered to be probable until they are achieved. As of December 31, 2018, Oncternal had not triggered or made any milestone payments under the Georgetown License Agreement.

The Georgetown License Agreement may be terminated by either party upon material breach or may be terminated by Oncternal as to one or more countries with 90 days written notice of termination. The term of the Georgetown License Agreement will continue until the expiration of the last valid claim within the patent rights covering the product. Georgetown may terminate the agreement in the event (i) Oncternal fails to pay any amount and fails to cure such failure within 30 days after receipt of notice, (ii) Oncternal defaults in its obligation to obtain and maintain insurance and fails to remedy such breach within 60 days after receipt of notice, or (iii) Oncternal declares insolvency or bankruptcy. Oncternal may terminate the agreement at any time upon at least 60 days' written notice.

In 2017, Oncternal entered into a research agreement with Georgetown for up to $150,000. For the years ended December 31, 2018 and 2017, Oncternal recorded research and development expenses of $53,000 and $75,000, respectively.

The University of Texas MD Anderson Cancer Center ("MD Anderson")

In December 2014, Oncternal entered into a collaboration agreement (the "MD Anderson Collaboration") with MD Anderson, which, as amended, provides for the conduct of preclinical and clinical research on TK216 in exchange for certain program payments. If MD Anderson successfully completes all the requirements of the MD Anderson Collaboration in full and the program is successfully commercialized, Oncternal will be required to pay aggregate milestone payments of $1.0 million based on net product sales. For the years ended December 31, 2018 and 2017, Oncternal recorded $330,000 and $0, respectively, of research and development expenses earned by MD Anderson under the MD Anderson Collaboration agreement.

Agreements with the Regents of the University of California (the "Regents")

In March 2016, Oncternal entered into a license agreement with the Regents, which was amended and restated in August 2018, for the development, manufacturing and distribution rights to naked antibodies, including

cirmtuzumab and genetically engineered cellular therapy products, including CAR-T products that are covered by licensed patents for all human therapeutic, diagnostic and preventive applications in all indications.

The Regents License Agreement provides for the following: (i) in May 2016, an upfront license fee of $0.5 million was paid and 1,459,524 shares of Oncternal common stock were issued, (ii) $25,000 in annual license maintenance fees commencing in 2017, (iii) reimbursement of up to $30,000 in annual patent costs, (iv) certain development and regulatory milestones aggregating from $10.0 million to $12.5 million, on a per product basis, (v) certain worldwide sales milestones based on achievement of tiered revenue levels aggregating $75.0 million, (vi) low single-digit royalties, including potential future minimum annual royalties, on net sales of each target, and (vii) minimum diligence to advance licensed assets consisting of at least $1.0 million in development spend annually through 2021. Under the Regents License Agreement in 2018 and 2017, Oncternal recorded: (i) $25,000 in annual license maintenance fees recorded as research and development expense, and (ii) $0.1 million and $0.2 million in patent costs recorded as general and administrative expense for the years ended December 31, 2018 and 2017, respectively. As of December 31, 2018, Oncternal believes it has met its obligations under the Regents License Agreement.

In July 2016, and as modified by the amended and restated Regents License Agreement in August 2018, Oncternal entered into a Research Agreement (the “Research Agreement”) with the Regents for further research on a ROR1 therapeutic development program. Under this five-year agreement, the Regents will have an aggregate budget of $2.5 million, with $125,000 payable quarterly. For the years ended December 31, 2018 and 2017, Oncternal recorded $0.5 million and $1.0 million, respectively, in research and development costs under this Research Agreement. Such costs are includable as part of Oncternal’s annual diligence obligations under the Regents License Agreement.

The Regents License Agreement will expire upon the later of the expiration date of the longest-lived patent rights or the 15th anniversary of the first commercial sale of a licensed product. The Regents may terminate the Regents License Agreement if: (i) a material breach by Oncternal is not cured within a reasonable time, (ii) Oncternal files a claim asserting the Regents licensed patent rights are invalid or unenforceable, and (iii) Oncternal files for bankruptcy. Oncternal may terminate the agreement at any time upon at least 60 days’ written notice.

In September 2016, Oncternal entered into an Investigator-Initiated Clinical Trial Agreement with the Regents to provide partial support for a Phase I clinical study to determine the safety and tolerability of cirmtuzumab for the treatment of patients with relapsed or refractory CLL. Under this agreement that was concluded in 2017, Oncternal recorded $0.2 million in research and development expenses for the year ended December 31, 2017.

Velos Biopharma Holdings, LLC (“VBH”) and VelosBio, Inc. (“VelosBio”) Spin-off Transactions

In November and December 2017, Oncternal formed VBH and made an in-kind tax-free distribution of 100% of its interest in VBH to Oncternal’s stockholders, option holders and warrant holders of record. On February 6, 2018, Oncternal licensed and assigned its rights to two preclinical product candidates, previously under the Regents License Agreement, to VBH. In consideration for the license, Oncternal: (i) received a promissory note receivable from VBH of $0.1 million, with an annual interest rate of 2.64% and a due date of 10 years, and (ii) made a partial assignment of its March 2016 Regents License Agreement. Pursuant to the partial assignment, VBH assumed certain obligations related to the licensed Products under the Regents License Agreement as follows: (i) reimbursement of certain historical and future patent costs related to the Products, (ii) certain development and sales milestones for advancing licensed Products targets, (iii) low single-digit royalties, including potential future minimum annual royalties, on net sales of each licensed Product target are to be allocated between Oncternal and VBH, (iv) certain third-party agreements and related obligations specifically related to the licensed Products, (v) minimum diligence requirements to advance licensed assets consisting of a minimum of $0.5 million in development spend annually through 2021, and (vi) Research Agreement obligations equal to $0.5 million annually commencing January 1, 2018. Due to the high uncertainty of the success of VBH

ever repaying the note and associated interest, Oncternal has provided a full valuation allowance for these amounts as of December 31, 2018.

In December 2017, VelosBio was incorporated with VBH being its sole stockholder with VelosBio common shares only. On February 6, 2018, VBH sublicensed and assigned its intellectual property rights to its two preclinical product candidates to VelosBio. In consideration for the license, VelosBio agreed to use commercially reasonable efforts to develop the licensed products as well as the following payment obligations: (i) the assumption of each of the VBH assumed obligations under the partial assignment between Oncternal and VBH as outlined above, and (ii) certain tiered development milestone and royalty payments to VBH. In August 2018, Oncternal entered into the amended and restated Regents License Agreement and VelosBio entered into their own license agreement directly with the Regents. In 2018, VelosBio secured substantially independent preferred stock financings for its programs and there is no common control overlap between the companies.

Also on February 6, 2018, Oncternal and VelosBio entered into: (i) an asset purchase agreement whereby VelosBio purchased Oncternal's right, title and interest in Oncternal's nominal assets related to the two preclinical product candidates and assumed Oncternal's $0.2 million convertible note payable and related $16,000 of accrued interest which has been recorded as other income in Oncternal's consolidated financial statements, and (ii) a transition services agreement whereby Oncternal agreed to provide VelosBio with certain transition services, which expired as of December 31, 2018, as follows: (i) access to certain common laboratory equipment at Oncternal's lab facility, (ii) certain named employees were to devote up to 80% of their time supporting VelosBio related activities, (iii) cirmtuzumab manufacturing, process optimization and ancillary activities until VelosBio was able to establish their own, and (iv) agreement to cost share the purchase of certain antibody materials with VelosBio. Such services were to be provided at cost or cost plus. During 2018, Oncternal incurred $3.0 million of costs on behalf of VelosBio that were substantially reimbursed and recorded on a net basis within operating expenses. As of December 31, 2018, there are no ongoing rights or commitments under the asset purchase or transition services agreements.

SPH USA License Agreement

In November 2018, Oncternal entered into the SPH USA License Agreement with SPH USA for: (i) the territory of Greater China, and (ii) rights to manufacture, develop, market, distribute and sell all of Oncternal's product candidates under the Georgetown License Agreement and the Regents License Agreement (exclusive to Greater China only). Under the SPH USA License Agreement, SPH USA is solely responsible for: (a) all preclinical and clinical development activities specific to obtaining regulatory approval in Greater China for such product candidates, (b) any third-party license milestone or royalty payments owed under the License Agreement and the Regents License Agreement, and (c) paying Oncternal a low single digit royalty on net sales in the territory.

Government Contracts, Grant Agreements and Incentive Programs

The California Institute for Regenerative Medicine ("CIRM") Award

In August 2017, CIRM awarded an $18.3 million grant to researchers at UC San Diego, to advance Oncternal's Phase 1b/2 clinical trial evaluating cirmtuzumab in combination with ibrutinib for the treatment of patients with B-cell lymphoid malignancies, including MCL and CLL. Oncternal: (i) is conducting this study in collaboration with UC San Diego, (ii) estimates it will receive $16.1 million in development milestones under research subaward agreements throughout the award project period, estimated to be from October 1, 2017 to March 31, 2022, (iii) is committed to certain co-funding requirements, (iv) received subaward payments of $0.5 million and $3.6 million in December 2018 and 2017, respectively, and (v) is required to provide UC San Diego progress and financial update reports throughout the award project period. The subaward does not bear a royalty payment commitment, nor is the subaward otherwise refundable. For the years ended December 31, 2018 and 2017, Oncternal recorded revenue of $2.5 million and $1.7 million, respectively. Related qualifying subaward costs during the years ending December 31, 2018 and 2017 were $5.7 million and $3.1 million, respectively. As of December 31, 2018, Oncternal believes it has met its obligations under the CIRM award and UC San Diego subawards to date.

Critical Accounting Policies

Oncternal management's discussion and analysis of Oncternal's financial condition and results of operations are based on its consolidated financial statements, which have been prepared in accordance with United States generally accepted accounting principles ("U.S. GAAP"). The preparation of the financial statements requires Oncternal to make estimates and judgments that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the financial statements, as well as the reported expenses incurred during the reporting periods. Oncternal estimates are based on its historical trends and other factors that it believes are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying value of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions.

Oncternal's significant accounting policies are described in more detail in Note 1, "*Description of Business, Basis of Presentation and Summary of Significant Accounting Policies*," in the notes to its consolidated financial statements as of December 31, 2018 and 2017 and for each of the years ended December 31, 2018 and 2017, appearing elsewhere in this proxy statement/prospectus/information statement. However, Oncternal believes that the following accounting policies are the most critical for fully understanding and evaluating our financial condition and results of operations.

Research and Development Expenses and Accruals

Research and development expenses consist of costs incurred for Oncternal's own and for sponsored and collaborative research and development activities. Research and development costs are expensed as incurred and include manufacturing drug product, costs associated with preclinical studies and clinical trials, regulatory and medical affairs activities, quality assurance activities, salaries and benefits, including stock-based compensation, fees paid to third-party consultants, license fees and overhead.

Oncternal has entered into various research and development contracts with research institutions, clinical research organizations, clinical manufacturing organizations and other companies. Payments for these activities are based on the terms of the individual agreements, which may differ from the pattern of costs incurred, and payments made in advance of performance are reflected in the consolidated balance sheets as prepaid expenses and other assets or accrued liabilities. Oncternal records accruals for estimated costs incurred for ongoing research and development activities. When evaluating the adequacy of the accrued liabilities, Oncternal analyzes progress of the services, including the phase or completion of events, invoices received and contracted costs. Significant judgments and estimates may be made in determining the prepaid or accrued balances at the end of any reporting period. Actual results could differ from Oncternal's estimates.

Valuation of Warrants to Purchase Convertible Preferred Stock

Oncternal has classified warrants to purchase shares of its Series B-2 convertible preferred stock as a liability on its consolidated balance sheets as these warrants were free-standing financial instruments exercisable into contingently redeemable shares. The warrants were initially recorded at fair value on the date of grant, and were subsequently remeasured to fair value at each balance sheet date while the instrument was outstanding. Changes in fair value of these warrants were recognized as a component of other income (expense), net in Oncternal's consolidated statements of operations.

Oncternal used the Black-Scholes option-pricing model, which incorporates assumptions and estimates, to value the preferred stock warrants. Oncternal assessed these assumptions and estimates on a quarterly basis as additional information impacting the assumptions was obtained. Estimates and assumptions impacting the fair value measurement included the fair value per share of the underlying convertible preferred stock, the remaining contractual term of the warrant, risk-free interest rate, expected dividend yield and expected volatility of the price of the underlying preferred stock. Oncternal determined the fair value per share of the underlying preferred stock

by taking into consideration Oncternal's most recent sales of its convertible preferred stock, results obtained from third-party valuations and additional factors that Oncternal deemed relevant. During the period that these instruments were outstanding, Oncternal had historically been a private company and lacked company-specific historical and implied volatility information of its stock. Therefore, Oncternal estimated expected stock volatility based on the historical volatility of publicly traded peer companies for a term equal to the remaining contractual term of the warrants. The risk-free interest rate was determined by reference to the U.S. Treasury yield curve for time periods approximately equal to the remaining contractual term of the warrants. Oncternal estimated a 0% dividend yield based on the expected dividend yield and the fact that it has never paid or declared cash dividends. Significant changes to the fair value of the underlying stock would have resulted in a significant change in the fair value measurements.

Revenue Recognition

Oncternal currently generates revenue from a research subaward agreement with UC San Diego, which provides Oncternal with payments for certain types of expenditures in return for research and development activities over a contractually defined period. Revenue from such subaward is recognized in the period during which the related qualifying costs are incurred and services are rendered, provided that the applicable conditions under the subaward agreement have been met.

QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISKS

GTx is a smaller reporting company, as defined by Rule 12b-2 of the Securities Exchange Act of 1934, as amended, and is not required to provide the information required under this item.

MANAGEMENT PRIOR TO AND FOLLOWING THE MERGER

Executive Officers and Directors of GTx Prior to the Merger

Directors of GTx Prior to the Merger

Michael G. Carter, M.D., Ch.B., F.R.C. P

Dr. Carter, age 81, was appointed as a GTx director in May 2006 and currently serves as Chair of the GTx Compensation Committee and as a member of both the GTx Audit Committee and the GTx Scientific and Development Committee. Dr. Carter was a non-executive director of Santarus, Inc. from 2004 to 2013, served as a non-executive director of Micromet AG from 2001 to 2005 and of MICROMET, Inc. from 2006 to March 2012, and served as a non-executive director of Fulcrum Pharma, PLC from 2005 to 2010. Dr. Carter was a member of the Advisory Board of Paul Capital Royalty Fund from 2005 to 2008, and was a venture partner with SV Life Sciences Advisors, LLP from 1998 to 2016. He has served as a member of the strategic advisory board of Healthcare Royalty Partners (HCRP) since September 2009 and a member of the HCRP Investment Committee since 2015. Dr. Carter was the non-executive chairman of Metris Therapeutics, Ltd., a biotechnology firm specializing in women's healthcare from 1999 to 2008. He was also a non-executive director of ONCOETHIX from June 2013 until its sale to Merck & Co., in December 2014. Dr. Carter served on the Pharmaceutical Board of I.C.I. Zeneca Pharmaceuticals, a predecessor company of AstraZeneca, and held various positions with I.C.I. Zeneca from 1984 to 1998, including International Medical Director and International Marketing Director. From 1985 to 1995, Dr. Carter served as a member of the U.K. Government's Medicines Commission. Dr. Carter is an Elected Fellow of the Royal Pharmaceutical Society, Faculty of Pharmaceutical Medicine, and of the Royal College of Physicians of Edinburgh. Dr. Carter holds a degree in pharmacy from London University (U.K.) and a medical degree from Sheffield University Medical School (U.K.). Dr. Carter brings to the GTx Board specific expertise in the development and commercialization of pharmaceutical products by both large pharmaceutical companies and small specialty biotech companies.

J. Kenneth Glass

Mr. Glass, age 72, has served as a GTx director since March 2004, and currently serves as the Chair of the GTx Audit Committee and also currently serves on the GTx Compensation Committee. Mr. Glass retired as Chairman of the Board, President and Chief Executive Officer of First Horizon National Corporation (NYSE: FHN), or First Horizon, as of January 29, 2007. Mr. Glass was named President and Chief Executive Officer of First Horizon in July 2002, and he also became First Horizon's Chairman of the Board in January 2004. From 2003 through 2007, Mr. Glass served as a director of FedEx Corporation (NYSE: FDX). From July 2001 through July 2002, Mr. Glass was President and Chief Operating Officer of First Horizon. From 1993 to 2001, Mr. Glass was Business Unit President of First Tennessee Bank. Mr. Glass received his B.A. in Accounting from Harding University and graduated from Harvard Business School's Advanced Management Program. With his background in accounting and as a Chief Executive Officer, Mr. Glass serves in the role of a financial expert for our Audit Committee, and his years of experience leading a publicly-owned bank holding company has provided him with the organizational skills, risk management expertise and leadership he currently brings to the GTx Board and the Audit Committee.

Marc S. Hanover

Mr. Hanover, age 56, a co-founder of GTx, served as GTx's President and Chief Operating Officer from its inception in September 1997 until his appointment as GTx's permanent Chief Executive Officer in February 2015, and served as its acting Principal Financial Officer from December 31, 2013 until his appointment as its interim Chief Executive Officer on April 3, 2014. He also previously served as a member of the GTx Board from September 1997 to August 2011. Prior to joining GTx, Mr. Hanover was a founder of Equity Partners International, Inc., a private equity firm in Memphis, Tennessee, and participated as a founder and investor in three healthcare companies. From 1985 to 1997, Mr. Hanover was a Senior Vice President and a member of the

Executive Management Committee of National Bank of Commerce in Memphis, Tennessee. Mr. Hanover holds a B.S. in Biology from the University of Memphis and an MBA in Finance from the University of Memphis. Mr. Hanover serves as the GTx Chief Executive Officer and he is responsible for overseeing all aspects of our business, including product development and business strategies. Accordingly, the GTx Nominating and Corporate Governance Committee and the GTx Board has determined that Mr. Hanover should serve as a member of tthe GTx Board since he is best able to impart to the GTx Board the business and financial acumen essential for a complete understanding by the GTx Board's operations, strategies and developmental plans.

J. R. Hyde, III

Mr. Hyde, age 76, has served as a GTx director since November 2000, and currently serves as a member of the GTx Compensation Committee and the GTx Nominating and Corporate Governance Committee. From November 2000 to March 2015, Mr. Hyde served as non-executive Chairman of the GTx Board. In connection with Dr. Wills' assumption of duties as the GTx Executive Chairman in March 2015, Mr. Hyde was appointed as GTx's Lead Director. Since 1989, Mr. Hyde has been the sole stockholder and President of Pittco Holdings, Inc., a private institutional investment company. Since 1996, when Mr. Hyde made a substantial contribution to support the research of GTx's prior CEO, Mr. Hyde has been instrumental in forming and financing GTx and is GTx's largest stockholder. Mr. Hyde was the Chairman of the Board of Directors of AutoZone, Inc. (NYSE: AZO) from 1986 to 1997 and the Chief Executive Officer of AutoZone from 1986 to 1996. From March 2005 to June 2007, Mr. Hyde served as the non-executive chairman of the Board of Directors of AutoZone, Inc. He was also Chairman and Chief Executive Officer of Malone & Hyde, Inc., AutoZone's former parent company, from 1972 until 1988. Mr. Hyde also served as a director of FedEx Corporation (NYSE: FDX) from 1977 to 2011. As the largest stockholder of GTx and with a long history of serving as both Chairman and Chief Executive Officer of a large publicly-traded company and a member of the board of directors of other public companies, Mr. Hyde has continued to serve as a principal architect of the GTx public company governance structure, and continues to be a primary advisor to senior management on all matters of strategic importance. The GTx Board believes that Mr. Hyde's leadership role and public company experience, as well as his significant ownership interest in the company, qualifies him to serve as the Lead Director of the GTx Board.

Garry A. Neil, M.D.

Dr. Neil, age 65, has served as a GTx director since August 2016 and currently serves as a member of the GTx Nominating and Corporate Governance Committee and the GTx Board's Scientific and Development Committee. Dr. Neil joined as CSO of Aevi Genomic Medicine in September 2013. Prior to joining Aevi Genomic Medicine, Dr. Neil held a number of senior positions in the pharmaceutical industry, academia and venture capital. These include Corporate Vice President of Science & Technology at Johnson & Johnson and Group President at Johnson & Johnson Pharmaceutical Research and Development, Vice President of Research and Development at Merck KGaA/EMD Pharmaceuticals, Vice President of Clinical Research at Astra Zeneca and Astra Merck. Under his leadership a number of important new medicines for the treatment of cancer, anemia, infections, central nervous system and psychiatric disorders, pain, and genitourinary and gastrointestinal diseases gained initial or expanded approvals. Dr. Neil holds a B.S. from the University of Saskatchewan and an M.D. from the University of Saskatchewan College of Medicine. He completed postdoctoral clinical training in internal medicine and gastroenterology at the University of Toronto. Dr. Neil also completed a postdoctoral research fellowship at the Research Institute of Scripps Clinic. He is the Founding Chairman of the Pharmaceutical Industry R&D Consortium, TransCelerate Biopharmaceuticals Inc., and remains on the Board. He also serves on the Boards of Reagan Udall Foundation, Arena Pharmaceuticals (Nasdaq: ARNA) and is a past member of the Board of Foundation for the National Institutes of Health (FNIH), and the Science Management Review Board of the NIH. He is past Chairman of the Pharmaceutical Research and Manufacturers Association (PhRMA) Science and Regulatory Executive Committee and the PhRMA Foundation Board. The GTx Nominating and Corporate Governance Committee and the GTx Board finds Dr. Neil's experience and background in drug development and regulatory interactions helpful on the GTx Board.

Kenneth S. Robinson, M.D., M.Div.

Dr. Robinson, age 64, has served as a GTx director since May 2008 and currently serves as Chair of the GTx Nominating and Corporate Governance Committee and as a member of the GTx Audit Committee. From 2003 through 2007, Dr. Robinson served in the cabinet of Tennessee Governor Phil Bredesen as Commissioner of Health, and in April 2009, Dr. Robinson accepted an appointment to provide executive-level public health leadership and consultation as the Health Officer of Shelby County, Tennessee, the county in which GTx is located. In February 2011, Dr. Robinson was appointed as Public Health Policy Advisor for Shelby County, Tennessee. From 1982 through 1991, Dr. Robinson taught and practiced internal medicine at Vanderbilt University School of Medicine, and from 1991 through 2003, he was an Assistant Dean at the University of Tennessee College of Medicine. Since 2015, he has served as President and CEO of United Way of the Mid-South. Dr. Robinson holds a B.A., cum laude, from Harvard University, a M.D. from Harvard Medical School, and a Master of Divinity from Vanderbilt Divinity School. As a Harvard-trained physician who has experience in overseeing the complexities of federal and state agencies' provision of healthcare to elderly and indigent patients, Dr. Robinson brings to the GTx Board expertise in governance, governmental reimbursement related issues, population health data and priorities, and the role of government in the development and delivery of healthcare services. Dr. Robinson, an African-American, adds an element of racial balance to the GTx Board and also provides a voice for GTx with state and local officials.

Robert J. Wills, Ph.D.

Dr. Wills, age 65, has over three decades of experience as a leader in the pharmaceutical and biotechnology industry. Dr. Wills joined GTx as the Executive Chairman of the Board of Directors and as Chairman of the GTx Board's Scientific and Development Committee on March 2, 2015. He also serves as Chairman of the Board of CymaBay Therapeutics, as board member at Parion Sciences, Inc., as board member at Go Therapeutics and as a member of the Emerging Companies Section Governing Board of Biotechnology Innovation Organization (BIO). Prior to these roles, Dr. Wills spent over 25 years at Johnson & Johnson. Most recently he was Vice President, Alliance Management, Janssen Pharmaceutical Companies of Johnson & Johnson. He also served as Senior Vice President Global Development, where he was responsible for the R&D pipeline and a member of the R&D Board of Directors. In addition he served on several of the commercial Operating Company Boards and key pharmaceutical group decision-making committees. Dr. Wills began his career at Hoffmann-LaRoche where he spent 10 years in several roles of scientific responsibility. He holds a BS in Biochemistry and an MS in Pharmaceutics from the University of Wisconsin and a PhD in Pharmaceutics from the University of Texas.

Executive Officers of GTx Prior to the Merger

The following table sets forth information about GTx's executive officers as of March 31, 2019.

Name	Age	Position(s)
Executive Officers		
Marc S. Hanover	56	Chief Executive Officer
Robert J. Wills, Ph.D.	65	Executive Chairman
Henry P. Doggrell	70	Vice President, Chief Legal Officer and Secretary
Jason T. Shackelford	43	Vice President, Finance and Accounting, and Principal Financial and Accounting Officer

The biographies of Marc S. Hanover and Robert J. Wills, Ph.D. are provided above in the subsection "*Directors of GTx Prior to the Merger.*"

Henry P. Doggrell currently serves as GTx's Vice President, Chief Legal Officer and Secretary, after joining GTx in October 2001 as General Counsel and Secretary. From April 1998 to August 2001, Mr. Doggrell was Senior Vice President, Corporate Affairs at Buckeye Technologies, Inc., a specialty cellulose company,

where he was responsible for matters including corporate finance, investor relations, mergers and acquisitions, intellectual property and licensing and strategic development. From 1996 to 1998, Mr. Doggrell served as General Counsel and Secretary of Buckeye Technologies. Prior to joining Buckeye Technologies, Mr. Doggrell was a partner of the Baker, Donelson, Bearman, Caldwell and Berkowitz law firm from 1988 to 1996, where he served as a member of the law firm management committee and Chair of the firm's Corporate Securities department. Mr. Doggrell holds a B.S. in Commerce from the University of Virginia and a JD from Vanderbilt University.

Jason T. Shackelford currently serves as GTx's Vice President, Finance and Accounting, after joining GTx in July 2007 as Director, Accounting and Corporate Controller, and has served as our principal accounting officer since December 31, 2013 and as our principal financial and accounting officer since April 3, 2014. Prior to joining GTx, Mr. Shackelford was a Senior Audit Manager at KPMG LLP. Mr. Shackelford is a Certified Public Accountant and holds a Bachelor of Business Administration and Master of Accountancy from the University of Mississippi.

Executive Officers and Directors Following the Merger

Resignation of Current Executive Officers of GTx

Pursuant to the Merger Agreement, all of the current executive officers of GTx will resign immediately prior to the completion of the merger.

Executive Officers and Directors of the Combined Organization Following the Merger

The GTx Board is currently composed of seven directors. Following the merger, the GTx Board will be increased to nine directors. Pursuant to the Merger Agreement, all of the current directors of GTx, other than two designees selected by GTx to remain on the GTx Board, Drs. Carter and Wills, shall resign from the GTx Board at or prior to the Effective Time. Drs. Carter and Wills will then appoint, effective as of the Effective Time, (a) the two directors designated by SPH USA, (b) the one director who will serve as Chairman of the combined organization, (c) the one director who will serve as Chief Executive Officer of the combined organization and (d) the remaining three directors as designated in the Merger Agreement. It is anticipated that, following the closing of the merger, the GTx Board will be constituted as follows:

Name	Age	Current Principal Affiliation
David F. Hale	70	Oncternal Therapeutics, Inc., Chairman
James B. Breitmeyer, M.D., Ph.D.	65	Oncternal Therapeutics, Inc., President, Chief Executive Officer and Director
Michael G. Carter, M.D., Ch.B., F.R.C.P.	81	GTx, Inc., Director
Daniel L. Kisner, M.D.	71	Oncternal Therapeutics, Inc., Director Nominee
William R. LaRue	68	Oncternal Therapeutics, Inc., Director
Yanjun Liu, Ph.D.	54	Oncternal Therapeutics, Inc., Director
Xin Nakanishi, Ph.D.	56	Oncternal Therapeutics, Inc., Director
Charles P. Theuer, M.D., Ph.D.	55	Oncternal Therapeutics, Inc., Director
Robert J. Wills, Ph.D.	65	GTx, Inc., Executive Chairman

Following the merger, the management team of GTx is expected to be composed of the current management team of Oncternal. The following table lists the names, ages and positions of the individuals who are expected to serve as executive officers GTx upon completion of the merger:

Name	Age	Position(s)
James B. Breitmeyer, M.D. Ph.D.	65	President and Chief Executive Officer
Richard G. Vincent	56	Chief Financial Officer
Hazel M. Aker	63	General Counsel

Executive Officers

James B. Breitmeyer, M.D., Ph.D.
President, Chief Executive Officer, Director

Since September 2015, Dr. Breitmeyer has served as President, Chief Executive Officer and director of Oncternal Therapeutics, Inc. formally Tokalas, Inc. Dr. Breitmeyer is a veteran biotech executive with experience successfully starting and growing biotechnology organizations. He has been responsible for both the development and implementation of both operational and drug development strategies, as well as supervising and managing both large organizations and emerging biotechnology companies. Dr. Breitmeyer served as President of Bavarian Nordic, Inc. and Executive Vice President of Bavarian Nordic A/S, a multinational corporation headquartered in Denmark, from February 2013 to July 2015 where he oversaw business operations and development strategy both for Bavarian Nordic, Inc. and Bavarian Nordic A/S. He has been a director of Zogenix, Inc., a public pharmaceutical company, since March 2014, and was their acting Chief Medical Officer from August 2012 to February 2013 where he was responsible for clinical development and regulatory strategy. He previously served as the Executive Vice President of Development and Chief Medical Officer of Cadence Pharmaceuticals Inc., a public pharmaceutical company, from August 2006 to August 2012, and the Chief Medical Officer of Applied Molecular Evolution Inc., a wholly- owned subsidiary of Eli Lilly and Co., a global pharmaceutical company, from December 2001 to August 2006. Dr. Breitmeyer was also the founder, President and Chief Executive Officer of the Harvard Clinical Research Institute, and Chief Medical Officer and Head of Research & Development for North America at Serono Laboratories Inc., an international biopharmaceutical company. Dr. Breitmeyer served as a founding collaborator and scientific advisor to Immunogen Inc., a biotechnology company, and held clinical and teaching positions at the Dana Farber Cancer Institute and Harvard Medical School. Currently, Dr. Breitmeyer serves as a director on two public boards, Zogenix, Inc. (ZGNX) where he is also a member of the compensation committee and Otonomy, Inc. (OTIC) where he is a director and member of the compensation and audit committees. Dr. Breitmeyer earned his B.A. in Chemistry from the University of California, Santa Cruz and his M.D. and Ph.D. from Washington University School of Medicine and is Board Certified in Internal Medicine and Oncology. He holds an active California medical license.

The GTx Board and the Oncternal Board believe that Dr. Breitmeyer's perspective and experience as Oncternal's President and CEO, as well as his depth of operating and senior management experience in the pharmaceutical industry in both private and public organizations and educational background, provide him with the qualifications and abilities to serve as President and CEO of the combined company.

Richard G. Vincent
Chief Financial Officer

Mr. Vincent has served as Oncternal's Chief Financial Officer since April 2017. From 2012 to the present, Mr. Vincent has worked as an independent Chief Financial Officer, and was Chief Financial Officer and Secretary of Sorrento Therapeutics from January 2011 through February 2015. From 2008 to January 2011, Mr. Vincent served as an independent Chief Financial Officer to several pharmaceutical, biotech and medical device companies, including Avalyn Pharma (co-founder), Meritage Pharma, and Elevation Pharmaceuticals. Mr. Vincent served as Chief Financial Officer for Verus Pharmaceuticals from 2004 to 2008, and Women First Healthcare from 2003 to 2005. Mr. Vincent's areas of responsibility have spanned all areas of finance, treasury, investor and public relations, human resources, information technology, facilities and project management. From 1987 to 1995, Mr. Vincent held a number of positions with Deloitte & Touche LLP, the last of which was senior manager, where he specialized in emerging growth and publicly-reporting companies. Mr. Vincent became a Certified Public Accountant in California in 1989 and holds a B.S. degree in business with an emphasis in accounting from San Diego State University.

Hazel M. Aker
General Counsel

Hazel Aker has served as General Counsel to Oncternal since February 2019. Prior to Oncternal, Ms. Aker worked as an independent legal consultant from 2014 to the present, and was Senior Vice President, General Counsel and Secretary of Cadence Pharmaceuticals, Inc., from April 2007 through its acquisition by Mallinckrodt plc in March 2014. Previously, Ms. Aker served as General Counsel for several pharmaceutical, biotech and medical device companies. Ms. Aker is a member of the State Bar of California and holds a J.D. from the University of San Diego School of Law, and a B.A. from the University of California, San Diego.

Non-Employee Directors

David F. Hale
Chairman of the Board

David F. Hale is a co-founder and has served as a member of the Oncternal Board since 2013 and as chairman of the Oncternal Board since December 2018. Since May 2006, Mr. Hale has served as Chairman & CEO of Hale Biopharma Ventures, LLC. He is a serial entrepreneur who has been involved in the formation and development of numerous life sciences companies. He was previously President and CEO of CancerVax Corporation, a cancer therapeutic company from October 2000 through May 2006 when CancerVax merged with Micromet, Inc. He became Chairman of Micromet, Inc. until the sale of the company to Amgen Inc. in 2012. After joining Hybritech, Inc., in 1982, he was President & Chief Operating Officer and became CEO in 1986, when Hybritech was acquired by Eli Lilly and Co. From 1987 to 1997 he was Chairman, President and CEO of Gensia, Inc. He was a co-founder and Chairman of Viagene, Inc. from 1987 to 1995. He was President and CEO of Women First HealthCare, Inc. from January 1998 to June 2000. Prior to joining Hybritech in 1982, Mr. Hale was Vice President and General Manager of BBL Microbiology Systems, a division of Becton, Dickinson & Co. and from 1971 to 1980, held various marketing and sales management positions with Ortho Pharmaceutical Corporation, a division of Johnson & Johnson, Inc. Mr. Hale also serves as Chairman of Biocept, Inc and Conatus Pharmaceuticals Inc. Mr. Hale previously served as Chairman of Santarus, Inc., Somaxon, Inc., SkinMedica, Inc., CRISIMed, Inc. and Agility Clinical, Inc. He also serves as Chairman of a number of privately held companies, including MDR Aesthetics Inc., Recros Medica, Inc., Clarify Medical, Inc., Neurana Pharmaceuticals, Inc. and Adigica Health, Inc., and as a Director of Neurelis, Inc. Mr. Hale also is a co-founder and serves on the Board of Directors of BIOCOM, is a former member of the board of Biotechnology Industry Organization, or BIO, and the Biotechnology Institute. Mr. Hale also serves as a member of the board of directors of the San Diego Economic Development Corporation, as a board trustee of Rady Children's Hospital of San Diego, Chairman of the board of Rady Children's Institute of Pediatric Genomics and a trustee of the Salk Institute. He is a co-founder of the CONNECT Program in Technology and Entrepreneurship. Mr. Hale holds a B.A. in Biology and Chemistry from Jacksonville State University.

The GTx Board and the Oncternal Board believe Mr. Hale is qualified to serve as chairman of the combined company's board of directors because of his extensive knowledge of Oncternal's business and history, experience as a board member of multiple publicly-traded and privately-held companies, and expertise in developing, financing and providing strong executive leadership to numerous biopharmaceutical companies.

Michael G. Carter, M.D., Ch.B., F.R.C.P

The biography of Michael G. Carter is provided above in the subsection "*Directors of GTx Prior to the Merger*."

Daniel L. Kisner, M.D.

Daniel L. Kisner, M.D. currently serves as an independent consultant in the life science industry. He was a partner at Aberdare Ventures from 2003 to 2011. Dr. Kisner served as Chairman of the Board of Directors of Caliper Life Sciences from 2002 to 2008, and as President and CEO of its predecessor company, Caliper

Technologies, from 1999 to 2002. He held positions of increasing responsibility at Isis Pharmaceuticals, Inc., from 1991 to 1999, most recently as President and COO. Dr. Kisner previously served in pharmaceutical research and development executive positions at Abbott Laboratories from 1988 to 1991 and at SmithKline Beckman Laboratories from 1985 to 1988. He held a tenured faculty position in the Division of Medical Oncology at the University of Texas, San Antonio School of Medicine until 1985 after a five-year advancement through the Cancer Treatment Evaluation Program of the National Cancer Institute. Dr. Kisner is board certified in internal medicine and medical oncology. Dr. Kisner holds a B.A. from Rutgers University and an M.D. from Georgetown University. Dr. Kisner currently serves as a director at Conatus Pharmaceuticals Inc., Zynerba Pharmaceuticals and Dynavax Technologies Corporation, and has extensive prior private and public company board experience, including serving as Chairman of the Board of Directors at Tekmira Pharmaceuticals. Dr. Kisner's extensive leadership experience in the biotechnology and biopharmaceutical industries and as a venture capital investor contributed to the board of directors' conclusion that he should serve as a director of the combined company.

William R. LaRue

William R. LaRue has served as a member of the Oncternal Board since December 2017. Mr. LaRue currently serves as an independent board member for multiple public and private companies in the life science industry. He served as Senior Vice President and Chief Financial Officer at Cadence Pharmaceuticals, Inc., a biopharmaceutical company, starting in June 2006, and expanded his role to serve as Assistant Secretary at Cadence in April 2007, serving in both capacities until the company's acquisition by Mallinckrodt plc in March 2014. At Cadence, Mr. LaRue was a member of the Executive Committee with direct responsibility for the company's financial leadership including corporate financing, investor relations, financial planning and reporting, SEC reporting, accounting, treasury, risk management, tax and information technology. During his tenure, Cadence raised over $375 million in public and private equity and senior debt, including an IPO in October 2006 as the company transitioned from a development stage to a commercial stage company. Prior to joining Cadence, Mr. LaRue served as the Senior Vice President and Chief Financial Officer of CancerVax Corporation, a biotechnology company, from 2001 until its merger with Micromet, Inc. in May 2006. Mr. LaRue currently serves as a member of the board of directors and chair of the Audit Committee of Tracon Pharmaceuticals, Inc., Conatus Pharmaceuticals, Inc. and Alastin Skincare, Inc. He previously served on the boards of directors of Applied Proteomics, Inc., Neurelis, Inc. and Cadence Pharmaceuticals, Inc. Mr. LaRue received a B.S. in business administration and an M.B.A. from the University of Southern California. Mr. LaRue's extensive financial experience and leadership in both private and public companies contributed to the board of directors' conclusion that he should serve as a director of the combined company.

Yanjun Liu, M.D., Ph.D.

Yanjun Liu, M.D., Ph.D., has served as a member of the Oncternal Board since November, 2018. He has been Vice President of SPH and holds the position of President of the Central Research Institute, a division of SPH, since 2013. Dr. Liu serves as Chairman of the Board of Shanghai Jiaolian Medicine Research and Development Co., Ltd, a wholly-owned subsidiary of SPH. From 2001 to 2012, Dr. Liu served as a Vice General Manager in Shanghai Fudan-Zhangjiang Bio-Pharmaceutical Co. Dr. Liu holds a M.D. and a Ph.D. from Second Military Medical University in Shanghai, China. Dr. Liu's extensive experience as a chairman, director, and senior management of international healthcare companies contributed to the board of directors' conclusion that he should serve as a director of the combined company.

Xin Nakanishi, Ph.D.

Xin Nakanishi, Ph.D. has served as a member of the Oncternal Board since November 2018. She has served as the Chief Executive Officer of Shanghai Pharma Biotherapeutics USA Inc., a subsidiary of SPH USA, since July 2018. Dr. Nakanishi previously served as a venture partner at Yuansheng bioVENTURE from 2017-2018, and was CEO and founder of Sunvita Therapeutics, LLC from 2009- 2018 a company that provided cross border business development for various U.S. and Chinese biopharmaceutical companies. She was also the Director of

Biology at Phenomix Inc., a senior scientist at Pfizer, and a group leader at Immusol Inc. Dr. Nakanishi holds a B.A. in Virology from Wuhan University and a Ph.D. in Biochemistry from the University of Kansas. Dr. Nakanishi's extensive experience in the life science and pharmaceutical industries contributed to the board of directors' conclusion that she should serve as a director of the combined company.

Charles P. Theuer, M.D., Ph.D.

Since March of 2018, Dr. Theuer has served as a member of the Oncternal Board. He has been President, Chief Executive Officer and a member of the board of TRACON Pharmaceuticals, Inc. since July 2006. From 2004 to 2006, Dr. Theuer was the Chief Medical Officer at TargeGen, Inc., a biotechnology company. Prior to joining TargeGen, Inc., Dr. Theuer was Director of Clinical Oncology at Pfizer, Inc., a pharmaceutical corporation, from 2003 to 2004. Dr. Theuer has also held senior positions at IDEC Pharmaceuticals Corp. from 2002 to 2003 and at the National Cancer Institute from 1991 to 1993. In addition, he has held academic positions at the University of California, Irvine, where he was Assistant Professor in the Division of Surgical Oncology and Department of Medicine. Dr. Theuer currently serves as a director at 4D Molecular Therapeutics, a position he has held since January 2016. Dr. Theuer received a B.S. from the Massachusetts Institute of Technology, an M.D. from the University of California, San Francisco, and a Ph.D. from the University of California, Irvine. He completed a general surgery residency program at Harbor-UCLA Medical Center and was board certified in general surgery in 1997. Dr. Theuer's extensive clinical development experience and service as a director or officer of healthcare companies contributed to the board of directors' conclusion that he should serve as a director of the combined company.

Robert J. Wills, Ph.D.

The biography of Robert J. Wills is provided above in the subsection "*Directors of GTx Prior to the Merger*."

Composition of the Board of Directors Prior to and Following the Merger

The GTx Board is currently comprised of seven directors divided into three staggered classes, each class serving three-year terms. The staggered structure of the GTx Board will remain in place following completion of the merger. At the most recent annual meeting of GTx's stockholders held in 2018, Class II directors were elected. As a result, the term of the Class II directors of the combined organization will expire upon the election and qualification of successor directors at the annual meeting of stockholders in 2021, with the terms of the Class III directors and Class I directors expiring upon the election and qualification of successor directors at the annual meetings of stockholders to be held in 2019 and 2020, respectively.

The director classes for GTx are currently as follows:

- Class I directors: Marc S. Hanover, Gary A. Neil and Kenneth S. Robinson;
- Class II directors: J. Kenneth Glass and Robert J. Wills; and
- Class III directors: Michael G. Carter and J.R. Hyde, III.

Pursuant to the Merger Agreement, each of the directors and officers of GTx who will not continue as directors or officers of GTx or the surviving corporation following the consummation of the merger shall resign immediately prior to the Effective Time. In connection with the merger, the GTx Board will be expanded to include a total of nine directors. Pursuant to the Merger Agreement, two such directors shall be designated by GTx, two such directors shall be designated by SPH USA, one director shall be the Chairman of the combined organization, one director shall be the Chief Executive Officer of the combined organization and the remaining three directors shall be as designated in the Merger Agreement. Effective as of the Effective Time, it is anticipated that Drs. Carter and Wills will remain on the GTx Board and that the board of directors will increase the size of the board to nine. Then, Dr. Carter and Dr. Wills will elect Mr. Hale, Dr. Breitmeyer, Dr. Kisner, Mr. LaRue, Dr. Liu, Dr. Nakanishi and Dr. Theuer, to the GTx Board. It is anticipated that these directors will be appointed to the three staggered director classes of the combined organization's board of directors as follows:

- Class I directors (expiring in 2020): Daniel L. Kisner, Xin Nakanishi and Charles P. Theuer;

- Class II directors (expiring in 2021): William R. LaRue, Yanjun Liu and Robert J. Willis; and
- Class III directors (expiring in 2022): James B. Breitmer, Michael G. Carter and David F. Hale.

The division of the GTx Board into three classes with staggered three-year terms may delay or prevent a change of management or a change of control of GTx, or, following the completion of the merger, the combined organization.

GTx's Nominating and Governance Committee is responsible for reviewing the board of directors, on an annual basis. In evaluating the suitability of individual candidates (both new candidates and current members), the Nominating and Corporate Governance Committee and the board of directors of the combined organization may take into account many factors, including the following:

- diversity of personal and professional background, perspective, experience, age, gender, ethnicity and country of citizenship;
- personal and professional integrity and ethical values;
- experience in one or more fields of business, professional, governmental, scientific or educational endeavors, and a general appreciation of major issues facing public companies similar in scope and size to GTx;
- experience relevant to GTx's industry or social policy concerns;
- relevant academic expertise or other proficiency in an area of GTx's operations;
- objective and mature business judgment and expertise; and
- any other relevant qualifications, attributes or skills.

There are no family relationships among any of GTx's current directors and executive officers, and there are no family relationships among any of the combined organization's proposed directors and executive officers.

Director Independence

As required under the Nasdaq listing standards, a majority of the members of a listed company's board of directors must qualify as "independent," as affirmatively determined by the board of directors. The GTx Board has determined that after the completion of the merger, seven of the combined company's nine directors are expected to be independent members of the combined company's board of directors within the meaning of the applicable Nasdaq listing standards: Mr. Hale, Dr. Carter, Dr. Kisner, Mr. LaRue, Dr. Liu, Dr. Nakanishi and Dr. Theuer. Dr. Wills is not expected to be "independent" within the meaning of the Nasdaq listing standards because he will have served as executive chairman of GTx immediately prior to the Effective Time. Dr. Breitmeyer is not expected to be "independent" within the meaning of the Nasdaq listing standards because he will have served as an executive officer of Oncternal immediately prior to the Effective Time and is expected to serve as Chief Executive Officer of the combined organization.

Committees of the Board of Directors Prior to and Following the Merger

The GTx Board currently has four standing committees: the Audit Committee, the Compensation Committee, the Nominating and Corporate Governance Committee and the Scientific and Development Committee. The charters for the Audit Committee, the Compensation Committee, the Nominating and Corporate Governance Committee and the Scientific and Development Committee are available on GTx's website (www.gtxinc.com) under "Investors" at "Corporate Governance." The current membership and anticipated membership after the merger of each of the Audit Committee, Compensation Committee and Nominating and Corporate Governance Committee are shown below. Information about the duties and responsibilities of each of the Audit Committee, the Compensation Committee and the Nominating and Corporate Governance Committee are provided below. After the merger, each of these committees are expected to retain these duties and responsibilities. The purpose of the Scientific and Development Committee is to assist the GTx Board by reviewing and evaluating GTx's research strategy, as well as its research, development and clinical programs.

After the merger, the Compensation Committee and the Nominating and Corporate Governance Committee of the combined company's board of directors are expected to be comprised entirely of directors who are independent within the meaning of the Nasdaq listing standards, and the members of the Audit Committee are expected to be independent under applicable Nasdaq listing standards and SEC rules. In addition, the GTx Board has determined that William R. LaRue, qualifies as an "audit committee financial expert" within the meaning of the SEC rules.

Audit Committee

Number of Meetings held in 2018: Four

Current Members	Anticipated Members After Merger	Current and Anticipated Committee Functions
J. Kenneth Glass (Chair)	William R. LaRue (Chair)	• Oversees financial and operational matters involving accounting, corporate finance, auditing, internal control over financial reporting, compliance, and business ethics. • Oversees other financial audit and compliance functions as assigned by the board of directors. • Oversees those functions which may pose material financial risk to GTx. • Has the sole authority to select, evaluate, replace and oversee GTx's independent registered public accounting firm. • Has the sole authority to approve non-audit and audit services to be performed by the independent registered public accounting firm. • Monitors the independence and performance of the independent registered public accounting firm. • Provides an avenue of communications among the independent registered public accounting firm, management and the board of directors. • Reviews, approves and provides oversight of "related party transactions." • Has the specific responsibilities and authority necessary to comply with the Nasdaq listing standards applicable to audit committees.
Michael G. Carter	David F. Hale	• Reviews, approves and provides oversight of "related party transactions." • Has the specific responsibilities and authority necessary to comply with the Nasdaq listing standards applicable to audit committees.
Kenneth S. Robinson	Daniel L. Kisner	

Compensation Committee

Number of Meetings held in 2018: One

Current Members	Anticipated Members After Merger	Committee Functions
Michael G. Carter (Chair) J. Kenneth Glass J.R. Hyde, III	David F. Hale (Chair) William R. LaRue Daniel L. Kisner	• Reviews the performance of GTx officers and establishes overall executive compensation policies and programs. • Reviews and approves compensation elements such as base salary, bonus awards, stock option grants and other forms of long-term incentives for GTx officers. • Has the authority, in its sole discretion, to retain (or obtain the advice of) any compensation consultant, legal counsel or other adviser to assist it in the performance of its duties. • Evaluates the independence of GTx's compensation advisers. • Has the direct responsibility for the appointment, compensation and oversight of the work of any advisers retained or engaged by the Compensation Committee. • Reviews board of directors compensation. • Has the specific responsibilities and authority necessary to comply with the Nasdaq listing standards applicable to compensation committees.

Nominating and Corporate Governance Committee

Number of Meetings held in 2018: One

Current Members	Anticipated Members After Merger	Committee Functions
Kenneth S. Robinson (Chair) J.R. Hyde, III Gary A. Neil	Michael G. Carter (Chair) David F. Hale Charles P. Theuer	• Evaluates governance standards for GTx to ensure that appropriate governance policies and procedures have been established and are being followed. • Develops criteria to determine the qualifications and appropriate tenure of directors. • Reviews such qualifications and makes recommendations to the Board regarding the nomination of current directors for re-election to the Board as well as new nominees to fill vacancies on the Board.

Current Members	Anticipated Members After Merger	Committee Functions
		• Considers any stockholder recommendations for Board nominees, as described below. • Recommends to the Board the chairmanship and membership of each Board committee. • Reviews succession plans for GTx officers.

Compensation Committee Membership, Interlocks and Insider Participation

Following completion of the merger, GTx's Compensation Committee is expected to consist of Messrs. Hale, LaRue and Kisner. Mr. Hale is expected be the Chair of the Compensation Committee. Each member of the Compensation Committee is expected to be a "non-employee" director within the meaning of Rule 16b-3 of the rules promulgated under the Exchange Act, and independent within the meaning of the independent director guidelines of Nasdaq and the SEC. None of the proposed executive officers of the combined organization serves as a member of the board of directors or compensation committee of any entity that has one or more executive officers who is proposed to serve on the combined organization's board of directors or Compensation Committee following the merger.

Nominating and Corporate Governance Committee Matters

The Nominating and Corporate Governance Committee expects, as minimum qualifications, that nominees to the GTx Board (including incumbent directors) will enhance the board's management, finance, commercial and/or scientific expertise, will not have a conflict of interest and will have a high ethical standard and, with respect to new members of the board of directors, a willingness to serve at least an initial three year term for the Nominating and Corporate Governance Committee to recommend them to the board of directors. A director nominee's knowledge and/or experience in areas such as, but not limited to, the medical, pharmaceutical, biotechnology, biopharmaceutical or life sciences industry, equity and debt capital markets and financial accounting are likely to be considered both in relation to the individual's qualification to serve on our board of directors and the needs of the board of directors as a whole. While we do not have a formal policy on board diversity, the Nominating and Corporate Governance Committee takes into account a broad range of diversity considerations when assessing director candidates, including individual backgrounds and skill sets, professional experiences and other factors that contribute to the board having an appropriate range of expertise, talents, experiences and viewpoints, and considers those diversity considerations, in view of the needs of the board as a whole, when making decisions on director nominations. Other characteristics, including but not limited to, the director nominee's material relationships with GTx, time availability, service on other boards of directors and their committees, or any other characteristics which may prove relevant at any given time as determined by the Nominating and Corporate Governance Committee are reviewed for purposes of determining a director nominee's qualification.

Candidates for director nominees are evaluated by the Nominating and Corporate Governance Committee in the context of the current composition of the board of directors, the operating requirements of GTx and the long-term interests of GTx's stockholders. In the case of new director candidates, the Nominating and Corporate Governance Committee also determines whether the nominee must be independent for Nasdaq purposes, which determination is based upon applicable Nasdaq listing standards, applicable SEC rules and regulations and the advice of counsel, if necessary. The Nominating and Corporate Governance Committee then may use its network of contacts to compile a list of potential candidates, but may also engage, if it deems appropriate, a professional search firm. The Nominating and Corporate Governance Committee conducts any appropriate and necessary

inquiries into the backgrounds and qualifications of possible candidates after considering the function and needs of the board of directors. In the case of incumbent directors whose terms of office are set to expire, the Nominating and Corporate Governance Committee reviews such directors' overall service to GTx during their term, including the number of meetings attended, level of participation, quality of performance, and any other relationships and transactions that might impair such directors' independence. The Nominating and Corporate Governance Committee meets to discuss and consider such candidates' qualifications and then selects a nominee for recommendation to the Board by majority vote. The Nominating and Corporate Governance Committee does not intend to alter the manner in which it evaluates candidates, including the minimum criteria set forth above, based on whether the candidate was recommended by a stockholder or not. To date, the Nominating and Corporate Governance Committee has not paid a fee to any third-party to assist in the process of identifying or evaluating director candidates.

The board of directors does not impose term limits or a mandatory retirement age for directors, except that our Chief Executive Officer (or any other officer of GTx, including the Executive Chairman, if he or she is a member of the board) is required to tender his or her resignation to the board if he or she ceases to serve as an executive officer of GTx. The Nominating and Corporate Governance Committee will then consider all of the relevant facts and circumstances and recommend to the board of directors the action to be taken with respect to such offer of resignation. With respect to non-employee members of the board of directors, while it is believed that a director's knowledge and/or experience can continue to provide benefit to the board of directors following a director's retirement from his or her primary work affiliation, it is recognized that a director's knowledge of and involvement in ever changing business environments can weaken, and therefore his or her ability to continue to be an active contributor to the board of directors will be reviewed. Upon a director's change in his or her employment status, if any, he or she is required to notify the Nominating and Corporate Governance Committee of such change and, if determined by the board of directors upon recommendation of the Nominating and Corporate Governance Committee, to offer his or her resignation.

Compensation Committee Matters

Scope of Authority. The GTx Compensation Committee acts on behalf of the GTx Board to establish the compensation of executive officers of GTx and provides oversight of GTx's compensation philosophy. The GTx Compensation Committee also acts as the oversight committee with respect to GTx's benefit plans, stock plans and bonus plans covering executive officers and other senior management. In overseeing those plans, the GTx Compensation Committee has the sole authority for the day-to-day administration and interpretation of the plans. The GTx Compensation Committee retains the authority for establishing all matters with respect to the compensation of the GTx executive officers, although the GTx Compensation Committee may recommend to the full GTx Board that it take action with respect to such compensation matters. Under its charter, the GTx Compensation Committee has the authority, in its sole discretion, to retain (or obtain the advice of) any compensation consultant, legal counsel or other adviser to assist it in the performance of its duties. The GTx Compensation Committee also has the direct responsibility for the appointment, compensation and oversight of the work of any advisers retained or engaged by the GTx Compensation Committee. Finally, the GTx Compensation Committee has the sole authority to approve the reasonable fees and the other terms and conditions of the engagement of any such advisor, including authority to terminate the engagement. GTx must provide for appropriate funding, as determined by the GTx Compensation Committee, for the payment of reasonable compensation to any such adviser retained by the GTx Compensation Committee.

Dr. Carter, as Chair of the GTx Compensation Committee, is responsible for setting the agenda for meetings. The GTx Compensation Committee annually evaluates the performance, and determines the compensation, of the Executive Chairman of the Board, Chief Executive Officer and the other officers of GTx.

Role of Compensation Consultants in 2018 Compensation Determinations. Under its charter, the GTx Compensation Committee has the authority to retain its own compensation consultant at company expense. For the fiscal year ended December 31, 2018, the GTx Compensation Committee decided, at a special meeting of the

committee held on December 6, 2017, to await the results from the Phase 2 clinical trial evaluating enobosarm as a potential treatment for stress urinary incontinence (the "ASTRID trial") before determining whether a compensation consultant should be retained to review and assess the adequacy of the peer group the GTx Compensation Committee was then using for evaluating executive and Board compensation, since the GTx Compensation Committee recognized that the composition and structure of the company could change significantly depending on the outcome of the trial. Following the results from the ASTRID trial in the fall of 2018, no compensation consultant was retained to review and assess the company's peer group and current executive compensation; rather the GTx Compensation Committee focused on a plan to reduce company personnel over time while retaining sufficient employees to continue to function as a public company and assess strategic alternatives for the company to best maximize stockholder value.

Roles of Executives in Establishing Executive Compensation. Historically, GTx's human resource, finance and legal departments worked with senior management to design and develop compensation programs for the named executive officers for recommendation to the GTx Compensation Committee. In addition, these management groups worked together to recommend changes to existing compensation programs, to recommend financial and other performance targets to be achieved under those programs, to prepare analyses of financial data, and to prepare peer data comparisons and other briefing materials for the GTx Compensation Committee. GTx's Chief Executive Officer, Mr. Hanover, leads the human resource, finance and legal departments in designing and developing compensation programs for the GTx executive officers, and presents these proposals to the GTx Compensation Committee. Mr. Hanover discusses all executive compensation proposals with the Executive Chairman of the Board, Dr. Wills, and Henry P. Doggrell, GTx's Chief Legal Officer, before they are presented to the GTx Compensation Committee for its consideration. The GTx Compensation Committee may approve, modify, or reject those proposals, or may request additional information from management (or its own consultant, if it wished to retain one) on those matters.

Dr. Wills and Mr. Hanover also make recommendations to the GTx Compensation Committee with respect to the specific performance goals to be achieved under the GTx Executive Bonus Compensation Plan, which is described in more detail below in the section entitled, "*Executive Compensation —Narrative Disclosure to Summary Compensation Table—Annual Bonus Plan.*" Dr. Wills and Mr. Hanover provide annual reviews of the performance of each of the executive officers (other than themselves) to assist the GTx Compensation Committee in its annual determination of each element of compensation for such officers. The performance of Dr. Wills and Mr. Hanover is evaluated by the GTx Compensation Committee.

Typically, the GTx Compensation Committee meets in executive session to discuss and determine appropriate base salaries, bonus compensation target awards and goals (if applicable), and equity awards for each executive officer of GTx.

No executive officer was present or directly participated in the final deliberations of the GTx Compensation Committee with respect to any component of his or her own compensation.

Director Compensation. The GTx Board sets non-employee directors' compensation at the recommendations of both the Nominating and Corporate Governance Committee and the GTx Compensation Committee. The GTx Compensation Committee and the GTx Board believe that: director compensation should fairly compensate directors for work required in a company of GTx's size and scope; the compensation should align directors' interests with the long-term interest of stockholders; and the structure of the compensation should be simple, transparent and easy for stockholders to understand. GTx's non-employee director compensation program has typically consisted of a combination of a cash retainer and initial and annual stock option grants, with the number of shares subject to the annual stock option grant based on providing eligible directors aggregate equity grants in line with the 50th percentile of the equity granted to non-employee directors of GTx's peers. Data from GTx's peers is gathered from Equilar's online data base reflecting compensation information gleaned from the prior year's proxy statement for each peer, and then considered by the Nominating and Corporate Governance Committee and the GTx Compensation Committee for the purpose of making recommendations to the Board for

director compensation which the Board must then approve. During the November 2017 meetings of the GTx Nominating and Corporate Governance and the GTx Compensation Committee, relevant data from Equilar on peer group director compensation was reviewed and used to assess current non-employee director compensation. It was determined by the GTx Nominating and Corporate Governance and the GTx Compensation Committee that the cash compensation paid to non-employee directors for their service to GTx was consistent with similar payments by the company's peers, and no adjustments in cash compensation payments were needed. However, the data suggested that equity compensation was below the aggregate equity grants received by peer group board members, and the members of the GTx Nominating and Corporate Governance and the GTx Compensation Committee discussed various ways annual equity grants could be determined for 2018, including using a Black-Scholes calculation, based on an agreed stock value grant, when the annual grants were to be made to eligible directors on the date following the annual meeting of stockholders. At the March 2018 meetings of the GTx Nominating and Corporate Governance and the GTx Compensation Committee and the GTx Board, it was determined that the escalating price of GTx common stock made a predetermined future grant of a specific value less likely to achieve the desired outcome of having the annual stock option grants consistent with the equity grants in line with the 50th percentile of the equity granted to non-employee directors of GTx's peers, and the GTx Nominating and Corporate Governance and the GTx Compensation Committee decided to recommend to the Board that an award of stock options to acquire 7,500 shares of GTx common stock was more in line with its peers and consistent with what the Board has granted its eligible directors historically. Accordingly, the number of shares subject to the automatic annual stock option grants occurring on the date following the 2018 annual meeting of stockholders was 7,500 shares of GTx common stock. GTx's current director compensation program will be suspended at the time of the closing of the merger and the director compensation policies for the combined organization following the merger will be re-evaluated by the compensation committee and board of directors of the combined organization following completion of the merger and may be subject to change. Non-employee directors of the combined organization are, however, expected to receive annual cash retainers and equity compensation, although the amount of such compensation has not yet been determined. Consistent with our governance practice, the Nominating and Corporate Governance Committee made this recommendation to the GTx Compensation Committee, which concurred and provided the joint recommendation to the Board for its approval. For more information on the compensation arrangements for our non-employee directors, please see the section titled "*Director Compensation*" below.

Compensation Committee Charter. The GTx Compensation Committee reviews its charter on an annual basis and, if necessary, recommends changes to the GTx Board for its approval. A copy of the GTx Compensation Committee's charter can be found on GTx's corporate website at *www.gtxinc.com* under "Investors" at "Corporate Governance."

GTx Equity Compensation Plan Information

The following table provides certain information with respect to all of GTx's equity compensation plans in effect as of December 31, 2018. The number of shares of common stock of GTx set forth below do not reflect the GTx Reverse Stock Split.

Name	Number of Securities to be Issued upon Exercise of Outstanding Options, Warrants and Rights (a)	Weighted-Average Exercise Price of Outstanding Options, Warrants and Rights (b)	Number of Securities Remaining Available for Future Issuance Under Equity Compensation Plans (Excluding Securities Reflected in Column (a)) (c)
Plan Category			
Equity compensation plans approved by security holders	2,335,447 (1)	$ 11.67	1,167,162 (2)
Equity compensation plans not approved by security holders	122,725 (3)	— (3)	37,526(4)
Total	2,458,172	$ 11.67	1,204,688

(1) Represents shares of GTx common stock underlying stock options granted under, as applicable: (i) the GTx, Inc. 2001 Stock Option Plan (the "2001 Plan"), the GTx, Inc. 2002 Stock Option Plan (the "2002 Plan"),

and the GTx, Inc. 2004 Equity Incentive Plan, (the "2004 Plan"); (ii) the GTx, Inc. Amended and Restated 2004 Non-Employee Directors' Stock Option Plan (the "Prior Directors' Plan"); (iii) the GTx, Inc. 2013 Equity Incentive Plan (the "2013 Plan"); and (iv) the GTx, Inc. 2013 Non-Employee Director Equity Incentive Plan (the "2013 Directors' Plan"). From and after the May 2, 2013 effective date of the 2013 Plan and 2013 Directors' Plan, no further awards may be made under the 2001 Plan, 2002 Plan, 2004 Plan and the Prior Directors' Plan. Stock options previously granted under the 2001 Plan, 2002 Plan, 2004 Plan and the Prior Directors' Plan continue to be governed by the terms of the applicable plan.

(2) Represents shares of GTx common stock remaining available for future issuance under the 2013 Plan and the 2013 Directors' Plan. The total number of shares of GTx common stock available for future issuance under the 2013 Plan, upon its May 2, 2013 effective date, was initially 420,815 shares plus up to an additional 609,355 Returning Employee Shares (as defined below) as such shares become available from time to time as set forth in the 2013 Plan. "Returning Employee Shares" means the shares subject to outstanding awards granted under the Genotherapeutics, Inc. Stock Option Plan, the GTx, Inc. 2000 Stock Option Plan, the 2001 Plan, the 2002 Plan and the 2004 Plan that, from and after the May 2, 2013 effective date of the 2013 Plan, expire or terminate for any reason prior to exercise or settlement, are forfeited because of the failure to vest in those shares or are otherwise returned to the 2013 Plan share reserve pursuant to the terms of the 2013 Plan. As of December 31, 2018, an aggregate of 1,001,047 shares of GTx common stock remained available for future issuance under the 2013 Plan, plus up to an additional 203,797 Returning Employee Shares as such shares become available from time to time thereafter as set forth in the 2013 Plan. In addition, the number of shares remaining available for future issuance under the 2013 Plan automatically increases on January 1st of each year, for ten years, commencing on January 1, 2014, in an amount equal to 4% of the total number of shares of GTx common stock outstanding on December 31 of the preceding calendar year, or such lesser (or no) amount as may be approved by the GTx Board. On January 1, 2019, the number of shares available for issuance under the 2013 Plan automatically increased by 962,074 shares. The total number of shares of GTx common stock available for future issuance under the 2013 Directors' Plan, upon its May 2, 2013 effective date, was initially 40,400 shares plus up to an additional 44,966 Returning Director Shares (as defined below) as such shares become available from time to time as set forth in the 2013 Directors' Plan. "Returning Director Shares" means the shares subject to outstanding awards granted under the Prior Directors' Plan that, from and after the May 2, 2013 effective date of the 2013 Directors' Plan, expire or terminate for any reason prior to exercise or settlement, are forfeited because of the failure to vest in those shares or are otherwise returned to the 2013 Directors' Plan share reserve pursuant to the terms of the 2013 Directors' Plan. As of December 31, 2018, an aggregate of 166,115 shares of GTx common stock remained available for future issuance under the 2013 Directors' Plan, plus up to an additional 15,000 Returning Director Shares as such shares become available from time to time thereafter as set forth in the 2013 Directors' Plan. In addition, the number of shares remaining available for future issuance under the 2013 Directors' Plan automatically increases on January 1st of each year, for ten years, commencing on January 1, 2014, in an amount equal to the lesser of 1% of the total number of shares of GTx common stock outstanding on December 31 of the preceding calendar year and 50,000 shares, or such lesser (or no) amount as may be approved by Board of Directors. On January 1, 2019, the number of shares available for issuance under the 2013 Directors' Plan automatically increased by 50,000 shares.

(3) Represents shares credited to individual director stock accounts as of December 31, 2018 under the GTx Directors' Deferred Compensation Plan. There is no exercise price for these shares.

(4) As of December 31, 2018, GTx had reserved an aggregate of 175,000 shares of GTx common stock for issuance pursuant to our Directors' Deferred Compensation Plan. The number of shares that may become issuable under the GTx Directors' Deferred Compensation Plan depends solely on future elections made by plan participants. As of December 31, 2018, 14,749 shares of common stock had been distributed to participants in the GTx Directors' Deferred Compensation Plan, and 122,725 shares were then credited to individual director stock accounts under the GTx Directors' Deferred Compensation Plan.

GTX EXECUTIVE COMPENSATION

Summary Compensation Table

The following table sets forth certain summary information for the years indicated with respect to the compensation earned by GTx's Chief Executive Officer and the two most highly compensated executive officers of GTx other than the Chief Executive Officer who were serving as executive officers as of December 31, 2018. These individuals are referred to in this proxy statement as GTx's "named executive officers."

SUMMARY COMPENSATION TABLE

Name and Principal Position	Year	Salary ($)(1)	Bonus ($)(2)	Option Awards ($)(3)	Non-Equity Incentive Plan Compensation ($)(4)	All Other Compensation ($)(5)	Total ($)
Marc S. Hanover	2018	445,628	—	659,984	115,863	22,338	1,243,813
Chief Executive Officer	2017	432,649	28,122	346,988	154,672	21,586	984,017
Robert J. Wills	2018	226,600	—	659,984	58,916	36,046	981,546
Executive Chairman	2017	220,000	14,300	346,988	78,650	31,268	691,206
Henry P. Doggrell	2018	389,463	—	456,912	54,525	24,836	925,736
Vice President, Chief Legal Officer and Secretary	2017	378,119	13,234	292,200	72,788	21,996	778,337

(1) The amounts in this column represent base salary earned during the indicated fiscal year.

(2) The amounts in this column represent amounts awarded as a discretionary bonus paid under the GTx Executive Bonus Compensation Plan (the "Bonus Plan"). As discussed under "*—Narrative Disclosure to Summary Compensation Table—Annual Bonus Plan*" below, each named executive officer was eligible for a discretionary bonus award of up to 10% of his target bonus under the Bonus Plan based on the GTx Compensation Committee's assessment of the named executive officer's personal performance during 2017 and 2018. No discretionary bonuses were awarded for 2018 performance.

(3) The amounts in the column represent the aggregate grant date fair value of all option awards granted during 2017 and 2018 as determined in accordance with FASB ASC Topic 718. Assumptions used in computing the grant date fair values of the stock options in accordance with FASB ASC Topic 718 are set forth in Note 3—Share-Based Compensation to the GTx financial statements included elsewhere in this proxy statement/prospectus/information statement. For more information on these stock options granted in 2017 and 2018, see "*—Narrative Disclosure to Summary Compensation Table—Option Awards*" below.

(4) Represents the amounts earned by the named executive officers under the Bonus Plan based on the attainment of pre-established, objective performance goals approved by the GTx Compensation Committee. For more information on the GTx Bonus Plan, please see "*—Narrative Disclosure to Summary Compensation Table—Annual Bonus Plan*" below.

(5) The amounts in this column consisted of (a) employer matching contributions to the GTx defined contribution 401(k) Plan, (b) with respect to Mr. Hanover and Mr. Doggrell only, the incremental cost of life insurance premiums to provide additional term life insurance benefits equal to up to two times each such named executive officer's base salary along with supplemental long-term disability insurance premiums, and (c) with respect to Dr. Wills only, the following items of compensation:

Year	Commuting Expenses Paid ($)	Tax Gross-Up Payment ($)
2018	17,350	9,038
2017	11,820	8,648

Narrative Disclosure to Summary Compensation Table

Base Salary

The GTx Compensation Committee recognizes the importance of base salary as an element of compensation that helps to attract and retain the executive officers. GTx provides base salary as a fixed source of income for its executives for the services they provide to GTx during the year, and allow GTx to maintain a stable executive team.

In determining base salaries for 2018, the GTX Compensation Committee took into account that there had been no salary increases since 2016 other than in connection with certain employee promotions. After considering GTx's capital position and the achievement of certain operational milestones during 2017, in November 2017, the GTx Compensation Committee determined that the base salaries of the GTx executive officers and other employees should be increased approximately 3% from their existing base salaries, effective January 1, 2018. The GTx Compensation Committee also approved the performance criteria for 2018 under the Bonus Plan that were tied to the attainment of certain milestones, as described in detail below. Additionally, the base salaries of the GTx executive officers were increased, effective January 1, 2018, to the following:

Named Executive Officer	2018 Annual Base Salary ($)
Marc S. Hanover	445,628
Robert J. Wills, Ph.D.	226,600(1)
Henry P. Doggrell	389,463

(1) Dr. Wills' base salary reflects his agreement with GTx to work part time but to make himself available at all other times as may be required.

Following the results of the company's ASTRID trial, the GTx Compensation Committee did not adjust any base salaries for 2019, and determined to maintain existing executive base salary levels at the beginning of 2019 at the same levels that existed in 2018.

Annual Bonus Plan

General. The GTx Compensation Committee first established the GTx Bonus Plan in 2007 as a means of rewarding executive officers for their role in achieving specified annual or short-term performance goals. The potential for payments under the GTx Bonus Plan for any fiscal year is generally based on the attainment of pre-established, objective performance goals approved by the GTx Compensation Committee at the beginning of the year. Each year, unless cash bonus award eligibility under the GTx Bonus Plan is suspended or eliminated for the relevant year, the GTx Compensation Committee approves the objective performance goals and specific criteria, including the weight attributable to each objective, and, if applicable, any weighting for specific categories of performance objectives, for each executive officer. The GTx Compensation Committee (as it did for bonus eligibility under the Bonus Plan for 2018) may include a subjective, discretionary bonus payment opportunity based on the GTx Compensation Committee's assessment of the executive officer's personal performance. Historically, the GTx Compensation Committee solicits and considers the recommendations of senior management officers in making these determinations.

The objective criteria for the GTx Bonus Plan can vary each year and may include the achievement of the operating budget for GTx, personnel-related objectives, continued innovation in development and progress towards the clinical development of GTx product candidates, timely development of new product candidates or processes, implementation of financing strategies, including licensing and/or asset dispositions that raise near-term capital for GTx and provide opportunities for increased stockholder value, the establishment of strategic alliances, partnerships or collaborations with third parties, and meeting preclinical, clinical, or regulatory objectives.

Although the GTx Compensation Committee typically approves the performance goals and specific criteria prior to the start of or early in the applicable calendar year, it retains the discretion to modify or otherwise change the objectives during the applicable calendar year. In addition, under the GTx Bonus Plan, the GTx Compensation Committee has the discretion to make additional bonus awards, apart from those related to the achievement of specified performance objectives.

Bonus Plan for 2018. In December 2017, the GTx Compensation Committee initially approved the performance criteria to be achieved in order for the executive officers to be eligible to receive cash bonus awards under the Bonus Plan for the performance period from January 1, 2018 through December 31, 2018. In March 2018, the GTx Compensation Committee revised the performance criteria to allocate most of the cash bonus award potential to the attainment of enrollment goals in the ASTRID trial, within a designated time period, and to the achievement of certain clinical results in the ASTRID trial. For 2018, an executive officer could have received: (i) 40% of such executive officer's target bonus as a result of the achievement of enrollment goals in the ASTRID trial within a designated time period; (ii) 50% of such executive officer's target bonus as a result of the achievement of certain clinical results in the ASTRID trial; and (iii) 10% of such executive officer's target bonus related to certain pre-clinical goals related to the SARD technology. However, in the event that a strategic transaction resulted in the cancelation or modification of any of the milestone events set forth above prior to their anticipated occurrence, any such milestone events that had been canceled or modified would have been deemed to have been fulfilled and the commensurate bonus payment or payments associated with such milestone events would have become payable. Additionally, an executive officer was eligible for a bonus award of up to 10% of his or her target bonus based on the GTx Compensation Committee's assessment of the executive officer's personal performance. Accordingly, an executive officer's actual total bonus award could have been awarded at a level above target. As in 2017, the potential bonus payments under the Bonus Plan for 2018 were 65% of base salary for Mr. Hanover and Dr. Wills and 35% of base salary for the other executive officers of the company. Also as in 2017, actual cash bonus awards under the Bonus Plan for 2018 generally were paid upon the achievement of the applicable performance criteria.

Fiscal Year 2018 Payouts. A bonus payment equal to approximately 40% of each named executive officer's target bonus payment was paid in April 2018 following the achievement of the enrollment goals in the ASTRID trial. No other bonus payments tied to the objective performance criteria for 2018 were earned by the named executive officers, and no discretionary bonus payments were awarded to the GTx named executive officers. Below is a summary of each named executive officer's target bonus and actual bonus for 2018 under the Bonus Plan:

Fiscal Year 2018 Bonus Plan Results

Named Executive Officer	Total Target Award ($)	Target Percentage (% of Base Salary)	Total Amount Actually Awarded ($)
Marc S. Hanover	289,658	65	115,863
Robert J. Wills, Ph.D.	147,290	65	58,916
Henry P. Doggrell	136,212	35	54,525

Bonus Plan for 2019. Following the results from the ASTRID trial, the GTx Compensation Committee determined that the executive's focus should be on developing strategies for the Board's consideration to maximize stockholder value, given the diminished prospects for the company, including partnering, collaborating or selling the company's remaining assets or selling or merging the company with interested third parties. The GTx Compensation Committee felt that it was not appropriate to develop a Bonus Plan for 2019 that would reward executives for attaining any specific goals since trying to formulate a plan to realize stockholder value was deemed paramount, even if it meant that some or all company employees may lose their employment depending on the strategies the Board decided to adopt.

Option Awards

Option Awards for 2018. In December 2017, the GTx Compensation Committee approved the grant of stock options to purchase 65,000 shares of GTx common stock to each of Mr. Hanover and Dr. Wills, and a stock option to purchase 45,000 shares of GTx common stock to Mr. Doggrell, each of which grants was effective on January 1, 2018. The stock options vest in three equal annual installments beginning January 1, 2021, subject to continuous service, thus providing long term incentive compensation for those employees who remain with GTx and increase stockholder value. The exercise price for these stock options is $12.71 per share, the closing price of GTx's common stock on December 29, 2017, the last trading day of 2017. The stock options expire on December 31, 2027, unless they are forfeited or expire earlier in accordance with their terms.

Option Awards for 2019. There were no stock options awarded to company employees as of January 1, 2019, due to the results of the ASTRID trial.

General Provisions of Stock Option Awards. All options granted to the GTx named executive officers may be exercised with cash, provided that the Board or the GTx Compensation Committee may provide that the exercise price may also be paid by delivery to GTx of other unencumbered shares of GTx common stock with a value equal to the aggregate option exercise price, pursuant to a cashless exercise program, or in any other form of legal consideration that may be acceptable to the Board or the GTx Compensation Committee (which may include a "net exercise" of the option). As a general matter, the vested portion of the stock options granted to the GTx named executive officers in 2018 and in previous years will expire three months after the named executive officer's last day of service with us, subject to extension in certain termination situations as described below under "*—Post-Termination Compensation—Stock Option and Equity Plan Provisions—Extended Post-Termination Option Exercise Period*" below. Events that can accelerate the vesting of GTx's stock options are described below under "*—Post-Termination Compensation—Stock Option and Equity Plan Provisions—Stock Award Vesting Acceleration*" below.

The number of shares of common stock of GTx underlying the foregoing options will be adjusted appropriately to reflect the GTx Reverse Stock Split.

Employment Agreements

Each of the GTx named executive officers has entered into a written employment agreement with GTx. Descriptions of the employment agreements with the GTx named executive officers are included under the caption "*—Post-Termination Compensation—Employment Agreements*" below.

Other Compensatory Arrangements

For a description of the other elements of the GTx executive compensation program, see "*—Post-Termination Compensation—Retirement and Other Benefits*." Except for the benefits described under "*—Post-Termination Compensation—Retirement and Other Benefits*," GTx does not generally provide its executive officers with any other perquisites and benefits that differ from what are provided to GTx employees generally. To date, the GTx Compensation Committee has not generally considered the provision of such additional perquisites and benefits to be a necessary element of GTx's executive compensation program. However, GTx may, from time to time, offer certain perquisites and benefits to its executive officers not offered to the general employee population, such as commuting, relocation and temporary housing benefits. In this regard, GTx reimbursed travel-related expenses for Dr. Wills in 2018 for travel between his out-of-state permanent residence and GTx's headquarters in Memphis, Tennessee. Upon the recommendation of the GTx Compensation Committee, the Board also approved tax gross-up payments to Dr. Wills related to these expense reimbursements, as the reimbursements are taxable to Dr. Wills as imputed income. The GTx Compensation Committee believes that the provision of tax gross-up payments to Dr. Wills to offset the tax obligation associated with these imputed income amounts was appropriate and necessary for retaining Dr. Wills.

Outstanding Equity Awards at Fiscal-Year End

The following table summarizes the number of outstanding equity awards held by each of the GTx named executive officers as of December 31, 2018. There were no stock awards outstanding as of December 31, 2018. The number of shares of common stock of GTx underlying the following options will be adjusted appropriately to reflect the GTx Reverse Stock Split.

OUTSTANDING EQUITY AWARDS AT 2018 FISCAL-YEAR END

	Option Awards			
Name	Number of Securities Underlying Unexercised Options (#) Exercisable	Number of Securities Underlying Unexercised Options (#) Unexercisable(1)	Option Exercise Price ($)	Option Expiration Date
Marc S. Hanover				
	7,000	—	42.00	12/31/19
	7,000	—	26.50	12/31/20
	7,000	—	33.60	12/31/21
	9,000	— (2)	42.00	12/31/22
	40,000	10,000(3)	15.60	04/02/24
	16,667	8,333(4)	13.30	06/04/24
	—	40,000(5)	7.00	12/31/25
	—	95,000(6)	4.71	02/27/27
	—	65,000	12.71	12/31/2027
Robert J. Wills		(4)		
	—	40,000(5)	7.00	12/31/25
	—	95,000(6)	4.71	02/27/27
	—	65,000	12.71	12/31/2027
Henry P. Doggrell				
	3,500	—	42.00	12/31/19
	3,500	—	26.50	12/31/20
	3,500	—	33.60	12/31/21
	5,500	—	42.00	12/31/22
	10,000	— (3)	18.80	09/30/23
	13,334	6,666(4)	13.30	06/04/24
	—	25,000(5)	7.00	12/31/25
	—	80,000(6)	4.71	02/27/27
	—	45,000	12.71	12/31/2027

(1) All options have a term of ten years from the date of grant. In addition to the specific vesting schedule for each stock option, each unvested stock option is subject potential future vesting acceleration as described under the heading "*—Post-Termination Compensation*" below. Pursuant to the Merger Agreement, all of these options will vest immediately prior to the consummation of the merger.

(2) One-fifth of the shares subject to the option vested on each of April 3, 2015, April 2, 2016, April 3, 2017 and April 3, 2018, with the remaining shares vesting as to one-fifth of the shares on April 3, 2019.

(3) One-third of the shares subject to the option vested on each of June 5, 2017 and June 5, 2018, with the remaining shares vesting as to one-third of the shares on June 5, 2019.

(4) One-third of the shares subject to the option vested on January 1, 2019, with the remaining shares vesting as to one-third of the shares on each of January 1, 2020 and January 1, 2021.

(5) One-third of the shares subject to the option will vest on each of February 28, 2020, February 28, 2021 and February 28, 2022.

(6) One-third of the shares subject to the option will vest on each of January 1, 2021, January 1, 2022 and January 1, 2023.

Option Exercises and Stock Vested During 2018

The following table provides information on restricted stock unit, or RSU, awards vested and the value realized, determined as described below, for the named executive officers during the year ended December 31, 2018. No stock options were exercised by the named executive officers during the year ended December 31, 2018.

	Stock Awards	
Name	Number of Shares Acquired on Vesting (#)	Value Realized on Vesting ($)(1)
Marc S. Hanover	45,000	571,950
Robert J. Wills	33,333	560,328
Henry P. Doggrell	30,000	381,300

(1) The value realized on vesting is based on the number of shares underlying the RSU awards that vested and the closing price of GTx common stock on the vesting date (or, in the case of RSU awards vesting on a day that was not a trading day, the closing price of GTx common stock on the immediately preceding trading day).

Post-Termination Compensation

GTx has entered into employment agreements with each of the GTx named executive officers. Described below are the circumstances that would trigger GTx's obligation to make cash payments pursuant to these employment agreements following the termination of a named executive officer's employment with GTx and the cash payments that GTx would be required to provide. We also describe below the termination and change of control events that would trigger the accelerated vesting of stock options and the extension of the post-termination exercise period with respect to those stock options.

Employment Agreements

Termination Without "Cause" or For "Good Reason" after a Change of Control

The employment agreements with the GTx named executive officers provide for cash post-termination change of control payments equal to one year's base salary and, for those executives eligible for COBRA under federal law, monthly premium payments to continue the named executive officer's health insurance coverage for up to 12 months following his or her termination. These change of control salary continuation and health insurance coverage benefits are structured on a "double-trigger" basis, meaning that before a named executive officer is eligible to receive such change of control benefits, (1) a change of control must occur and (2) within 12 months after such change of control, the named executive officer's employment must be terminated without "cause" or the named executive officer must resign for "good reason." GTx's obligation to make the salary continuation payments and health insurance premium payments under the employment agreements is conditioned upon the former named executive officer's compliance with the confidentiality provisions of the employment agreement and the provisions of the non-competition provisions of the employment agreement for a period of one year following termination. In addition, GTx's obligation to make the salary continuation payments and health insurance premium payments is conditioned upon GTx's receipt of an effective general release of claims executed by the named executive officer. The post-termination salary continuation payments will either be made over the one-year period following termination on the regular payroll dates or in a lump sum, except that the timing of the monthly payments may be deferred for up to six months if those payments would constitute deferred compensation under Section 409A of the Internal Revenue Code (in which case, the deferred payment would be made in a lump sum following the end of the deferral period, with the balance being paid thereafter on the regular payroll dates).

A change of control generally means the following:

- the sale or other disposition of all or substantially all of GTx's assets (including a liquidation or dissolution of GTx);
- if any person or group acquires beneficial ownership of 50% or more of GTx's voting securities (subject to certain exceptions);
- a merger or consolidation of GTx with or into any other entity, if immediately after the transaction more than 50% of the voting stock of the surviving entity is held by persons who were not holders of at least 50% of GTx's voting stock as of the effective date of the named executive officer's employment agreement; or
- a majority of the GTx Board becomes comprised of individuals whose nomination, appointment, or election was not approved by a majority of the Board members or their approved successors.

"*Cause*" is generally defined as the named executive officer's:

- conviction for a felony;
- theft, embezzlement, misappropriation of or intentional infliction of material damage to GTx's property or business opportunities;
- breach of his or her confidentiality or non-competition obligations, as applicable, under his or her employment agreement; or
- ongoing willful neglect of or failure to perform his or her duties, or his or her ongoing willful failure or refusal to follow any reasonable, unambiguous duly adopted written direction that is not inconsistent with the description of such named executive officer's duties, provided that such willful neglect or failure is materially damaging or materially detrimental to the business and operations of GTx, and after 30 days' notice and the opportunity to cure.

"*Good reason*" is generally defined as the following actions taken without the consent of the named executive officer after a change of control (in each case where the named executive officer has provided written notice within 30 days of the action, such action is not remedied by GTx within 30 days following such notice, and the named executive officer's resignation is effective not later than 60 days after the expiration of such 30-day cure):

- an adverse change in the named executive officer's authority, duties or responsibilities (including reporting responsibilities) which, without the named executive officer's consent, represents a material reduction in or a material demotion of the named executive officer's authority, duties or responsibilities as in effect immediately prior to the change of control, or the assignment to the named executive officer of any duties or responsibilities that are materially inconsistent with and materially adverse to such authority, duties or responsibilities;
- a material reduction in the then current base salary of the named executive officer;
- the relocation of the named executive officer's principal office to a location that increases his one-way commute by more than 20 miles (or, in the case of Dr. Wills, a relocation outside of New Jersey);
- the failure of GTx to obtain an agreement reasonably satisfactory to the named executive officer from any successor entity upon the change of control to assume and agree to perform his or her employment agreement in all material respects; or
- a material breach by GTx of any provision of the named executive officer's employment agreement or any other then-effective agreement with the named executive officer.

Termination Without "Cause" or For "Good Reason" Prior to or Not in Connection with a Change of Control

The employment agreement with Dr. Wills provides for cash post-termination payments equal to one year's base salary (either to be made over the one-year period following termination on the regular payroll dates or in a lump

sum payment) and monthly premium payments to continue his health insurance coverage for up to 12 months following his termination, should his employment be terminated without "cause" or should he resign for "good reason", in each case irrespective of whether such termination is within 12 months after (or otherwise in connection with) a change of control.

Other Termination Scenarios

If GTx terminates a named executive officer's employment for "cause," or if a named executive officer voluntarily terminates his or her employment without "good reason," or upon the death of a named executive officer, the named executive officer would generally have no right to receive any compensation or benefits under his or her employment agreement on or after the effective date of termination, other than any accrued and unpaid salary and expense reimbursement. However, under the employment agreements with Dr. Wills, Dr. Wills would nonetheless be entitled to any earned but unpaid annual bonus with respect to any completed calendar year immediately preceding his termination date. Likewise, except as described above under "*—Termination Without "Cause" or For "Good Reason" Prior to or Not in Connection with a Change of Control*" with respect to Dr. Wills, if GTx terminates a named executive officer's employment without "cause," or if a named executive officer voluntarily terminates his or her employment with "good reason," in each case not within 12 months following a change of control, the named executive officer would have no right to receive any compensation or benefits under his employment agreement on or after the effective date of termination, other than any accrued and unpaid salary and expense reimbursement and, solely in the case of Dr. Wills, subject to GTx's obligation under his employment agreement to pay any accrued but unpaid annual bonus with respect to any completed calendar year immediately preceding his termination date.

Other Employment Agreement Benefits

Except as set forth above, under the employment agreements with the GTx named executive officers, the named executive officers would not be entitled to any other benefits following termination of service, including the continuation of general employee benefits, life insurance coverage and long term disability coverage, except as otherwise required by applicable law.

Stock Option and Equity Plan Provisions

Stock Award Vesting Acceleration

Under the Merger Agreement, as of immediately prior to the Effective Time, the vesting of all outstanding options to purchase shares of common stock of GTx, including those held by GTx's executive officers and directors, will accelerate in full. The number of shares of common stock of GTx underlying such options and the exercise price of such options will be adjusted appropriately to reflect the GTx Reverse Stock Split.

The terms of the GTx equity plans provide for additional accelerated exercisability that could apply in other scenarios, as described below.

2004 Plan. Our 2004 Equity Incentive Plan, or the 2004 Plan, provides that in the event of a specified corporate transaction such as a merger, consolidation or similar transaction, all outstanding options under the 2004 Plan may be assumed, continued or substituted for by any surviving or acquiring entity. If the surviving or acquiring entity elects not to assume, continue or substitute for such options, such options then held by individuals whose service has not terminated prior to the effective date of the corporate transaction would become fully vested, and, if applicable, exercisable and such options would be terminated if not exercised within 90 days of the effective date of the corporate transaction. A recipient's award agreement may provide for acceleration upon other events. In this regard, the standard form of stock option agreement under the 2004 Plan provides for each stock option to become fully vested and exercisable if (i) the optionholder's service with GTx or its successor terminates within twelve months after a change of control and the termination of service is a result of an involuntary termination

without cause or a constructive termination or (ii) the optionholder is required to resign his or her position with GTx as a condition of the change of control. For purposes of our 2004 Plan, the definition of change of control is similar to the definition of change of control under the employment agreements with our named executive officers. As a result of the adoption of the 2013 Plan, we no longer grant any equity awards under the 2004 Plan, and stock options were the only form of stock awards granted to our named executive officers under the 2004 Plan.

The standard form of stock option agreement under the 2004 Plan generally defines "cause" as the grant recipient:

- committing an act that materially injures the business of GTx;
- refusing or failing to follow the lawful and reasonable directions of the Board or the appropriate individual to whom he or she reports, after 15 days' notice and the opportunity to cure;
- willfully or habitually neglecting his or her duties with GTx, after 15 days' notice and the opportunity to cure;
- being convicted of a felony that is likely to inflict or has inflicted material injury on the business of GTx; or
- committing a material fraud, misappropriation, embezzlement or other act of gross dishonesty that resulted in material loss, damage or injury to GTx.

The standard form of stock option agreement under the 2004 Plan generally defines a "constructive termination" as a voluntary termination within 12 months after a change of control after any of the following actions are taken without the consent of the grant recipient:

- the assignment to the grant recipient of any duties or responsibilities which results in a significant reduction in his or her function as in effect immediately prior to the change of control;
- a material reduction in the grant recipient's salary, as in effect on the effective date of the change of control;
- the failure to continue in effect any benefit plan or program in which the grant recipient was participating immediately prior to the effective date of the change of control, or the taking of any action that would adversely affect his or her participation in (or reduce his or her benefits under) any such benefit plan or program (but either circumstance will only be grounds for a "constructive termination" if the range of benefit plans and programs offered by the acquirer is not comparable to the benefit plans previously offered by GTx, when considered as a whole);
- a relocation of the grant recipient's principal office to a location more than 50 miles from the location at which he or she performed his or her duties as of the effective date of the change of control; or

a material breach by GTx of any provision of the grant recipient's stock option agreement under the 2004 Plan.

2013 Plan. The GTx 2013 Plan provides that in the event of a specified corporate transaction such as a merger, consolidation or similar transaction, all outstanding stock awards under the 2013 Plan may be assumed, continued or substituted for by any surviving or acquiring entity, and any reacquisition or repurchase rights held by GTx in respect of common stock issued pursuant to outstanding stock awards may be assigned by GTx to its successor (or the successor's parent company). If the surviving or acquiring corporation does not assume, continue or substitute any or all such outstanding stock awards, then with respect to stock awards that have not been assumed, continued or substituted and that are held by participants whose continuous service has not terminated prior to the effective time of the corporate transaction, the vesting (and, if applicable, the exercisability) of such stock awards will (contingent upon the effectiveness of the corporate transaction) be accelerated in full to a date prior to the effective time of the corporate transaction as the Board determines (or, if

the Board does not determine such a date, to the date that is five days prior to the effective time of the corporate transaction), such stock awards will terminate if not exercised (if applicable) at or prior to the effective time of the corporate transaction, and any reacquisition or repurchase rights held by GTx with respect to such stock awards will (contingent upon the effectiveness of the corporate transaction) lapse. Unless otherwise provided in a written agreement between GTx or an affiliate and a participant, the vesting (and, if applicable, the exercisability) of any other outstanding stock awards that are not assumed, continued or substituted in connection with the corporate transaction will not be accelerated and such stock awards will terminate if not exercised (if applicable) prior to the effective time of the corporate transaction. A recipient's award agreement may provide for acceleration upon other events. In this regard, the standard form of stock option agreement under the 2013 Plan provides for each stock option to become fully vested and exercisable if the optionholder's service with GTx or its successor terminates on or within 12 months after a change of control and the termination of service is a result of an involuntary termination without cause or a constructive termination. In addition, if a stock option is assumed, continued or substituted for in a change in control and a participant's service terminates as a condition to such change in control or upon the effectiveness of the change in control, such stock option would remain exercisable for 12 months post-termination.

For purposes of the GTx 2013 Plan, the definition of change of control is similar to the definition of change of control under the employment agreements with the executive officers.

For purposes of the GTx 2013 Plan, "cause" has the meaning ascribed to such term in any written agreement between the grant recipient and GTx, and in the absence of such an agreement, "cause" means the occurrence of any of the following:

- the grant recipient's willful failure substantially to perform his or her duties and responsibilities or deliberate violation of a company policy;
- the grant recipient's commission of any act of fraud, embezzlement, dishonesty or any other willful misconduct that has caused or is reasonably expected to result in material injury to GTx;
- unauthorized use or disclosure by the grant recipient of any proprietary information or trade secrets of GTx or any affiliate or any other party to whom the grant recipient owes an obligation of nondisclosure as a result of the grant recipient's relationship with GTx or any affiliate; or
- the grant recipient's willful breach of any of his or her obligations under any written agreement or covenant with GTx or any affiliate.

The definition of a "constructive termination" in the standard form of stock option agreement under the 2013 Plan is similar to the definition of a "constructive termination" in the standard form of stock option agreement under the 2004 Plan, except that a constructive termination would also be deemed to occur if the board of GTx's successor requires the participant to resign from GTx in a manner that terminates the participant's continuous service, as a condition of the change in control. In addition, in order to have a basis for constructive termination under the 2013 Plan, a participant must provide written notice of the event giving rise to constructive termination to the board of GTx's successor within 30 days following such event, provide the successor with 30 days to cure such event, and, if not cured, the participant must resign from all positions then held with GTx and its successor not later than six months after the date of the participant's written notice to the board of the successor (or such earlier date as may be requested by the Board).

Extended Post-Termination Option Exercise Period

As a general matter, the terms of the options GTx has granted to its executive officers and directors provided that the vested portion of these options will expire three months after the executive officer's or director's termination of service. The period following the executive officer's or director's termination during which he or she can continue to exercise his or her vested stock options is referred to as the post-termination exercise period. However, in connection with the adoption of a retention bonus program by the GTx Compensation Committee in

September 2013, the options held by certain of the executive officers and outstanding on or prior to September 27, 2013 were modified to generally provide for a six month post-termination exercise period. In addition, a retention stock option granted to Mr. Doggrell in 2013 generally provides for a six month post-termination exercise period. All such post-termination exercise periods are limited by, and will not exceed, the original expiration date of the option. The terms of the retention benefit agreements with our executive officers will, however, be less favorable than the terms for an extension of the post-termination exercise period provided under the terms of our equity plans, as. Such more favorable terms will apply under the circumstances described below.

Under the GTx 2004 Plan and the form of stock option agreement under the GTx 2004 Plan, the post-termination exercise period will generally be one year following termination if the termination of service is a result of an involuntary termination without cause or a constructive termination within 12 months after a change of control. Under the GTx 2013 Plan and the form of stock option agreement under the GTx 2013 Plan, the post-termination exercise period will generally be one year following termination if the termination of service occurs either as a condition of a change of control or upon the effectiveness of a change of control, unless the stock option is not assumed, continued or replaced by the successor or acquiring entity. If the termination is a retirement, the exercise period will be two years under each of the GTx 2004 Plan and GTx 2013 Plan. Currently, Messrs. Hanover and Doggrell are retirement-eligible.

With respect to all of GTx's stock option plans and the forms of stock option agreements under such stock option plans, if the termination is due to the named executive officer's death, the post-termination exercise period will generally be 18 months following termination, and if the termination is due to the named executive officer's disability, the post-termination exercise period will generally be one year following termination. With respect to the GTx 2013 Plan and the form of stock option agreement under the GTx 2013 Plan, if the termination is for cause, the option will terminate upon the date on which the event giving rise to the termination for cause first occurred (or, if required by law, the date of the termination). With respect to the GTx 2001 Plan and the GTx 2002 Plan and the forms of stock option agreements under those plans, if a named executive officer voluntarily retires his or her employment (which generally means a retirement after age 65 or after age 55 following a specified period of service), the post-termination exercise period will generally be five years following termination. However, the GTx 1999 Plan and the GTx 2000 Plan provide that the GTx Compensation Committee in its discretion can provide for any post-termination exercise period for a vested option in the event of the disability, death or involuntary termination of an option grant recipient of up to, but not exceeding, the initial ten-year term of the option. Under the GTx 2004 Plan and the GTx 2013 Plan and the forms of stock option agreements under those plans, if a named executive officer voluntarily retires his or her employment (which generally means a retirement after age 65 following a specified period of service or after age 55 following a specified period of service and with the authorization of our Chief Executive Officer or the GTx Board), the post-termination exercise period will generally be two years following termination. Currently, Messrs. Hanover and Doggrell are retirement-eligible. In no event, however, will the post-termination exercise period be extended beyond the initial ten-year term of the option.

The standard form of stock option agreement under the 2004 Plan generally defines "cause" as the grant recipient:

- committing an act that materially injures the business of GTx;
- refusing or failing to follow the lawful and reasonable directions of the Board or the appropriate individual to whom he or she reports, after 15 days' notice and the opportunity to cure;
- willfully or habitually neglecting his or her duties with GTx, after 15 days' notice and the opportunity to cure;

- being convicted of a felony that is likely to inflict or has inflicted material injury on the business of GTx; or
- committing a material fraud, misappropriation, embezzlement or other act of gross dishonesty that resulted in material loss, damage or injury to GTx.

The standard form of stock option agreement under the 2004 Plan generally defines a "constructive termination" as a voluntary termination within 12 months after a change of control after any of the following actions are taken without the consent of the grant recipient:

- the assignment to the grant recipient of any duties or responsibilities which results in a significant reduction in his or her function as in effect immediately prior to the change of control;
- a material reduction in the grant recipient's salary, as in effect on the effective date of the change of control;
- the failure to continue in effect any benefit plan or program in which the grant recipient was participating immediately prior to the effective date of the change of control, or the taking of any action that would adversely affect his or her participation in (or reduce his or her benefits under) any such benefit plan or program (but either circumstance will only be grounds for a "constructive termination" if the range of benefit plans and programs offered by the acquirer is not comparable to the benefit plans previously offered by GTx, when considered as a whole);
- a relocation of the grant recipient's principal office to a location more than 50 miles from the location at which he or she performed his or her duties as of the effective date of the change of control; or
- a material breach by GTx of any provision of the grant recipient's stock option agreement under the 2004 Plan.

Retirement and Other Benefits

GTx does not provide its employees, including its named executive officers, with a defined benefit pension plan, any supplemental executive retirement plans or retiree health benefits. The GTx named executive officers may participate on the same basis as other employees in the 401(k) retirement savings plan. GTx's 401(k) retirement savings plan provides an employer matching contribution of 100% of the first 4% of the employee's eligible compensation, subject to the annual Internal Revenue Service limits in effect from time to time. GTx believes this matching contribution is consistent with market practice and helps in attracting and retaining key executives. The GTx 401(k) plan will be terminated prior to the closing of the merger.

GTx offers a comprehensive employee benefit program, including health, life and disability insurance, to all of its regular employees, including certain of its named executive officers who are full time employees. This program provides a safety net of protection against the financial catastrophes that can result from illness, disability or death. Company-funded life insurance of up to $50,000 is provided to employees generally, and company-funded long-term disability insurance provides a 60% income-replacement benefit, up to $10,000 per month.

The GTX Compensation Committee has also approved supplemental life and long-term disability insurance for GTx's executive officers. The total life insurance benefit for Mr. Hanover and certain eligible Vice Presidents is equal to twice the executive officer's annual salary, not to exceed $1 million in coverage for any officer, although Mr. Doggrell's total coverage amount was reduced 65% following his 65th birthday. Dr. Wills, as a part time employee, does not quality for health, life or disability insurance and other similar benefits pursuant to the requirements of the insurers' programs. However, should he in the future be deemed to be a "full time" employee by the insurers, he would also receive the same benefits as are presently provided to Mr. Hanover and eligible Vice Presidents. The GTx Compensation Committee believes that the cost of providing this supplemental insurance coverage is minimal in comparison to the value of such benefits in attracting and retaining executive employees and that providing these supplemental benefits is consistent with the practices of other public companies.

Compensation and Risk

In March 2018, the GTx Compensation Committee considered the GTx compensation policies, practices and programs as generally applicable to its employees and determined that its policies, practices and programs do not encourage excessive or unnecessary risk-taking, and that the level of risk that they do encourage is not reasonably likely to have a material adverse effect on GTx. The design of the GTx compensation policies and programs encourage GTx employees to remain focused on its long-term goals of increasing stockholder value through the successful development of clinical product candidates. For example, through the use of different types of equity compensation awards that provide long term incentives to increase GTx's share price, as well as GTx's use of multi-year vesting for stock option, GTx believes that its employee compensation programs promote a long-term stockholder perspective, encourage decisions that will result in sustainable performance over the longer term, and mitigate the risks associated with an undue short-term focus on results.

GTx Director Compensation

Cash Retainers

The GTx Board has approved the GTx Director Compensation Policy, pursuant to which the following cash compensation payments are made quarterly to the GTx Board and committee members:

- a $35,000 annual retainer for service as a member of the GTx Board;
- a supplemental annual retainer for the Lead Director of the Board and for the Chairs of each Board committee in the following amounts: $15,000 for the Lead Director of the Board; $17,500 for Chair of the Audit Committee; $10,000 for Chair of the GTx Compensation Committee; and $8,500 for Chair of the Nominating and Corporate Governance Committee; and
- a supplemental annual retainer for each member of the following committees other than the Chairs, in the following amounts: $10,000 for members of the Audit Committee; $7,500 for members of the GTx Compensation Committee; $5,000 for members of the Nominating & Corporate Governance Committee; and $10,000 for members of the Scientific and Development Committee.

No directors currently receive consulting fees from GTx. Directors who are also employees (currently Mr. Hanover and Dr. Wills) receive no additional compensation for service on the Board.

Directors' Deferred Compensation Plan

Since June 30, 2004, the GTx non-employee directors have had the opportunity to defer all or a portion of their fees under the GTx Directors' Deferred Compensation Plan. Deferrals can be made into a cash account, a stock account, or a combination of both. Deferrals into a cash account would accrue interest at the prime rate of interest announced from time to time by a local bank utilized by us, and deferrals into a stock account accrue to the deferring director rights in shares of GTx common stock equal to the cash compensation then payable to the director for his or her GTx Board service divided by the then current fair market value of GTx common stock. As of March 31, 2019, five of GTx's non-employee directors held Deferred Stock Rights, and an aggregate of 155,426 shares of GTx common stock were issuable pursuant to the GTx Deferred Stock Rights. In addition, as of March 31, 2019, two of GTx's non-employee directors had elected to defer compensation under the GTx Director Deferred Compensation Plan after January 3, 2019, which deferrals will be paid to the non-employee directors at the closing in cash. Under the Directors' Deferred Compensation Plan, amounts credited to cash or stock accounts are distributed in a single lump sum on the date, if any, selected by the director pursuant to his or her election or, if no such election is made or if the selected distribution date is after his or her separation from service, then the distribution would be made on the date of his or her separation from service in the form of a single lump sum (subject to deferral under certain circumstances to the extent necessary to avoid the incurrence of adverse personal tax consequences under Section 409A of the Internal Revenue Code). Any fractional shares of GTx common stock will be distributed in cash valued at the then current fair market value of GTx common stock.

Under the Merger Agreement, as of immediately prior to the Effective Time (but in no event more than 30 days prior to the Effective Time), GTx shall take all actions necessary to cause the termination and liquidation of the GTx Deferred Stock Rights. As a result, the outstanding GTx Deferred Stock Rights will be settled at the closing in shares, to the extent shares have been credited to non-employee director stock accounts under the plan. GTx shall also ensure that any deferrals under the GTx Director Deferred Compensation Plan on or after January 3, 2019 shall be settled only in cash and that the maximum number of shares of common stock of GTx issuable upon settlement of the GTx Deferred Stock Rights shall be limited to the number of GTx Deferred Stock Rights outstanding as of the date of the Merger Agreement.

Equity Compensation

Pursuant to the GTx Director Compensation Policy, each non-employee director of GTx (who does not own more than ten percent of the combined voting power of GTx's then outstanding securities) is eligible for certain initial and annual stock awards, which grants are currently made pursuant to GTx's 2013 Non-Employee Director Equity Incentive Plan (the "2013 Directors' Plan"). Accordingly, each of the non-employee directors, with the exception of Mr. Hyde, is eligible to receive these initial and annual non-statutory stock awards. Under the GTx Director Compensation Policy, any individual who first becomes a non-employee director is eligible for a stock award in such form and in such amount that the Board deems necessary to attract such individual to join the Board. In addition, under the GTx Director Compensation Policy, any individual who is serving as a non-employee director on the day following an annual meeting of GTx's stockholders automatically will be granted an option to purchase shares of common stock on that date; provided, however, that if the individual has not been serving as a non-employee director for the entire period since the preceding annual meeting, the number of shares subject to such individual's annual grant will be reduced pro rata for each full month prior to the date of grant during which such individual did not serve as a non-employee director. In March 2018, the Board, upon the upon the recommendations of the Nominating and Corporate Governance Committee and the GTx Compensation Committee, determined that the number of shares subject to the automatic annual grants occurring on the date following the 2018 annual meeting of stockholders would be 7,500 shares of GTx common stock; accordingly, each non-employee director then serving as a non-employee director received a grant for 7,500 shares on the date following the 2018 annual meeting of stockholders. Following the results from the ASTRID trial, the Board made no determination about stock option grants for Board members in 2019.

The shares subject to each initial grant and each annual grant vest in a series of three successive equal annual installments measured from the date of grant, so that each initial grant and each annual grant will be fully vested three years after the date of grant. The exercise price per share for the options granted under the 2013 Directors' Plan is not less than the fair market value of the stock on the date of grant. Prior to the adoption of the 2013 Directors' Plan at the 2013 annual meeting of stockholders, initial and annual stock option grants were made pursuant to the Prior Directors' Plan.

In the event of a specified corporate transaction, as defined in the Prior Directors' Plan or the 2013 Directors' Plan, as applicable, all outstanding options granted under the Prior Directors' Plan and the 2013 Directors' Plan may be assumed or substituted for by any surviving or acquiring entity. If the surviving or acquiring entity elects not to assume or substitute for such options, then (a) with respect to any such options that are held by optionees then performing services for GTx or its affiliates, the vesting and exercisability of such options will be accelerated in full and such options will be terminated if not exercised prior to the effective date of the corporate transaction, and (b) all other outstanding options will terminate if not exercised prior to the effective date of the corporate transaction. If a specified change of control transaction occurs, as defined in the Prior Directors' Plan, then the vesting and exercisability of the optionee's options granted under the Prior Directors' Plan will be accelerated in full immediately prior to (and contingent upon) the effectiveness of the transaction. Under the Prior Directors' Plan, if an optionee is required to resign his or her position as a non-employee director as a condition of the change of control transaction, the vesting and exercisability of the optionee's options will be accelerated in full immediately prior to the effectiveness of such resignation. Under the 2013 Directors' Plan, if a specified change of control transaction occurs, as defined in the 2013 Directors'

Plan, then all stock awards held by a participant whose continuous service has not terminated prior to such time will become fully vested and, if applicable, exercisable, immediately prior to the transaction. In addition, under the 2013 Directors' Plan, if a non-employee director is required to resign his or her position as a non-employee director as a condition of the change of control transaction, all outstanding stock awards held by such individual will become fully vested and, if applicable, exercisable, as of immediately prior to such resignation. During 2008, the Board, upon the recommendation of the GTx Compensation Committee, adopted a general policy regarding the retirement of non-employee directors that provides that the Board will act, on a case-by-case basis, to accelerate the vesting and exercisability of the retiring director's options in full provided such director retires from the Board in good standing.

Pursuant to the merger agreement, all outstanding unvested options held by GTx's non-employee directors will vest upon the closing of the merger.

The table below represents the compensation earned by each non-employee director who served as a director on the GTx Board during 2018. Neither Mr. Hanover nor Dr. Wills are listed in the following table since they served as GTx employees during their respective term service on the GTx Board and did not receive any additional compensation for serving as members of the GTx Board. Each of Mr. Hanover's and Dr. Wills' compensation is described under "*Executive Compensation*" above.

GTX DIRECTOR COMPENSATION—FISCAL 2018

Name	Fees Earned or Paid in Cash ($)(1)	Option Awards ($)(2)	Total ($)
J. R. Hyde, III	62,500	—	62,500
Michael G. Carter, M.D.	65,000	99,197	164,197
J. Kenneth Glass	60,000	99,197	159,197
Garry A. Neil, M.D.	50,000	99,197	149,197
Kenneth S. Robinson, M.D., M.Div.	53,500	99,197	152,697

(1) Represents fees earned in 2018 that were either paid, deferred or were payable at the end of 2018. Each director in the table above, other than Mr. Glass and Dr. Carter elected to defer payment of all or a portion of his earned fees during 2018 pursuant to the Directors' Deferred Compensation Plan. The number of shares credited to individual stock accounts for the GTx non-employee directors under the Directors' Deferred Compensation Plan as of December 31, 2018 was as follows: 52,108 shares for Mr. Hyde; 3,631 shares for Dr. Carter; 655 shares for Mr. Glass; 22,224 shares for Dr. Neil and 44,105 shares for Dr. Robinson.

(2) The amounts in this column represent the aggregate grant date fair value of all option awards granted to the GTx non-employee directors during the year ended December 31, 2018 as computed in accordance with FASB ASC Topic 718. Assumptions used in computing the aggregate grant date fair value in accordance with FASB ASC Topic 718 are set forth in Note 3—Share-Based Compensation to the GTx financial statements included elsewhere in this proxy statement/prospectus/information statement.

The following table indicates the grant date fair value for the annual option awarded to each non-employee director during the year ended December 31, 2018, as determined in accordance with FASB ASC Topic 718, as well as the total number of shares subject to options outstanding as of December 31, 2018 for each non-employee director listed in the table above. Assumptions used in computing the aggregate grant date fair value in accordance with FASB ASC Topic 718 are set forth in Note 3—Share-Based Compensation to the GTx audited financial statements included herein.

Name	FASB ASC Topic 718 Grant Date Fair Value ($)	Total Shares Subject to Options Outstanding at 12/31/2018 (#)
J. R. Hyde, III	—	—
J. Kenneth Glass	99,197	46,500
Michael G. Carter, M.D.	99,197	46,500
Garry A. Neil, M.D.	99,197	28,750
Kenneth S. Robinson, M.D., M.Div.	99,197	46,500

Following completion of the merger, it is expected that the combined organization will provide compensation to non-employee directors. GTx's current director compensation program will be suspended at the time of the closing of the merger and the director compensation policies for the combined organization following the merger will be re-evaluated by the compensation committee and board of directors of the combined organization following completion of the merger and may be subject to change. Non-employee directors of the combined organization are, however, expected to receive annual cash retainers and equity compensation, although the amount of such compensation has not yet been determined.

EXECUTIVE COMPENSATION OF THE COMBINED COMPANY OFFICERS

Historically, Oncternal has had two executive officers, James B. Breitmeyer, President and Chief Executive Officer, and Richard Vincent, Chief Financial Officer. In March 2019, Hazel Aker joined Oncternal as its General Counsel. Each of Dr. Breitmeyer, Mr. Vincent and Ms. Aker are expected to serve as executive officers of the combined organization after the merger. Dr. Breitmeyer and Mr. Vincent served as the only executive officers of Oncternal during 2018 and are referred to herein as Oncternal's "named executive officers." After completion of the merger, the compensation committee of the combined organization's board of directors is expected to approve all compensation for the combined organization's executive officers. For additional information regarding the combined organization's compensation committee, please see the section entitled "Management Following the Merger—Committees of the Board of Directors—Compensation Committee" in this proxy statement/prospectus/information statement.

Summary Compensation Table

The following table sets forth certain summary information for the year indicated with respect to the compensation earned by Oncternal's named executive officers during 2018.

SUMMARY COMPENSATION TABLE

Name and Principal Position	Year	Salary ($)(1)	Bonus ($)	Option Awards ($)(2)	Non-Equity Incentive Plan Compensation ($)	All Other Compensation ($)	Total ($)
James B. Breitmeyer							
President and Chief Executive Officer	2018	426,028	—	92,000	—	—	518,028
Richard G. Vincent							
Chief Financial Officer	2018	206,000	—	40,000	—	—	246,000

(1) The amounts in this column represent base salary or 1099 income earned during the indicated fiscal year. Mr. Vincent served as Oncternal's Chief Financial Officer in 2018, as an independent contractor and not an employee, prior to his commencement of employment with Oncternal in January 2019. As such, the amounts reported as salary for him represent consulting fees paid to him for those services.

(2) The amounts in the column represent the aggregate grant date fair value of all option awards granted during 2017 and 2018 as determined in accordance with FASB ASC Topic 718. Assumptions used in computing the grant date fair values of the stock options in accordance with FASB ASC Topic 718 are set forth in Note 5 to the Oncternal financial statements included elsewhere in this proxy statement/prospectus/information statement. For more information on these stock options granted in 2018, see "*—Narrative Disclosure to Summary Compensation Table—Option Awards*" below.

Narrative Disclosure to Summary Compensation Table

Base Salary

Oncternal's Board recognizes the importance of base salary as an element of compensation that helps to attract and retain its executive officers. Oncternal provides base salary as a fixed source of income for its executives for the services they provide to Oncternal during the year.

Dr. Breitmeyer's base salary was increased to $475,000 from $425,000 in November 2018. Mr. Vincent's base salary of $300,000 was established by the Oncternal Board in connection with his commencement of employment in January 2019. Mr. Vincent was a consultant during 2018 and received a retainer of $12,000 per month for his services for up to eight days per month, plus a $200 per hour retainer for any hours in excess of that commitment. In total, Mr. Vincent received $206,000 in consulting fees during 2018.

Annual Bonus Plan

The employment offer letters with Oncternal's executive officers provide that they will be eligible to participate in any annual bonus plan established by the Oncternal Board. Oncternal did not establish a formal bonus plan for 2018 and none of Oncternal's executive officers received a bonus for 2018.

Option Awards

Oncternal's equity-based incentive awards are designed to align its interests and the interests of its stockholders with those of its employees and consultants, including the Oncternal named executive officers. The Oncternal Board or its compensation committee is responsible for approving equity grants.

In November 2018, the Oncternal Board approved the grant of stock options to Dr. Breitmeyer and Mr. Vincent under the Oncternal 2015 Plan. The terms and conditions, and the number of shares subject to these stock options, is described below in the "Outstanding Equity Awards at Fiscal Year-End" table.

For a description of the accelerated vesting applicable to the stock options granted to the Oncternal named executive officers, see "*—Post-Termination Compensation*" and "*—2015 Equity Incentive Plan*" below.

Employment Agreements

Each of Oncternal's executive officers has entered into a written employment offer letter with Oncternal. Descriptions of the employment offer letters with Oncternal's executive officers are included under the caption "*—Employment Agreements with Executive Officers and Post-Termination Compensation*" below.

Other Compensatory Arrangements

Oncternal's executive officers are eligible to participate in Oncternal's health and welfare plans on the same terms as all employees generally, including medical, dental and vision benefits, disability insurance and life insurance.

Oncternal does not generally provide its executive officers with any other perquisites and benefits that differ from what are provided to GTx employees generally. Oncternal has not historically maintained a 401(k) plan, but intends to adopt such a plan prior to the closing of the merger.

Outstanding Equity Awards at Fiscal-Year End

The following table summarizes the number of outstanding equity awards held by each of Oncternal's named executive officers as of December 31, 2018.

OUTSTANDING EQUITY AWARDS AT 2018 FISCAL-YEAR END

	Option Awards					Stock Awards	
Name	Number of Securities Underlying Unexercised Options (#) Exercisable(1)	Number of Securities Underlying Unexercised Options (#) Unexercisable(1)	Equity Incentive Plan Awards: Number of Securities Underlying Unexercised Unearned Options (#)	Option Exercise Price ($)	Option Expiration Date	Number of Shares or Units of Stock That Have Not Vested (#)	Market Value of Shares or Units of Stock That Have Not Vested ($)(7)
James B. Breitmeyer	(2)	(2)				(4)	
	1,300,000	300,000(3)	—	0.05	8/30/2025	145,958	$ 8,757
	—	2,300,000	—	0.06	11/14/2028	—	—
Richard G. Vincent						(5)	
						233,333(6)	$ 14,000
	—	1,000,000(2)	—	0.06	11/14/2028	116,923	$ 7,015

(1) All options have a term of ten years from the date of grant. In addition to the specific vesting schedule for each stock option, each unvested stock option is subject potential future vesting acceleration as described under the heading "*—Post-Termination Compensation*" below.
(2) One-fourth of the shares subject to the option vested on the first anniversary of the date of grant and the remainder vest in equal monthly installments over the thirty-six months thereafter.
(3) Subject to Dr. Breitmeyer's continuous service as Oncternal's Chief Executive Officer through the applicable vesting date, the option shall vest as follows: (a) 12.5% of the shares subject to the option shall vest on completion of the Phase 1 study of TK216 in Ewing sarcoma; (b) 12.5% of the shares subject to the option shall vest on completion of the Phase 1 study of TK216 in AML; (c) 12.5% of the shares subject to the option shall vest on completion of both Parts 1 and 2 of the Cirmtuzumab CLL/MCL study; (d) 12.5% of the shares subject to the option shall vest on such date as ROR1 CAR-T materials are ready for human testing; (e) 12.5% of the shares subject to the option shall vest on completion of the Phase 1 study for a ROR1 CAR-T; (f) 12.5% of the shares subject to the option shall vest on the consummation of a sale of Series D preferred stock, or comparable transaction, resulting in gross proceeds to Oncternal of at least $20 million in the aggregate (and if such financing is completed in tranches, satisfaction of this vesting event shall occur upon the closing of the tranche that results in the gross proceeds to Oncternal from such financing equaling or exceeding $20,000,000 in the aggregate); and (g) 25% of the options shall vest upon the occurrence of a firmly underwritten public offering of Oncternal's common stock on a Form S-1 Registration Statement, or comparable transaction.
(4) Reflects shares of restricted stock granted to Dr. Breitmeyer on February 26, 2016. The shares were subject to Oncternal's right to repurchase any unvested shares upon any termination of Dr. Breitmeyer's employment or service. The shares vested in equal monthly installments over the thirty-six months following the date of grant, and were fully vested in February 2019.
(5) Reflects shares of restricted stock granted to Mr. Vincent on May 22, 2017. The shares are subject to Oncternal's right to repurchase any unvested shares upon any termination of Mr. Vincent's employment or service. The shares vest as to one-fourth of the shares on the first anniversary of the date of grant and the remainder vest in equal monthly installments over the thirty-six months thereafter. In addition, the restricted shares are subject to potential future vesting acceleration as described under the heading "*—Post-Termination Compensation*" below.
(6) Reflects shares of restricted stock granted to Mr. Vincent on December 14, 2017. The shares are subject to Oncternal's right to repurchase any unvested shares upon any termination of Mr. Vincent's employment or service. The shares vest as to one-fourth of the shares on the first anniversary of the date of grant and the remainder vest in equal monthly installments over the thirty-six months thereafter. In addition, the restricted shares are subject to potential future vesting acceleration as described under the heading "*—Post-Termination Compensation*" below.
(7) The market value of the shares is calculated using a value of $0.06 per share, which was the fair market value per share of Oncternal's common stock as of December 31, 2018.

Option Exercises and Stock Vested During 2018

The following table provides information on restricted stock awards vested and the value realized, determined as described below, for the Oncternal named executive officers during the year ended December 31, 2018. No stock options were exercised by the Oncternal named executive officers during the year ended December 31, 2018.

	Stock Awards	
Name	Number of Shares Acquired on Vesting (#)	Value Realized on Vesting ($)(1)
James B. Breitmeyer	875,712	$ 52,543
Richard G. Vincent	205,640	$ 12,338

(1) The value realized on vesting is based on the number of shares underlying the restricted stock awards that vested and the fair market value of Oncternal's common stock on the vesting date.

Employment Agreements with Executive Officers and Post-Termination Compensation

Employment Offer Letter with James B. Breitmeyer

In May 2017, Oncternal entered into an employment offer letter with James B. Breitmeyer, Oncternal's President and Chief Executive Officer. Dr. Breitmeyer has agreed to devote all of his working time and attention to the business affairs of Oncternal. Dr. Breitmeyer is currently entitled to an annual base salary of $475,000 and a target annual bonus in an amount to be determined by the Oncternal Board.

Dr. Breitmeyer's employment offer letter provides for severance benefits upon a qualifying termination of employment, including modified severance benefits on a qualifying termination of employment following a change in control (each as defined below). If Oncternal terminates Dr. Breitmeyer's employment without cause (as defined below) or if he resigns for good reason (as defined below), he is entitled to the following payments and benefits, subject to a release of claims in favor of Oncternal: (1) his fully earned but unpaid base salary through the date of termination at the rate then in effect, plus all other amounts under any compensation plan or practice of Oncternal to which he is entitled; (2) 6 months of base salary continuation payments, generally payable in accordance with Oncternal's usual payroll practices (which amount will be increased to 12 months in the event such termination occurs following a change in control and shall be paid in a lump sum instead of in installments); and (3) continuation of health benefits at Oncternal's expense for a maximum of the duration of the severance period.

Dr. Breitmeyer's employment offer letter also provides for certain accelerated vesting of his outstanding stock awards (other than the restricted stock granted to him in February 2016, the accelerated vesting of which is governed by the terms of that award agreement). Specifically, if Oncternal terminates Dr. Breitmeyer's employment without cause or if he resigns for good reason, in either case within 90 days prior to or at any time following a change in control, he will be entitled to the automatic acceleration of the vesting and exercisability of his stock options, restricted stock and such other awards (other than any restricted stock issued to him in February 2016). In addition, all of his stock options, restricted stock and such other awards (including any restricted stock issued to him in February 2016) will vest in the event of his termination of employment by reason of his death or disability. Finally, 50% of all of his stock options, restricted stock and such other awards (including any restricted stock issued to him in February 2016) will vest upon the occurrence of a change in control (as defined in the Oncternal 2015 Plan and described below). In addition, all of his restricted stock issued to him in February 2016 will vest in the event of his termination without cause or resignation for good reason following a change in control (and the terms "cause," "good reason" and "change in control" have substantially the same definitions as given to such terms in his employment offer letter and described below).

The severance benefits prescribed by Dr. Breitmeyer's employment offer letter are subject to a Section 280G better-off cutback provision, which provides that, in the event that the benefits provided to him pursuant to the employment offer letter or otherwise constitute parachute payments with the meaning of Section 280G of the Code, the severance benefits will either be delivered in full or reduced to the extent necessary to avoid an excise tax under Section 4999 of the Code, whichever would result in him receiving the largest amount of severance benefits on an after-tax basis.

Employment Offer Letter with Richard G. Vincent

In January 2019, Oncternal entered into an employment offer letter with Richard G. Vincent, Oncternal's Chief Financial Officer. Mr. Vincent has agreed to devote 80% of his working time and attention to the business affairs of Oncternal. Mr. Vincent is currently entitled to an annual base salary of $300,000 and a target annual bonus in an amount to be determined by the Oncternal Board.

Mr. Vincent's employment offer letter provides for severance benefits upon a qualifying termination of employment, including modified severance benefits on a qualifying termination of employment following a change in control (each as defined below). If Oncternal terminates Mr. Vincent's employment without cause (as

defined below) or if he resigns for good reason (as defined below), he is entitled to the following payments and benefits, subject to a release of claims in favor of Oncternal: (1) his fully earned but unpaid base salary through the date of termination at the rate then in effect, plus all other amounts under any compensation plan or practice of Oncternal to which he is entitled; (2) 6 months of base salary continuation payments, generally payable in accordance with Oncternal's usual payroll practices (which amount will be increased to 12 months in the event such termination occurs following a change in control (as defined in the Oncternal 2015 Plan and described below) and shall be paid in a lump sum instead of in installments); and (3) continuation of health benefits at Oncternal's expense for a maximum of the duration of the severance period.

Mr. Vincent's employment offer letter also provides for certain accelerated vesting of his outstanding stock awards. Specifically, if Oncternal terminates Mr. Vincent's employment without cause or if he resigns for good reason, in either case within 90 days prior to or at any time following a change in control, he will be entitled to the automatic acceleration of the vesting and exercisability of his stock options, restricted stock and such other awards. In addition, all of his stock options, restricted stock and such other awards will vest in the event of his termination of employment by reason of his death or disability. Finally, 50% of all of his stock options, restricted stock and such other awards will vest upon the occurrence of a change in control.

The severance benefits prescribed by Mr. Vincent's employment offer letter are subject to a Section 280G better-off cutback provision, which provides that, in the event that the benefits provided to him pursuant to the employment offer letter or otherwise constitute parachute payments with the meaning of Section 280G of the Code, the severance benefits will either be delivered in full or reduced to the extent necessary to avoid an excise tax under Section 4999 of the Code, whichever would result in him receiving the largest amount of severance benefits on an after-tax basis.

Consulting Agreement with Richard Vincent

Prior to his commencement of employment in January 2019, Mr. Vincent provided services to Oncternal as its Chief Financial Officer pursuant to a consulting agreement that Oncternal executed with Mr. Vincent in April 2017. Pursuant to the consulting agreement, Oncternal paid Mr. Vincent at the rate of $12,000 per month for his services for up to eight days per month, plus a $200 per hour retainer for any hours in excess of that commitment. Oncternal also provided Mr. Vincent with reimbursement for reasonable business expenses in connection with his services. The consulting agreement was terminated upon his conversion to employment on January 1, 2019.

Employment Offer Letter with Hazel Aker

In March 2019, Oncternal entered into an employment offer letter with Hazel Aker, Oncternal's General Counsel. Ms. Aker has agreed to devote half of her working time and attention to the business affairs of Oncternal. Ms. Aker is currently entitled to an annual base salary of $150,000 and a target annual bonus in an amount to be determined by the Oncternal Board.

Defined Terms Applicable to Executive Employment Offer Letters

For purposes of the executive employment offer letters, "cause" generally means an executive officer's (a) unauthorized use or disclosure of confidential information or trade secrets of Oncternal or any material breach of a written agreement between executive and Oncternal, including without limitation a material breach of any employment, consulting, confidentiality, non-compete, non-solicit or similar agreement; (b) the executive's commission of, indictment for of the entry of a pleas of guilty or *nolo contendere* to, a felony under the laws of the United States; (c) the executive's gross negligence or willful misconduct or executive's willful or repeated failure or refusal to substantially perform assigned duties; or (d) any act of fraud, embezzlement, material misappropriation or dishonesty committed by the executive against Oncternal.

For purposes of the executive employment offer letters, "good reason" generally means the occurrence of any of the following events without executive's consent: (a) a change in the executive's position with Oncternal (or its

subsidiary employing executive) that materially reduces the executive's authority, duties or responsibilities; (b) a material diminution in the level of the executive's base compensation, except in connection with a general reduction in the base compensation of Oncternal's personnel of similar status and responsibilities; (c) a relocation of the executive's place of employment by more than 50 miles, provided that such change, reduction or relocation is effected by Oncternal (or its subsidiary employing executive) without the executive's consent; (d) any material breach by Oncternal of its obligations to the executive under the executive's employment offer letter with Oncternal. Notwithstanding the foregoing, good reason shall only exist if the executive has provided Oncternal with written notice within 60 days of the initial occurrence of any of the foregoing events or conditions, and Oncternal or any successor or affiliate fails to eliminate the conditions constituting good reason within 30 days after receipt of written notice of such event or condition from the executive. An executive's resignation from employment with Oncternal for good reason must occur within six months following the initial occurrence of one of the foregoing events or conditions.

For purposes of the executive employment offer letters, "change in control" generally means (i) a merger or consolidation of Oncternal with or into any other corporation or other entity or person, (ii) a sale, lease, exchange or other transfer in one transaction or a series of related transactions of all or substantially all of Oncternal's assets, or (iii) any other transaction, including the sale by Oncternal of new shares of its capital stock or a transfer of existing shares of capital stock of Oncternal, the result of which is that a third-party that is not an affiliate of Oncternal or its stockholders (or a group of third parties not affiliated with Oncternal or its stockholders) immediately prior to such transaction acquires or holds capital stock of Oncternal representing a majority of Oncternal's outstanding voting power immediately following such transaction; provided that the following events shall not constitute a change in control: (A) a transaction (other than a sale of all or substantially all of Oncternal's assets) in which the holders of the voting securities of Oncternal immediately prior to the merger or consolidation hold, directly or indirectly, at least a majority of the voting securities in the successor corporation or its parent immediately after the merger or consolidation; (B) a sale, lease, exchange or other transaction in one transaction or a series of related transactions of all or substantially all of Oncternal's assets to an affiliate of Oncternal; (C) an initial public offering of any of Oncternal's securities; (D) a reincorporation of Oncternal solely to change its jurisdiction; or (E) a transaction undertaken for the primary purpose of creating a holding company that will be owned in substantially the same proportion by the persons who held Oncternal's securities immediately before such transaction. The merger will not constitute a change in control of Oncternal for these purposes.

Oncternal 2015 Equity Incentive Plan

The Oncternal Board and the stockholders of Oncternal approved the Oncternal Therapeutics, Inc. 2015 Equity Incentive Plan (the "Oncternal 2015 Plan"), in July 2015. The Oncternal 2015 Plan was further amended in May 2016 and September 2018, both of which amendments where approved by both the Oncternal Board and the stockholders of Oncternal.

Pursuant to the Merger Agreement, at the Effective Time, each outstanding and unexercised option to purchase shares of Oncternal common stock issued under the Oncternal 2015 Plan will be assumed by GTx, and become an option to purchase that number of shares of GTx common stock equal to the product obtained by multiplying (i) the number of shares of Oncternal common stock that were subject to such option immediately prior to the Effective Time by (ii) the exchange ratio, rounded down to the nearest whole share. The per share exercise price for shares of GTx common stock issuable upon exercise of each Oncternal option assumed by GTx shall be determined by dividing (a) the per share exercise price of Oncternal common stock subject to such Oncternal option, as in effect immediately prior to the Effective Time, by (b) the exchange ratio, rounded up to the nearest whole cent. Following the Effective Time, the combined organization intends to terminate the Oncternal 2015 Plan and, accordingly, no shares will be available for future issuance under the Oncternal 2015 Plan following the Effective Time. Notwithstanding the foregoing, the Oncternal 2015 Plan will continue to govern outstanding awards granted thereunder. As of March 31, 2019, a total of 8,600,000 shares were reserved for issuance under the Oncternal 2015 Plan and awards covering 6,843,251 shares of Oncternal common stock remained outstanding under the Oncternal 2015 Plan.

The following is only a summary of the material terms of the Oncternal 2015 Plan, is not a complete description of all provisions of the Oncternal 2015 Plan and should be read in conjunction with the Oncternal 2015 Plan, which is filed as an exhibit to the registration statement on Form S-4 of which this proxy statement/prospectus/information statement forms a part.

Administration. The Oncternal Board administers the Oncternal 2015 Plan. Subject to the terms and conditions of the Oncternal 2015 Plan, the administrator has the authority to select the persons to whom awards are to be made, to determine the type or types of awards to be granted to each person, determine the number of awards to grant, determine the number of shares to be subject to such awards, and the terms and conditions of such awards, and make all other determinations and decisions and to take all other actions necessary or advisable for the administration of the Oncternal 2015 Plan. The plan administrator is also authorized to establish, adopt, amend or revise rules relating to administration of the Oncternal 2015 Plan, subject to certain restrictions.

Eligibility. Options, restricted stock, restricted stock units and other awards under the Oncternal 2015 Plan were able to be granted to individuals who were Oncternal's employees, consultants and members of the Oncternal Board at the time of grant. Only employees were eligible to be granted incentive stock options.

Awards. The Oncternal 2015 Plan provides that the administrator may grant or issue stock options, restricted stock, restricted stock units, other stock-based awards, or any combination thereof. Each award is set forth in a separate agreement with the person receiving the award and indicates the type, terms and conditions of the award.

- Non-Qualified Stock Option. NQSOs provide for the right to purchase shares of Oncternal common stock at a specified price which may not be less than the fair market value of a share of stock on the date of grant, and usually will become exercisable in one or more installments after the grant date, subject to the participant's continued employment or service with Oncternal and/or subject to the satisfaction of performance targets established by the plan administrator. NQSOs may be granted for any term specified by the plan administrator, but the term may not exceed ten years.
- Incentive Stock Option. Incentive stock options, or ISOs, are designed to comply with the provisions of the Code and are subject to specified restrictions contained in the Internal Revenue Code applicable to ISOs. Among such restrictions, ISOs must have an exercise price of not less than the fair market value of a share of common stock on the date of grant, may only be granted to employees, must expire within a specified period of time following the optionee's termination of employment, and must be exercised within the ten years after the date of grant. In the case of an ISO granted to an individual who owns (or is deemed to own) more than 10% of the total combined voting power of all classes of Oncternal capital stock on the date of grant, the Oncternal 2015 Plan provides that the exercise price must be at least 110% of the fair market value of a share of common stock on the date of grant and the ISO must expire on the fifth anniversary of the date of its grant.
- Restricted Stock. Restricted stock may be granted to participants and made subject to such restrictions as may be determined by the administrator. Typically, restricted stock may be repurchased by Oncternal at the original purchase price or, if no cash consideration was paid for such stock, forfeited for no consideration if the conditions or restrictions are not met, and the restricted stock may not be sold or otherwise transferred to third parties until restrictions are removed or expire. Recipients of restricted stock, unlike recipients of options, may have voting rights and may receive dividends, if any, prior to when the restrictions lapse.
- Restricted Stock Units. Restricted stock units may be awarded to participants, typically without payment of consideration or for a nominal purchase price, but subject to vesting conditions including continued employment or performance criteria established by the administrator. Like restricted stock, restricted stock units may not be sold or otherwise transferred or hypothecated until vesting conditions are removed or expire. Unlike restricted stock, stock underlying restricted stock units will not be issued until sometime after the restricted stock units have vested, and recipients of restricted stock units

generally will have no voting or dividend rights prior to the time when vesting conditions are satisfied and the shares have been issued.

- Other Stock-Based Awards. Other stock-based awards may entitle participants to receive shares of Oncternal common stock in the future. Other stock-based awards may also be a form of payment in the settlement of other awards granted under the Oncternal 2015 Plan, as stand-alone payments and/or as payment in lieu of compensation to which a participant is otherwise entitled. Other stock-based awards may be paid in shares of Oncternal common stock, cash or other property, as the plan administrator shall determine.

Corporate Transactions. In the event of a change of control where the acquirer does not assume awards granted under the Oncternal 2015 Plan, awards issued under the Oncternal 2015 Plan will be subject to accelerated vesting such that 100% of the awards will become vested and exercisable or payable, as applicable, immediately prior to the change in control. Under the Oncternal 2015 Plan, a change of control is generally defined as:

- a merger or consolidation of the company with or into any other corporation or other entity or person;
- a sale, lease, exchange or other transfer in one transaction or a series of related transactions of all or substantially all of the Company's assets; or
- any other transaction, including the sale by Oncternal of new shares of Oncternal capital stock or a transfer of existing shares of Oncternal's capital stock, the result of which is that a third-party that is not an affiliate of Oncternal or its shareholders (or a group of third parties not affiliated with Oncternal or its shareholders) immediately prior to such transaction acquires or holds capital stock representing a majority of Oncternal's outstanding voting power immediately following such transaction;

provided that the following events shall not constitute a "change in control" under the Oncternal 2015 Plan:

- a transaction (other than a sale of all or substantially all of Oncternal's assets) in which the holders of Oncternal's voting securities immediately prior to the merger or consolidation hold, directly or indirectly, at least a majority of the voting securities in the successor corporation or its parent immediately after the merger or consolidation;
- a sale, lease, exchange or other transaction in one transaction or a series of related transactions of all or substantially all of Oncternal's assets to an affiliate of Oncternal;
- an initial public offering of any of Oncternal's securities;
- a reincorporation solely to change Oncternal's jurisdiction; or
- a transaction undertaken for the primary purpose of creating a holding company that will be owned in substantially the same proportion by the persons who held Oncternal's securities immediately before such transaction.

The merger will not constitute a change in control of Oncternal for these purposes.

Amendment and Termination of the Oncternal 2015 Plan. The Oncternal Board may amend or modify the Oncternal 2015 Plan. However, stockholder approval of any amendment to the Oncternal 2015 Plan must be obtained to the extent necessary and desirable to comply with any applicable law, regulation or stock exchange rule. The administrator may, with the consent of the affected option holders, cancel any or all outstanding awards under the Oncternal 2015 Plan and grant new awards in substitution. Following the closing of the merger, no additional awards will be granted under the Oncternal 2015 Plan.

Oncternal Director Compensation

For the fiscal year ended December 31, 2018, Oncternal did not have a formal director compensation policy in place. Only David Hale and Charles Theuer received any compensation during 2018 for their service as Oncternal non-employee directors.

In May 2018, in connection with his commencement of service on the Oncternal Board, Charles Theuer, M.D., Ph.D. received 200,000 shares of restricted stock, which shares will vest over four years, with 25% vesting on the first anniversary of the date of grant, and the remaining shares vesting in equal monthly installments over the thirty-six months thereafter, subject to Dr. Theuer's continued service as a member of the Oncternal Board on each such vesting date.

Effective December 1, 2018, the Oncternal Board approved a compensation arrangement with David Hale pursuant to which he will receive a cash retainer of $12,000 per month for his service as non-executive Chairman of the Board.

Following completion of the merger, it is expected that the combined organization will provide compensation to non-employee directors. GTx's current director compensation program will be suspended at the time of the closing of the merger and the director compensation policies for the combined organization following the merger will be re-evaluated by the compensation committee and board of directors of the combined organization following completion of the merger and may be subject to change. Non-employee directors of the combined organization are, however, expected to receive annual cash retainers and equity compensation, although the amount of such compensation has not yet been determined.

The table below represents the compensation earned by Oncternal's non-employee directors who served on the Oncternal Board during 2018 who will also serve as directors of the combined organization following the merger. Dr. Breitmeyer is not listed in the following table since he served as an employee of Oncternal during 2018 as well as a member of the Oncternal Board and did not receive any additional compensation for serving as a member of the Oncternal Board. Dr. Breitmeyer's compensation is described under "*Executive Compensation of the Executive Officers of the Combined Organization*" above.

ONCTERNAL DIRECTOR COMPENSATION—FISCAL 2018

Name	Fees Earned or Paid in Cash ($)	Stock Awards ($)(1)	Total ($)
Scott Glenn	—	—	—
David F. Hale	12,000	—	12,000
William R. LaRue	—	—	—
Yanjun Liu	—	—	—
Xin Nakanishi	—	—	—
Charles Theuer, M.D., Ph.D.	—	10,000	10,000

(1) The amounts in this column represent the aggregate grant date fair value of the stock awards granted to Dr. Theuer during the year ended December 31, 2018 as computed in accordance with FASB ASC Topic 718. Assumptions used in computing the aggregate grant date fair value in accordance with FASB ASC Topic 718 are set forth in Note 5 to the Oncternal financial statements included elsewhere in this proxy statement/prospectus/information statement. As of December 31, 2018, Mr. LaRue held 165,000 shares of unvested Oncternal restricted stock and Dr. Theuer held 200,000 restricted shares of Oncternal common stock. None of the other Oncternal non-employee directors listed in the table above held any unvested equity awards as of December 31, 2018.

RELATED PARTY TRANSACTIONS OF DIRECTORS AND EXECUTIVE OFFICERS OF THE COMBINED ORGANIZATION

Described below are any transactions occurring since January 1, 2017 and any currently proposed transactions to which either GTx or Oncternal was a party and in which

- the lesser of $120,000 or 1% of the average of the total assets at year-end for the last two completed fiscal years; and
- a director, executive officer, holder of more than 5% of the outstanding capital stock of GTx or Oncternal, or any member of such person's immediate family had or will have a direct or indirect material interest.

GTx Transactions

Policies and Procedures for Review of Related Party Transactions

The GTx Board adopted a related party transactions policy, which specifies GTx's policies and procedures regarding transactions between GTx and its employees, officers, directors or their family members. GTx's Chief Legal Officer is responsible for (a) ensuring that policy is distributed to all GTx officers, directors and other managers and (b) requiring that any proposed related party transaction be presented to the GTx Audit Committee for consideration before GTx enters into any such transactions. This policy can be found on GTx's website (www.gtxinc.com) under "Investors" at "Corporate Governance."

It is the policy of GTx to prohibit all related party transactions unless GTx Audit Committee determines in advance of GTx entering into any such transaction that there is a compelling business reason to enter into such a transaction. There is a general presumption that GTx Audit Committee will not approve a related party transaction with GTx. However, GTx Audit Committee may approve a related party transaction if:

- it finds that there is a compelling business reason to approve the transaction, taking into account such factors as the absence of other unrelated parties to perform similar work for a similar price within a similar timeframe; and
- it finds that it has been fully apprised of all significant conflicts that may exist or otherwise arise on account of the transaction, and it believes, nonetheless, that GTx is warranted entering into the related party transaction and has developed an appropriate plan to manage the potential conflicts of interest.

Certain Transactions with or Involving Related Persons

Except where specifically noted, the following information and all other information contained in this proxy statement/prospectus/information statement do not give effect to the GTx Reverse Stock Split.

Employment Arrangements. For information on employment arrangements and compensation for service on the board of directors of GTx, see "GTx Executive Compensation" and "GTx Director Compensation—Fiscal 2018" above.

Warrant Exercises. On November 14, 2014, GTx issued warrants (the "BVF Warrants"), to Biotechnology Value Fund, L.P., Biotechnology Value Fund II, L.P., Investment 10, L.L.C. and MSI BVF SPV, LLC, or collectively, the BVF Entities, to purchase an aggregate of 1,111,081 (whole) shares of GTx common stock (as adjusted to give effect to the 2016 Reverse Stock Split) at an exercise price of $8.50 per share (as adjusted to give effect to the 2016 Reverse Stock Split) in connection with a private placement of our common stock and warrants to purchase common stock. On March 13, 2018, the BVF Entities exercised the BVF Warrants in full pursuant to the "net exercise" provisions of the BVF Warrants resulting in a net issuance on exercise to the BVF Entities of an aggregate of 674,579 shares of GTx common stock. Based solely on the difference between the fair market

value of GTx common stock on the date of exercise as determined pursuant to the net exercise provisions of the BVF Warrants and the exercise price of the BVF Warrants, the value realized by the BVF Entities upon exercise of the BVF Warrants totaled approximately $14.6 million. GTx's involvement in the BVF Warrant exercises did not require approval under its related party transactions policy because GTx's actions with respect to such matters were undertaken in accordance with its pre-existing obligations under the BVF Warrants.

Loan Agreement. On August 10, 2017, GTx entered into a loan agreement with J.R. Hyde, III and The Pyramid Peak Foundation to borrow up to a total of $15,000,000. Each of Mr. Hyde and The Pyramid Peak Foundation are significant stockholders, and Mr. Hyde serves on the GTx Board. GTx did not borrow any amounts under the loan agreement and the loan agreement terminated in accordance with its terms on September 29, 2017 in connection with the completion of the September 2017 private placement of GTx equity securities described below.

September 2017 Private Placement and Related Registration. On September 29, 2017, GTx completed a private placement of an aggregate of 5,483,320 immediately separable units, comprised of an aggregate of 5,483,320 shares of GTx common stock and warrants to purchase up to an aggregate of 3,289,988 additional shares of GTx common stock, for an aggregate purchase price of approximately $48.5 million. The per unit purchase price for a share of common stock and a warrant to purchase 0.6 of a share of common stock was $8.845. The warrants, which have a five-year term expiring on September 29, 2022, are immediately exercisable and have a per share exercise price of $9.02. Pursuant to the terms of the securities purchase agreement, GTx filed a registration statement with the SEC in November 2017 to register the resale of the shares of GTx common stock and the shares of common stock underlying the warrants, and agreed to keep one or more registration statements registering the shares effective until the earlier to occur of September 28, 2019 or the date on which all of the applicable shares of GTx common stock have been sold or can be sold publicly without restriction or limitation under Rule 144 under the Securities Act. GTx's total expenses in connection with the filing of the November 2017 registration statement were approximately $70,000. The investors in the private placement included the following related parties:

Investor	Shares Purchased	Warrants Purchased	Aggregate Unit Purchase Price ($)
J.R. Hyde III(1)	1,130,582	678,349	9,999,997.79
The Pyramid Peak Foundation(1)	565,291	339,174	4,999,998.90
Jack W. Schuler(1)	226,116	135,669	1,999,996.02
Amzak Health Investors, LLC(2)(3)	847,936	508,761	7,499,993.92
Aisling Capital IV LP(2)	847,936	508,761	7,499,993.92
Boxer Capital, LLC	565,291	339,174	4,999,998.90

(1) Executive officer, director and/or greater than 5% stockholder (and a "related party") of GTx immediately prior to the private placement. Mr. Schuler is no longer a stockholder of record of our capital stock.
(2) Became a greater than 5% stockholder of GTx as a result of the private placement and, accordingly, became a "related party" of GTx. Amzak Health Investors, LLC and Aisling Capital IV LP are no longer stockholders of record of our capital stock.
(3) Pursuant to the terms of the securities purchase agreement, GTx reimbursed Amzak Health Investors for its legal fees in the amount of $33,078.

The GTx Board appointed a "Special Committee" of the board of directors consisting of disinterested and independent directors to review and evaluate the private placement and any other alternative transaction to the private placement, and delegated to the Special Committee the exclusive power and authority to consider, negotiate, disapprove or approve the private placement, which the Special Committee ultimately determined to approve. Likewise, as a result of the participation of related parties in the private placement, the private placement was reviewed and pre-approved by the Audit Committee in accordance with GTx's related party transactions policy.

Indemnity Agreements

GTx has entered into indemnity agreements with each of its current directors and certain of its executive officers to give such directors and officers additional contractual assurances regarding the scope of the indemnification set forth in GTx's charter and bylaws and to provide additional procedural protections.

Oncternal Transactions

Affiliations with Principal Stockholders

Yanjun Liu, M.D., Ph.D. and Xin Nakanishi, Ph.D. are members of the Oncternal Board and are affiliated with SPH. SPH USA is the wholly-owned subsidiary of SPH. and holds more than 5% of Oncternal's outstanding capital stock. For more information see the section entitled "Principal Shareholders of Oncternal" of this proxy statement/prospectus/information statement.

Cooper Collins is a member of the Oncternal Board and the manager of MagnaSci GP and MagnaSci Co-Investments. MagnaSci GP and MagnaSci Co-Investments and their affiliates holds more than 5% of Oncternal's outstanding capital stock. For more information see the section entitled "Principal Shareholders of Oncternal" of this proxy statement/prospectus/information statement.

SPH USA License Agreement

In November 2018, Oncternal entered into a license and development agreement the ("SPH USA License Agreement") with SPH USA, under which Oncternal granted rights to manufacture, develop, market, distribute and sell in the People's Republic of China, Hong Kong, Macau, and Taiwan Oncternal's product candidates under the Georgetown License Agreement and the Regents License Agreement. For more information see the section entitled "Oncternal Business—Licenses and Collaborative Relationships" of this proxy statement/prospectus/information statement.

Voting Agreements

In connection with the issuance of Oncternal's Series C preferred stock in November 2018, Oncternal entered into an amended and restated voting agreement with certain directors, executive officers and stockholders, and their affiliates. As a condition to the closing of the merger, the amended and voting agreement must be terminated prior to the Effective Time.

Oncternal has also entered into voting agreements in connection with the merger with certain directors, executive officers and stockholders, and their affiliates. SPH USA, which holds 100% of the outstanding Series C preferred stock and which represents approximately 20.9% of the outstanding shares of Oncternal capital stock on as converted common stock basis, has not executed a voting agreement. For a description of these voting agreements, please see the section entitled "Agreements Related to the Merger—Voting Agreements" of this proxy statement/prospectus/information statement.

Investors' Rights Agreement

In connection with the issuance of Oncternal's Series C preferred stock in November 2018, Oncternal entered into an amended and restated investors' rights agreement, including with certain directors, executive officers and stockholders, and their affiliates, which provides that certain holders of common stock (including those issuable upon conversion of Oncternal preferred stock and capital stock underlying warrants) have certain rights relating to the registration of shares of such common stock.

In addition to such registration rights, the amended and restated investors' rights agreement provides for certain information rights and pre-emptive rights. As a condition to the closing of the merger, the amended and restated investors' rights agreement must be terminated prior to the Effective Time.

Co-Sale Agreement

In connection with the issuance of Oncternal's Series C preferred stock in November 2018, Oncternal entered into an amended and restated co-sale agreement, including with certain directors, executive officers and stockholders, and their affiliates. As a condition to the closing of the merger, the amended and restated right of first refusal and co-sale agreement must be terminated prior to the Effective Time.

Indemnification Agreements

Oncternal has entered into indemnification agreements with each of its officers and directors and purchased directors' and officers' liability insurance. The indemnification agreements and bylaws of Oncternal require Oncternal to indemnify its directors and officers to the fullest extent permitted under Delaware law.

Series C Financing

In November 2018, Oncternal issued and sold in a closing an aggregate of 34,000,000 shares of series C preferred stock at a price per share of $0.50 for aggregate consideration of approximately $17.0 million to SPH USA. It is a condition to the completion of the merger that each outstanding share of Oncternal's series C preferred stock will convert into one share of Oncternal common stock.

Compensation of Mary Breitmeyer

Mary Breitmeyer, who is Dr. Breitmeyer's spouse, is a part-time employee of Oncternal. Ms. Breitmeyer receives compensation for her services as an employee. Ms. Breitmeyer's current base salary is $74,675 per year. During 2018, Ms. Breitmeyer received total cash compensation of $72,500 from Oncternal.

Policy for Approval of Related Person Transactions

While Oncternal does not have a formal written policy or procedure for the review, approval or ratification of related party transactions, the Oncternal Board reviews and considers the interests of its directors, executive officers and principal stockholders in its review and consideration of transactions and obtains the approval of non-interested directors when it determines that such approval is appropriate under the circumstances.

UNAUDITED PRO FORMA CONDENSED COMBINED FINANCIAL INFORMATION

The unaudited pro forma net loss and book value per share does not give effect to the GTx Reverse Stock Split described in Proposal No. 2 in this proxy statement/prospectus/information statement.

The following unaudited pro forma condensed combined financial information was prepared using the acquisition method of accounting under U.S. GAAP. For accounting purposes, Oncternal is considered to be acquiring GTx and the merger is expected to be accounted for as an asset acquisition. Oncternal is considered the accounting acquirer even though GTx will be the issuer of the common stock in the merger. To determine the accounting for this transaction under U.S. GAAP, a company must assess whether an integrated set of assets and activities should be accounted for as an acquisition of a business or an asset acquisition. The guidance requires an initial screen test to determine if substantially all of the fair value of the gross assets acquired is concentrated in a single asset or group of similar assets. If that screen is met, the set is not a business. In connection with the acquisition of GTx, substantially all the fair value is included in in-process research and development ("IPR&D") and, as such, the acquisition is expected to be treated as an asset acquisition.

The unaudited pro forma combined balance sheet data assume that the merger took place on December 31, 2018, and combines the historical balance sheets of GTx and Oncternal as of such date. The unaudited pro forma condensed combined statement of operations data assume that the merger took place as of January 1, 2018, and combines the historical results of GTx and Oncternal for the year ended December 31, 2018. The unaudited pro forma condensed combined financial information was prepared in accordance with U.S. GAAP and pursuant to the rules and regulations of Article 11 of SEC Regulation S-X. The historical financial statements of GTx and Oncternal have been adjusted to give pro forma effect to events that are (i) directly attributable to the transaction, (ii) factually supportable, and (iii) with respect to the unaudited pro forma condensed combined statement of operations, expected to have a continuing impact on the combined company's results.

GTx's assets and liabilities will be measured and recognized at their relative fair values allocation as of the transaction date with any value associated with IPR&D being expensed as there is no alternative future use, and combined with the assets, liabilities and results of operations of Oncternal after the consummation of the merger.

The unaudited pro forma condensed combined financial information is based on the assumptions and adjustments that are described in the accompanying notes. The accounting for the transaction as an asset acquisition is dependent upon the valuation of the IPR&D, which has yet to be completed. Accordingly, the pro forma adjustments are preliminary, subject to further revision as additional information becomes available and additional analyses are performed, and have been made solely for the purpose of providing unaudited pro forma condensed combined financial information. Differences between these preliminary estimates and the final accounting, expected to be completed after the closing of the merger, will occur and these differences could have a material impact on the accompanying unaudited pro forma condensed combined financial information and the combined company's future results of operations and financial position. In addition, differences between the preliminary and final amounts will likely occur as a result of the amount of cash used for GTx's operations, changes in the fair value of GTx common stock, and other changes in GTx's assets and liabilities.

The unaudited pro forma condensed combined financial information does not give effect to the potential impact of current financial conditions, regulatory matters, operating efficiencies or other savings or expenses that may be associated with the integration of the two companies. The unaudited pro forma condensed combined financial information is preliminary and has been prepared for illustrative purposes only and is not necessarily indicative of the financial position or results of operations in future periods or the results that actually would have been realized had GTx and Oncternal been a combined company during the specified periods. The actual results reported in periods following the merger may differ significantly from those reflected in the unaudited pro forma condensed combined financial information presented herein for a number of reasons, including, but not limited to, differences in the assumptions used to prepare this pro forma financial information.

The unaudited pro forma condensed combined financial information, including the notes thereto, should be read in conjunction with the separate historical financial statements of GTx and Oncternal, and their respective management's discussion and analysis of financial condition and results of operations included elsewhere in this proxy statement/prospectus/information statement. GTx' historical audited financial statements for the years ended December 31, 2018 and 2017 are derived from GTx's Annual Report on Form 10-K for the year ended December 31, 2018.

Accounting rules require evaluation of certain assumptions, estimates, or determination of financial statement classifications which are completed during the measurement period as defined in current accounting standards. The accounting policies of GTx may materially vary from those of Oncternal. During preparation of the unaudited pro forma condensed combined financial information, management has performed a preliminary analysis and is not aware of any material differences, and accordingly, this unaudited pro forma condensed combined financial information assumes no material differences in accounting policies. Following the acquisition, management will conduct a final review of GTx's accounting policies in order to determine if differences in accounting policies require adjustment or reclassification of GTx's results of operations or reclassification of assets or liabilities to conform to Oncternal' accounting policies and classifications. As a result of this review, management may identify differences that, when conformed, could have a material impact on these unaudited pro forma condensed combined financial statements.

Unaudited Pro Forma Condensed Combined Balance Sheet
December 31, 2018
(in thousands)

	GTx	Oncternal	Pro Forma Adjustments	Notes	Pro Forma Combined
Assets					
Current assets					
Cash, cash equivalents and short-term investments	$ 28,458	$ 20,645	$ (9,077)	D	$ 40,026
Prepaid expenses and other current assets	2,750	565	—		3,315
Total current assets	31,208	21,210	(9,077)		43,341
Property and equipment, net	19	—	—		19
Other	94	752	—		846
Total assets	$ 31,321	$ 21,962	$ (9,077)		$ 44,206
Liabilities, convertible preferred stock, and stockholders' equity (deficit)					
Current liabilities					
Accounts payable	$ 3,279	$ 3,440	$ —		$ 6,719
Accrued and other current liabilities	1,931	891	(218)	D	2,604
Total current liabilities	5,210	4,331	(218)		9,323
Warrant liability	—	674	(674)	C	—
Convertible preferred stock	—	46,588	(46,588)	C	—
Stockholders' equity (deficit):					
Common stock	24	5	68	A,B,C	97
Additional paid-in capital	626,142	1,748	(543,766)	F,G	84,124
Accumulated deficit	(600,055)	(31,384)	582,101	F,H	(49,338)
Total stockholders' equity (deficit)	26,111	(29,631)	38,403		34,883
Total liabilities, convertible preferred stock and stockholders' equity (deficit)	$ 31,321	$ 21,962	$ (9,077)		$ 44,206

Unaudited Pro Forma Condensed Combined Statement of Operations
For the Year Ended December 31, 2018
(in thousands, except share and per share data)

	GTx	Oncternal	Pro Forma Adjustments	Notes	Pro Forma Combined
Grant revenue	$ —	$ 2,521	$ —		$ 2,521
Operating expenses:					
Research and development	29,669	8,287	—		37,956
General and administrative	9,390	1,820	(218)	D	10,992
Total operating expenses	39,059	10,107	(218)		48,948
Loss from operations	(39,059)	(7,586)	218		(46,427)
Change in fair value of warrant liability	—	713	(713)	E	—
Interest and other income, net	641	294	—		935
Net loss	$ (38,418)	$ (6,579)	$ (495)		$ (45,492)
Net loss per share, basic and diluted	$ (1.65)	$ (0.13)	$ —		$ (0.56)
Weighted-average shares of common stock outstanding, basic and diluted	23,346,231	48,930,354	57,562,134	I	80,908,365

Notes to the Unaudited Pro Forma Condensed Combined Financial Information

1. Description of Transaction

On March 6, 2019, GTx entered into the merger agreement with Oncternal and Merger Sub pursuant to which Merger Sub will merge with and into Oncternal, with Oncternal surviving the merger as a wholly-owned subsidiary of GTx. The transaction is expected to be accounted for as a reverse asset acquisition by Oncternal. To determine the accounting for this transaction under U.S. GAAP, a company must assess whether an integrated set of assets and activities should be accounted for as an acquisition of a business or an asset acquisition. The guidance requires an initial screen test to determine if substantially all of the fair value of the gross assets acquired is concentrated in a single asset or group of similar assets. If that screen is met, the set is not a business. In connection with the acquisition of GTx, substantially all the fair value is included in IPR&D and, as such, the acquisition is expected to be treated as an asset acquisition. GTx's assets and liabilities will be measured and recognized at their relative fair values allocation as of the transaction date with any value associated with IPR&D being expensed as there is no alternative future use, and combined with the assets, liabilities and results of operations of Oncternal after the consummation of the merger. The reported consolidated financial condition and results of operations of Oncternal after completion of the merger will reflect these fair values.

Subject to the terms and conditions of the merger agreement, at the effective time of the merger: (i) each share of Oncternal common stock outstanding immediately prior to the effective time will be converted solely into the right to receive a number of shares of GTx's common stock (the "Shares") equal to the exchange ratio described below, (ii) each outstanding Oncternal stock option will be assumed by GTx, and (iii) each outstanding Oncternal warrant will be assumed by GTx.

Under the exchange ratio formula in the merger agreement, the former Oncternal stockholders immediately before the merger are expected to own approximately 75% of the outstanding capital stock of GTx, and the stockholders of GTx immediately before the merger are expected to own approximately 25% of the outstanding capital stock of GTx, subject to certain assumptions. The exchange ratio formula excludes Oncternal's outstanding stock options and warrants and GTx's outstanding stock options and warrants. To the extent Oncternal's outstanding stock options or warrants are exercised in the future, it will result in further dilution to GTx's stockholders. Under certain circumstances, the ownership percentages may be adjusted upward or downward based on cash levels of the respective companies at the closing of the merger.

Under the terms and subject to the conditions of the Merger Agreement, each share of Oncternal outstanding common or preferred stock will be converted into the right to receive approximately 0.45 shares of GTx common stock. Oncternal estimates that the aggregate value of the consideration to be paid in the merger will be approximately $29.2 million, excluding transaction costs. The number and value of the shares of GTx common stock to be issued pursuant to the merger will not be determined until the completion of the merger and therefore, the final aggregate value of the consideration paid in the merger may be more or less than $29.2 million.

The merger is subject to customary closing conditions, including the adoption of the merger agreement by GTx and Oncternal stockholders. Subject to these conditions, the merger is expected to close in the second quarter of 2019. During the year ended December 31, 2018, there were no material transactions between Oncternal and its subsidiary.

At the closing of the merger, GTx, Marc Hanover, as representative of the GTx stockholders prior to such closing, and Computershare Inc., as the Rights Agent, will enter into a Contingent Value Rights Agreement (the "CVR Agreement"). Pursuant to the CVR Agreement, for each share of GTx common stock held, GTx stockholders of record as of immediately prior to the closing will receive one contingent value right ("CVR") entitling such holders to receive in the aggregate 50% of any net proceeds received during the 15-year period after the Closing from the grant, sale or transfer of rights to GTx's SARD or SARM technology that occurs during the 10-year period after the Closing (or in the eleventh year if based on a term sheet approved during the

initial 10-year period) and to receive royalties on the sale of any SARD products by the combined company during the 15-year period after the Closing. Under the CVR agreement, Oncternal (as successor in interest to GTx) agreed to use commercially reasonable efforts to develop SARD products and to divest SARM technology, subject to certain limitations. The CVRs are not transferable, except in certain limited circumstances, will not be certificated or evidenced by any instrument and will not be registered with the SEC or listed for trading on any exchange. The CVR agreement will be effective prior to the closing and will continue in effect until the payment of all amounts payable thereunder, unless terminated upon termination of the Merger Agreement. Due to the contingent nature of the CVR, no purchase price value has been assigned herein.

2. Estimated Purchase Price

The accompanying unaudited pro forma condensed consolidated financial statements reflect an estimated reverse asset acquisition price of approximately $30.5 million. Given that the estimated purchase price is variable depending upon GTx's stock price, management performed a sensitivity analysis over the change in purchase consideration based on +/- 10% volatility in GTx' stock price. An increase or decrease in GTx's stock price by 10% would increase or decrease the purchase consideration by approximately $3.0 million. Under certain circumstances further described in the merger agreement, the ownership percentages may be adjusted upward or downward based on cash levels of the respective companies at the closing of the merger.

The total estimated purchase price and allocated purchase price is summarized as follows (in thousands, except share and per share data):

Estimated number of shares of the combined company to be owned by GTx stockholders (i)	24,207,270
Multiplied by the fair value per share of GTx common stock (ii)	$ 1.20
Total	29,049
Estimated transaction costs	1,500
Total estimated purchase price	$ 30,549

For purposes of this pro forma analysis, the above estimated purchase price has been allocated based on a preliminary estimate of the fair value of assets and liabilities to be acquired.

	December 31, 2018 (in thousands)
Cash, cash equivalents and short-term investments as of December 31, 2018	$ 28,458
Other net working capital deficit acquired as of December 31, 2018	(2,460)
In-process research and development (iii)	4,551
Total estimated purchase price	$ 30,549

(i) The final purchase price will be determined based on the number of shares of common stock of the combined company that GTx stockholders own as of the closing date of the merger. For purposes of this unaudited pro forma condensed combined financial information, the estimated number of shares represents 24,207,270 shares of GTx common stock outstanding or issuable under the GTx Director Deferred Compensation Plan as of March 31, 2019. Consideration related to the fair value of GTx stock options vested and outstanding at the date of the closing of the merger has been excluded from the calculation as the amount allocated to the acquisition and the post-merger expense that will have a continuing impact to the combined company is not considered to be material. The estimated number of shares does not reflect the impact of a proposed reverse stock split that is expected to be effected prior to consummation of the merger.

(ii) The estimated purchase price was based on the closing price as reported on the Nasdaq Global Market on March 29, 2019. The final purchase price arising from the actual transaction costs as well as the number of shares of and fair market value of GTx common stock outstanding immediately prior to the closing of the merger could result in a total purchase price different from that assumed in this unaudited pro forma condensed combined financial information, and that difference may be material. Therefore, the estimated consideration expected to be transferred reflected in this unaudited pro forma condensed combined financial information does not purport to represent what the actual consideration transferred will be when the merger is completed. The actual purchase price will fluctuate until the closing date of the merger, and the final valuation of the purchase consideration could differ significantly from the current estimate.

(iii) IPR&D represents the research and development projects of GTx which were in-process, but not yet completed, and which Oncternal plans to advance. This includes the development of GTx's preclinical SARD technology. Current accounting standards require that the fair value of IPR&D projects acquired in an asset acquisition with no alternative future use be allocated a portion of the consideration transferred and charged to expense at the acquisition date. The acquired assets did not have outputs or employees. The actual purchase price allocated to IPR&D will fluctuate until the closing date of the merger, and the final valuation of the IPR&D consideration could differ significantly from the current estimate.

3. Pro Forma Adjustments

Adjustments included in the column under the heading "Pro Forma Adjustments" are primarily based on the preliminary purchase price valuation and certain adjustments to conform Oncternal's historical amounts to GTx's financial statements presentation. Further analysis will be performed after the completion of the merger to confirm these estimates or make adjustments in the final purchase price allocation, as necessary.

Given Oncternal's history of net losses and valuation allowance, management assumed a statutory tax rate of 0%. Therefore the pro forma adjustments to the statement of operations resulted in no additional income tax adjustment to the pro forma financials.

The pro forma adjustments, as of December 31, 2018, relate to the following:

A. To reflect the elimination of GTx's historical stockholders' equity balances, including accumulated deficit.

B. To reflect the estimated fair value of the common stock retained by GTx stockholders.

C. To reflect: (i) the conversion of Oncternal convertible preferred stock to GTx common Stock, (ii) the reclassification of Oncternal's warrant liability to a warrant to purchase GTx's common stock in connection with the merger which will be classified within stockholders' equity, and (iii) issuance of GTx common stock in exchange for outstanding Oncternal common stock.

D. To reflect GTx's wind down of operations including cash reserved for severance charges for GTx employees, tail insurance coverage and combined estimated merger relates costs.

E. This pro forma adjustment is not reflected in the unaudited pro forma condensed combined statement of operations because these amounts are not expected to have a continuing effect on the operating results of the combined company.

F. To reflect the net stock compensation expense related to the accelerated vesting of stock option awards to employees of GTx upon closing of the merger as well as stock compensation expense related to the modification of the term and accelerated vesting of options of employees terminated in the first quarter of 2019. As of the close of the merger, all outstanding options will be fully vested with no requisite future service. This pro forma adjustment is not reflected in the unaudited pro forma condensed combined statement of operations because these amounts are not expected to have a continuing effect on the operating results of the combined company (as the warrant liability is reclassified to equity upon consummation of the merger).

G. To record the following adjustments to additional paid-in-capital (in thousands):

	December 31, 2018
Elimination of GTx additional paid-in capital (A)	$ (626,142)
To reflect the fair value of the common stock retained by GTx stockholders (B)	30,638
Conversion of Oncternal convertible preferred stock and warrant liability (C)	47,194
Stock-based compensation related to accelerated GTx options vesting and modifications (F)	4,544
Total	$ (543,766)

H. To record the following accumulated deficit adjustments (in thousands):

	December 31, 2018
Elimination of GTx accumulated deficit (A)	$ 600,055
Estimated transaction costs (D)	(8,859)
Stock-based compensation related to accelerated GTx options vesting and modifications (F)	(4,544)
In-process research and development	(4,551)
Total	$ 582,101

I. Earnings Per Share

The unaudited pro forma combined basic and diluted earnings per share for the year ended December 31, 2018 reflects the respective weighted-average common shares outstanding of GTx and Oncternal. Oncternal's weighted-average common shares outstanding of 57,562,134 reflect the conversion at Closing of each share of outstanding Oncternal preferred stock into one share of Oncternal common stock (subject to adjustment to account for the GTx Reverse Stock Split, if consummated).

DESCRIPTION OF GTX'S CAPITAL STOCK

The following description of GTx's capital stock is not complete and may not contain all the information you should consider before investing in GTx's capital stock. This description is summarized from, and qualified in its entirety by reference to, GTx's restated certificate of incorporation, which has been publicly filed with the SEC. See "Where You Can Find More Information." The following information does not give effect to the GTx Reverse Stock Split described in Proposal No. 2 in this proxy statement/prospectus/information statement.

General

As of the date of this proxy statement/prospectus/information statement, GTx's authorized capital stock consists of 60,000,000 shares of common stock, $0.001 par value per share, and 5,000,000 shares of preferred stock, $0.001 par value per share. As of March 31, 2019, there were 24,051,844 shares of GTx common stock outstanding and no shares of preferred stock outstanding.

The following summary description of our capital stock is based on the provisions of GTx's certificate of incorporation and bylaws, the applicable provisions of the General Corporation Law of the State of Delaware, or DGCL, and the agreements described below. This information may not be complete in all respects and is qualified entirely by reference to the provisions of GTx's certificate of incorporation and bylaws, the DGCL and such agreements. For information on how to obtain copies of GTx's certificate of incorporation, bylaws and such agreements, which are exhibits to the registration statement of which this proxy statement/prospectus/information statement is a part, see the section entitled "Where You Can Find More Information."

Common Stock

The holders of GTx common stock are entitled to one vote for each share held of record on all matters submitted to a vote of stockholders. The holders of GTx common stock do not have cumulative voting rights in the election of directors. Subject to preferences that may be applicable to any outstanding shares of preferred stock, the holders of common stock are entitled to receive ratably such dividends as may be declared by the GTx board of directors out of legally available funds. Upon liquidation, dissolution or winding up, holders of GTx common stock are entitled to share ratably in all assets remaining after payment of liabilities and the liquidation preferences of any outstanding shares of preferred stock. Holders of common stock have no preemptive rights and no right to convert their common stock into any other securities. There are no redemption or sinking fund provisions applicable to GTx common stock.

The rights of the holders of GTx common stock are subject to, and may be adversely affected by, the rights of holders of shares of any preferred stock that GTx may designate and issue in the future.

Preferred Stock

GTx's certificate of incorporation provides that the GTx board of directors has the authority, without further action by the stockholders, to designate and issue up to 5,000,000 shares of preferred stock in one or more series, to establish from time to time the number of shares to be included in each such series, and to determine or alter for each such series, such voting powers, full or limited, or no voting powers, and such designation, preferences, and relative, participating, optional, or other rights and such qualifications, limitations, or restrictions thereof, and to increase or decrease the number of shares of any such series, but not below the number of shares of such series then outstanding. The GTx board of directors may authorize the issuance of preferred stock with voting or conversion rights that could adversely affect the voting power or other rights of the holders of our common stock. The issuance of preferred stock, while providing flexibility in connection with possible acquisitions and other corporate purposes, could, among other things, have the effect of delaying, deterring or preventing a change in control of GTx or making removal of management more difficult, and may adversely affect the market price of GTx common stock and the voting and other rights of the holders of GTx common stock.

Registration Rights

In September 2017, GTx completed a private placement of immediately separable units comprised of an aggregate of 5,483,320 shares of GTx common stock and warrants to purchase an aggregate of 3,289,988 shares of GTx common stock. Pursuant to the terms of the securities purchase agreement GTx entered into in connection with this private placement, GTx agreed to file as many registration statements with the SEC as may be necessary to cover the resale of all of the shares of common stock that GTx issued to, or are issuable upon the exercise of warrants that GTx issued to, the investors in the private placement, to use its reasonable best efforts to have all such registration statements declared effective as required by and within the timeframes set forth in the securities purchase agreement, and to keep such registration statements effective for up to two years following the closing date of the private placement. In October 2017, GTx filed a registration statement under the Securities Act registering the resale of all 8,773,308 shares of common stock that GTx issued to, or are issuable upon the exercise of warrants that it issued to, the investors in the private placement. In the event that any required registration statements are not filed or declared effective within the timeframes set forth in the securities purchase agreement, or any such effective registration statements subsequently become unavailable, GTx would, subject to certain limited exceptions, be required to pay liquidated damages equal to 1.0% of the aggregate unit purchase price under the securities purchase agreement per month for each default (up to a maximum of 10% of such aggregate unit purchase price). In addition, J.R. Hyde, III, a member of the GTx board of directors, and an affiliate of Mr. Hyde's, have rights under a separate registration rights agreement with GTx to require it to file resale registration statements covering an additional 785,297 shares of GTx common stock held in the aggregate or to include these shares in registration statements that GTx may file for itself or other stockholders. The foregoing registration rights do not apply or have been waived with respect to the registration statement of which this proxy statement/prospectus/information statement is a part, and no shares held by or issuable to the foregoing investors are registered for resale hereunder.

Anti-Takeover Effects of Provisions of Delaware Law and GTx Charter Documents

Delaware Takeover Statute. GTx is subject to Section 203 of the DGCL. Section 203 generally prohibits a public Delaware corporation such as GTx from engaging in a "business combination" with an "interested stockholder" for a period of three years following the time that the stockholder became an interested stockholder, unless:

- prior to the time the stockholder became an interested stockholder, the board of directors of the corporation approved either the business combination or the transaction which resulted in the stockholder becoming an interested stockholder;
- upon consummation of the transaction which resulted in the stockholder becoming an interested stockholder, the interested stockholder owned at least 85% of the voting stock of the corporation outstanding at the time the transaction commenced, excluding for purposes of determining the number of shares outstanding (a) shares owned by persons who are directors and also officers and (b) employee stock plans in which employee participants do not have the right to determine confidentially whether shares held subject to the plan will be tendered in a tender or exchange offer; or
- at or subsequent to the time the stockholder became an interested stockholder, the business combination is approved by the board and authorized at an annual or special meeting of stockholders, and not by written consent, by the affirmative vote of at least 66-2/3% of the outstanding voting stock which is not owned by the interested stockholder.

Section 203 defines a business combination to include:

- any merger or consolidation involving the corporation and the interested stockholder;
- any sale, lease, exchange, mortgage, pledge, transfer or other disposition (in one transaction or a series of transactions) involving the interested stockholder of 10% or more of the assets of the corporation (or its majority-owned subsidiary);
- subject to exceptions, any transaction that results in the issuance or transfer by the corporation of any stock of the corporation to the interested stockholder;

- subject to exceptions, any transaction involving the corporation that has the effect, directly or indirectly, of increasing the proportionate share of the stock or any class or series of the corporation beneficially owned by the interested stockholder; and
- the receipt by the interested stockholder of the benefit, directly or indirectly (except proportionately as a stockholder of such corporation), of any loans, advances, guarantees, pledges or other financial benefits, other than certain benefits set forth in Section 203, provided by or through the corporation.

In general, Section 203 defines an interested stockholder as any entity or person beneficially owning 15% or more of the outstanding voting stock of the corporation and any entity or person that is an affiliate or associate of such entity or person.

Charter Documents. The GTx certificate of incorporation and bylaws provide that the GTx board of directors be divided into three classes of directors, as nearly equal in number as possible, with each class serving a staggered three-year term. The classification system of electing directors may tend to discourage a third-party from making a tender offer or otherwise attempting to obtain control of us since the classification of the board of directors generally increases the difficulty of replacing a majority of directors. In addition, the GTx certificate of incorporation and bylaws:

- provide that any action required or permitted to be taken by our stockholders must be effected at a duly called annual or special meeting of stockholders and may not be effected by any consent in writing;
- establish advance notice requirements for nominations for election to the GTx board of directors or for proposing matters that can be acted upon at a stockholder meeting;
- provide that the authorized number of directors may be changed only by resolution of the board of directors; and
- provide that special meetings of GTx stockholders may be called only by the chairman of the GTx board of directors, the GTx chief executive officer or the GTx board of directors pursuant to a resolution adopted by a majority of the total number of authorized directors.

The DGCL provides generally that the affirmative vote of a majority of the shares entitled to vote is required to amend a corporation's bylaws, unless a corporation's certificate of incorporation requires a greater percentage or also confers the power upon the corporation's directors. The GTx bylaws may be amended or repealed by:

- the affirmative vote of a majority of our directors then in office; or
- the affirmative vote of the holders of at least 66-2/3% of the voting power of all then-outstanding shares of GTx capital stock entitled to vote generally in the election of directors.

The foregoing provisions of the GTx certificate of incorporation may only be amended or repealed by the affirmative vote of a majority of GTx directors and the affirmative vote of the holders of at least 66-2/3% of the voting power of all then-outstanding shares of GTx capital stock entitled to vote generally in the election of directors.

These and other provisions contained in the GTx certificate of incorporation and bylaws could delay or discourage some types of transactions involving an actual or potential change in control or change in management, including transactions in which stockholders might otherwise receive a premium for their shares over then current prices, and may limit the ability of stockholders to remove current management or approve transactions that stockholders may deem to be in their best interests and, therefore, could adversely affect the price of GTx common stock.

Transfer Agent and Registrar

The transfer agent and registrar for GTx common stock is Computershare Trust Company, N.A. Its address is 250 Royall Street, Canton, MA 02021.

COMPARISON OF RIGHTS OF HOLDERS OF GTX STOCK AND ONCTERNAL STOCK

Both GTx and Oncternal are incorporated under the laws of the State of Delaware and, accordingly, the rights of the stockholders of each are currently, and will continue to be, governed by the DGCL. If the merger is completed, Oncternal's stockholders will become stockholders of GTx, and their rights will be governed by the DGCL, the amended and restated bylaws of GTx and, assuming Proposal Nos. 2 and 3 are approved by GTx's stockholders at the GTx special meeting, the restated certificate of incorporation of GTx as amended by the amendments thereto attached to this proxy statement/prospectus/information statement as *Annex D* and *Annex E*.

The table below summarizes the material differences between the current rights of Oncternal's stockholders under Oncternal's amended and restated certificate of incorporation and bylaws, and the rights of GTx's stockholders, post-merger, under GTx's restated certificate of incorporation and amended and restated bylaws, each as amended, as applicable, and as in effect immediately following the merger.

While GTx and Oncternal believe that the summary tables cover the material differences between the rights of their respective stockholders prior to the merger and the rights of GTx's stockholders following the merger, these summary tables may not contain all of the information that is important to you. These summaries are not intended to be a complete discussion of the respective rights of GTx's and Oncternal's stockholders and are qualified in their entirety by reference to the DGCL and the various documents of GTx and Oncternal that are referred to in the summaries. You should carefully read this entire proxy statement/prospectus/information statement and the other documents referred to in this proxy statement/prospectus/information statement for a more complete understanding of the differences between being a stockholder of GTx or Oncternal before the merger and being a stockholder of GTx after the merger. GTx has filed copies of its current restated certificate of incorporation and amended and restated bylaws with the SEC and will send copies of the documents referred to in this proxy statement/prospectus/information statement to you upon your request. Oncternal will also send copies of its documents referred to in this proxy statement/prospectus/information statement to you upon your request. See the section entitled "Where You Can Find More Information" in this proxy statement/prospectus/information statement.

Current Oncternal Rights Versus Post-Merger GTx Rights

Provision	Oncternal (Pre-Merger)	GTx (Post-Merger)
ELECTIONS; VOTING; PROCEDURAL MATTERS		
Authorized Capital Stock	The amended and restated certificate of incorporation of Oncternal authorizes the issuance of up to 200,000,000 shares of common stock, $0.0001 par value per share, and 130,099,288 shares of preferred stock, $0.0001 par value per share, 48,000,000 of which are designated as "Series C preferred stock", 61,788,567 of which are designated as "Series B-2 preferred stock", 6,750,721 of which are designated as "Series B-1 preferred stock" and 13,560,000 of which are designated as "Series A preferred stock."	The restated certificate of incorporation of GTx authorizes the issuance of up to 60,000,000 shares of common stock, par value $0.001 per share, and 5,000,000 shares of preferred stock, par value $0.001 per share.
Number of Directors	The amended and restated bylaws of Oncternal provides that number of directors which shall constitute the whole Board of Directors shall be	The restated certificate of incorporation of GTx currently provides that the number of directors that shall constitute the whole board of directors of GTx

Provision	Oncternal (Pre-Merger)	GTx (Post-Merger)
	determined from time to time solely by resolution adopted by the affirmative vote of a majority of the directors. The amended and restated certificate of incorporation of Oncternal currently provides that the authorized number of directors is nine.	shall be fixed exclusively by resolution adopted by the affirmative vote of a majority of the authorized Directors.
Stockholder Nominations and Proposals	The amended and restated certificate of incorporation and amended and restated bylaws of Oncternal do not provide for procedures with respect to stockholder proposals or director nominations.	The amended and restated bylaws of GTx provide that nominations of any person for election to the GTx board of directors may be made at an annual meeting or a special meeting of the stockholders (i) pursuant to the Corporation's notice with respect to such meeting; (ii) by or at the direction of the Board of Directors; or (iii) by any stockholder of the Corporation who was stockholder of record at the time of giving the stockholders notice provided for in the bylaws, who is entitled to vote at the meeting and who complied with the notice procedures. The amended and restated bylaws of GTx provide that in order for a stockholder to properly bring business before an special meeting, (i) the stockholder must have given timely notice thereof in writing to the Secretary of the Corporation, (ii) such other business must be a proper matter for stockholder action under the DGCL, (iii) if the stockholder, or the beneficial owner on whose behalf any such proposal or nomination is made, has provided the Corporation with notice, such stockholder or beneficial owner must, in the case of a proposal, delivered a proxy statement and form of proxy to holders of at least the percentage of the Corporation's voting shares required under applicable law to carry any such proposal, or in the case of a nomination or nominations, have delivered a proxy statement of form of proxy to holders of a percentage of the Corporation's voting shares reasonably believed by such stockholder or beneficial owner to be sufficient to elect the nominee or nominees proposed to be nominated by such stockholder, and must, in either

Provision	Oncternal (Pre-Merger)	GTx (Post-Merger)
		case, have included such materials in the notice, and (iv) if no notice relating thereto has been timely provided pursuant to the bylaws, the stockholder or beneficial owner proposing such business or nomination must not have solicited a number of proxies sufficient to have required the delivery of a notice under the bylaws.
Classified Board of Directors	The amended and restated certificate of incorporation of Oncternal provides that the holders of Series A preferred stock, voting as a separate class and to the exclusion of all other classes of capital stock of the Corporation, may elect 1 director (the "Series A Director"); the holders of Series B-2 Preferred Stock, voting as a separate class and to the exclusion of all other classes of capital stock of the Corporation, may elect 2 directors (the "Series B-2 Directors); the holders of the Series C preferred stock, voting as a separate class and to the exclusion of all other classes of capital stock of the Corporation, may elect 2 directors (the "Series C Directors" and together with the Series A Director and the Series B-2 Directors, the "Preferred Directors"). The holders of Common Stock, voting as a separate class and to the exclusion of all other classes of capital stock of the Corporation, may elect 2 directors (the "Common Directors"). The holders of the outstanding shares of Common Stock and Preferred Stock, voting together as a single class, are entitled to elect the remaining directors (the "General Directors").	The restated certificate of incorporation of GTx provides that the directors comprising the board of directors of GTx shall be divided into three staggered classes, with each class serving a three-year term.
Removal of Directors	Under the amended and restated certificate of incorporation of Oncternal, any director may be removed, with or without cause, only by the affirmative vote of the holders of a majority of the shares eligible to vote in an election for the seat occupied that director (e.g., in order to remove a Series A Director, the holders of a majority of the shares of Series A preferred stock, voting as a separate class and to the exclusion of all	Under the amended and restated bylaws of GTx, a director may be removed from office only for cause and only by the affirmative vote of the holders of at least a majority of all then outstanding shares of capital stock of the Corporation then entitled to vote in the election of directors, voting together as a single class.

Provision	Oncternal (Pre-Merger)	GTx (Post-Merger)
	other classes of capital stock of the Corporation, must so vote).	
Special Meeting of the Stockholders	The amended and restated bylaws of Oncternal provide that special meetings of stockholders may be called by the President and shall be called by the Chairman of the Board, President or the Secretary at the request in writing of a majority of the Board of Directors, or at the request in writing of stockholders owning a majority in amount of the entire capital stock of the corporation issued and outstanding, and entitled to vote. Such request shall state the purpose or purposes of the proposed meeting. Business transacted at any special meeting of stockholders shall be limited to the purposes stated in the notice.	The restated certificate of incorporation of GTx provides that a special meeting of the stockholders may be called only by the Chairman of the Board of GTx, the Chief Executive Officer or by the Board of Directors acting pursuant to a resolution adopted by a majority of the authorized number of directors, and any power of stockholders to call a special meeting is specifically denied.
Cumulative Voting	The amended and restated certificate of incorporation and amended and restated bylaws of Oncternal do not have a provision granting cumulative voting rights in the election of its directors.	The restated certificate of incorporation of GTx does not have a provision granting cumulative voting rights in the election of its directors.
Vacancies	The amended and restated certificate of incorporation of Oncternal provides that in the case of any vacancy of a director occurring among the Preferred Directors or the Common Directors, by the affirmative vote of the holders of a majority of the shares of the class or classes entitled to vote on the election of the Preferred Directors or the Common Directors, as the case may be, such holders shall elect a successor or successors to hold the office for the unexpired term of the director or directors whose place or places shall be vacant. In the case of any vacancy in the office of a General Director, the affirmative vote of the holders of a majority of the shares of Preferred Stock and Common Stock, voting as a single class, such holders shall elect a successor or successors to hold the officer for the unexpired term of the director or directors shoes place or places shall be vacant.	The restated certificate of incorporation and amended and restated bylaws of GTx provide that any vacancy on the board of directors of GTx will be filled only by the affirmative vote of a majority of the directors in office, even though less than a quorum, unless the board of directors of GTx determines by resolution that any such vacancies or newly created directorships shall be filled by the stockholders.

Provision	Oncternal (Pre-Merger)	GTx (Post-Merger)
Voting Stock	Under the amended and restated certificate of incorporation of Oncternal, the holders of common stock are entitled to one vote for each share of stock held by them and holders of preferred stock are entitled to one vote for each share of common stock into which such share of preferred stock is convertible determined by reference to the applicable Conversion Price in effect at the record date of the determination of the holders of the shares entitled to vote or, if no such record date is established, at the date such vote is taken or any written consent of stockholders is first solicited. Except as otherwise provided by law or in the amended and restated certificate of incorporation, the holders of Preferred Stock shall vote together with the holders of the outstanding shares of Common Stock, and not as a separate class or series.	Under the restated certificate of incorporation and amended and restated bylaws of GTx, each outstanding share of Common Stock shall be entitle the holder thereof to one vote in person or by proxy on each matter properly submitted to the stockholders at a meeting of the stockholders; provided, however, that except as otherwise required by law, holders of Common Stock shall not be entitled to vote on any amendment to the Certificate of Incorporation that relates solely to the terms of one or more outstanding series of Preferred Stock if the holders of such affected series are entitled, either separately or together as a class with the holders of one or more other such series, to vote thereon by low or pursuant to the Certificate of Incorporation.
Stockholders Agreement; Voting Agreement	Oncternal does not have a stockholders agreement. Oncternal and the stockholders of Oncternal have entered into that certain Amended and Restated Voting Agreement dated September 22, 2018, which provides, among other things, that: (i) two Common Directors shall be designated by the holders of a majority of the shares of Oncternal's common stock; (ii) two Series C Directors shall be designated by SPH USA (for so long as SPH USA and its affiliated parties continue to hold at least 17,000,000 shares (as adjusted for stock splits, dividends and the like with respect to such shares) of Series C preferred stock of Oncternal; (iii) one Series B-2 Director shall be designated by MagnaSci Fund L.P. (for so long as MagnaSci Fund L.P. and its affiliated parties continues to hold at least 7,000,000 shares (as adjusted for stock splits, dividends and the like with respect to such shares) of Series B-2 preferred stock. Under the Merger Agreement, Oncternal has agreed to terminate the	GTx does not have a stockholders agreement or similar agreement with any of its stockholders in place.

Provision	Oncternal (Pre-Merger)	GTx (Post-Merger)
	Amended and Restated Voting Agreement at or prior to the closing of the merger.	
Drag Along	Under the Oncternal Amended and Restated Voting Agreement dated September 22, 2018, as further described therein, if (i) the Board, (ii) the holders of a majority of the then outstanding shares of Series A preferred stock, (iii) the holders of a majority of the then outstanding shares of Series B preferred stock and Series B-2 preferred stock, voting together, and (iv) the holders of a majority of the then outstanding shares of Series C preferred stock (the "Proposing Holders") approve a Change of Control Transaction (as defined in the Amended and Restated Voting Agreement) then each of the Significant Common Holders agrees to vote for, consent to and otherwise raise no objections to such Change of Control Transaction and (i) if such Change of Control Transaction is structured as a consolidation, merger or asset sale of the Company, or a sale of all or substantially all of the Company's assets, each of the Significant Common Holders shall waive any dissenters' rights, appraisal rights or similar rights in connection with such consolidation, merger or asset sale, or (ii) if such Change of Control Transaction is structured as a sale of the capital stock of the Company, each of the Significant Common Holders shall agree to sell all shares of the Company's capital stock held by them on the terms and conditions approved by the Board and the Proposing Holders.	GTx does not have drag along terms in place.
Stockholder Action by Written Consent	The amended and restated bylaws of Oncternal provide that any action required to be taken at any annual or special meeting of stockholders of the corporation, or any action which may be taken at any annual or special meeting of such stockholders, may be taken without a meeting, without prior notice and without a vote, if a consent in writing, setting forth the action so taken, shall be signed by the holders of outstanding	The restated certificate of incorporation and amended and restated bylaws of GTx specify that no action shall be taken by the stockholders except at an annual or special meeting of the stockholders and further explicitly provides that no action shall be taken by the stockholders by written consent.

Provision	Oncternal (Pre-Merger)	GTx (Post-Merger)
	stock having not less than the minimum number of votes that would be necessary to authorize or take such action at a meeting at which all shares entitled to vote thereon were present and voted and shall be delivered to the corporation by delivery to its registered office in Delaware, its principal place of business, or to an officer or agent of the corporation having custody of the book in which proceedings of meetings of stockholders are recorded.	
Notice of Stockholder Meeting	The amended and restated bylaws of Oncternal provide that notices of all meetings shall state the place, day and hour of the meeting and, in the case of a special meeting, the purpose or purposes for which the meeting is called. The amended and restated bylaws of Oncternal provide that notice of each meeting of stockholders shall be given not less than 10 nor more than 60 days before the date of the meeting to each stockholder entitled to vote at such meeting.	Under the amended and restated bylaws of GTx, written notice of each stockholder meeting must specify the place, date and hour of the meeting, the means of remote communication(s), if any, by which stockholders and proxyholders may be deemed to be present in person and vote at such meeting, and, in the case of a special meeting, the purposes for which the meeting is called. Notice shall be given not less than 10 nor more than 60 calendar days before the date of the meeting to each stockholder entitled to vote at such meeting.
Conversion Rights and Protective Provisions	The amended and restated certificate of incorporation of Oncternal provides that each holder of shares of Oncternal preferred stock shall, subject to certain conditions, have the right to convert such shares into shares of Oncternal common stock at any time in accordance with the amended and restated certificate of incorporation of Oncternal. In addition, in the event of any capital reorganization, any reclassification of the Common Stock (other than a change in par value as a results of a stock dividend, subdivision, split-up or combination of shares), the consolidation or merger of the Corporation with or into another Person (subject to certain exceptions) (collectively referred to as “Reorganizations”), the holders of the Preferred Stock shall thereafter be entitled to receive, upon conversion of the Preferred Stock the kind and number	The restated certificate of incorporation of GTx does not provide that holders of GTx stock shall have preemptive, conversion or other protective rights.

Provision	Oncternal (Pre-Merger)	GTx (Post-Merger)
	of shares of Common Stock or other securities or property (including cash) of the Corporation, or other corporation resulting from such consolidation or surviving such merger to which a holder of the number of shares of Common stock of the Corporation which the applicable series of preferred stock entitled the holder thereof to convert immediately prior to such Reorganization would have been entitled to receive with respect to such Reorganization. For so long as any shares of Oncternal's preferred stock shall be outstanding Oncternal shall not, without a Preferred Investor Supermajority Consent (as defined in the amended and restated certificate of incorporation): (i) declare or pay any dividends on any capital stock of the Corporation; (ii) redeem or repurchase capital stock of the Corporation except in connection with the repurchase of shares of Common Stock issued to or held by employees, consultants, officers and directors upon termination of their employment or services pursuant to agreements providing for the right of said repurchase, which agreements were authorized by the Board of Directors; (iii) take any action which would result in a Reorganization, a Liquidation Event or a Deemed Liquidation Event (each as defined in the amended and restated certificate of incorporation); (iv) increase or decrease the total number of authorized members of the Board of Directors; (v) increase or decrease the authorized number of shares of Common Stock or Preferred Stock; (vi) authorize, create or issue (whether by merger, consolidation, reclassification, amendment of the amended and restated certificate of incorporation, sale or otherwise) shares of any class or series of stock not authorized in the amended and restated certificate of incorporation having rights, preferences or privileges superior to or on parity with the Preferred Stock; (vii) create, or authorize the creation of, issue, or authorize the	

Provision	Oncternal (Pre-Merger)	GTx (Post-Merger)
	issuance of any debt security, if the aggregate indebtedness of the Corporation for borrowed money following such action would exceed $1,000,000; (viii) create any Subsidiary that is not wholly-owned (either directly or through one or more other Subsidiaries) by the Corporation, or enter into any joint venture or partnership with any Person; (ix) enter into any contract to purchase, sell, assign, transfer, exclusively license, pledge, hypothecate, grant a security interest in or otherwise acquire, dispose of or encumber, in whole or in part, all or substantially all of the Corporation's intellectual property; (x) increase the number of shares of Common stock authorized under any existing stock or option plan, or create a new stock or option plan; or (xi) take any action to amend or waive any provision of the amended and restated certificate of incorporation of the Corporation's Bylaws. In addition to the above protective rights, so long as any shares of Series C preferred stock shall be outstanding, Oncternal shall not, without a Series C Preferred Supermajority Interest: (i) amend, alter or repeal the rights, preference or privileges of the Series C preferred stock in a manner that is different than the effect of such change on the rights, preferences or privileges of the other classes of Preferred Stock; (ii) (A) reclassify, alter or amend any existing security of the Corporation that is pari passu with the Series C preferred stock if such reclassification, alteration or amendment would render such security senior to the Series C preferred stock in respect of any right, preference or privilege or (B) reclassify, alter or amend any existing security of the Corporation that is junior to the Series C preferred stock if such reclassification, alteration or amendment would render such security senior to or pari passu with	

Provision	Oncternal (Pre-Merger)	GTx (Post-Merger)
	the Series C preferred stock in respect of any right, preference or privilege; (iii) make, declare pay or set aside, or allow any Subsidiary to make declare, pay or set aside, any dividend, distribution or spin out of assets of the Corporation to any officer, director or stockholder of the Corporation, or any affiliate of such officer, director or stockholder, unless approved by the Board of Directors, including at least one of the Series C Directors; or (iv) increase or decrease the authorized shares of Series C preferred stock.	
Right of First Refusal	The Oncternal Amended and Restated Co-Sale Agreement entered into among Oncternal and certain stockholders dated September 22, 2018 provides that any holder of common stock that is a party to the Amended and Restated Co-Sale Agreement wishing to transfer any shares of common stock shall first provide Oncternal with the right to purchase such shares. In such an event, if Oncternal does not elect to exercise its right of first refusal in full, Investors party to the Amended and Restated Co-Sale Agreement have a secondary right of first refusal to purchase all or any portion of the shares of Oncternal common stock which are proposed for sale or transfer by the holders of Oncternal common stock that are a party to the Amended and Restated Co-Sale Agreement. Under the Merger Agreement, Oncternal has agreed to terminate the Amended and Restated Co-Sale Agreement at or prior to the closing of the merger.	GTx does not have a right of first refusal in place.
Right of Co-Sale	As further described in the Oncternal Amended and Restated Co-Sale Agreement, the investors party to the Amended and Restated Co-Sale Agreement have a right of co-sale with respect to any common stock proposed to be transferred or sold by any holder of common stock that is a party to the	GTx does not have a right of co-sale in place.

Provision	Oncternal (Pre-Merger)	GTx (Post-Merger)
	Amended and Restated Co-Sale Agreement which is not earlier purchased by Oncternal by exercise of its right of first refusal.	
Pro Rata Rights	The Oncternal Amended and Restated Investors' Rights Agreement entered into among Oncternal and certain Investors, dated September 22, 2018 provides each of the Investors party to the Amended and Restated Investors' Rights Agreement with a right of first refusal to purchase his or its pro rata share (as defined therein) of new securities which Oncternal proposes to sell and issue after September 22, 2018, subject to certain exceptions as further described therein. Under the Merger Agreement, Oncternal has agreed to terminate the Oncternal Amended and Restated Investors' Rights Agreement at or prior to the closing of the merger.	GTx does not have a pro rata rights provision in place.
Indemnification of Officers and Directors and Advancement of Expenses; Limitation on Personal Liability		
Indemnification	The amended and restated certificate of incorporation of Oncternal provides that to the fullest extent permitted by applicable law, a director of Oncternal shall not be personally liable to the Corporation or its stockholders for monetary damages for breach of fiduciary duty as a director. The amended and restated bylaws and the amended and restated certificate of incorporation of Oncternal provide that Oncternal shall have the power to indemnify its directors and officers to the fullest extent permitted by applicable law. Oncternal has entered into a number of indemnification agreements with its officers and directors.	The restated certificate of incorporation of GTx provides that a director of GTx shall not be personally liable to GTx or its stockholders for monetary damages for breach of fiduciary duty as a director. The amended and restated bylaws and the restated certificate of incorporation of GTx provide that GTx shall indemnify and hold harmless its directors and officers to the fullest extent permitted by applicable law, except that GTx will not be required to indemnify or hold harmless any director or officer in connection with any proceeding initiated by such person unless the proceeding was authorized by the board of directors of GTx. Under the amended and restated bylaws of GTx, such rights shall not be exclusive of any other rights acquired by directors and officers, including by agreement.
Advancement of Expenses	The amended and restated bylaws of Oncternal provide that expenses incurred by an officer or director in defending any civil, criminal, administrative or investigative action, suit or proceeding shall be paid by the corporation in	The amended and restated bylaws of GTx provide that GTx may, in its discretion and upon such terms and conditions, if any, as the Corporation deems appropriate, advance the expenses incurred by such director, officer,

Provision	Oncternal (Pre-Merger)	GTx (Post-Merger)
	advance of the final disposition of such action, suit or proceeding upon receipt of an undertaking by or on behalf of such director or officer to repay such amount if it shall ultimately be determined that he or she is not entitled to be indemnified by the corporation.	employee or agent of the Corporation in defending such action, suit or proceeding prior to its final disposition.
Dividends		
Declaration and Payment of Dividends	The amended and restated certificate of incorporation of Oncternal provides that, subject to the prior rights of holders of all classes of stock at the time outstanding having prior rights as to dividends, the holders of the Common Stock shall be entitled to receive, when, as and if declared by the Board of Directors, out of any assets of the Corporation legally available therefor, any dividends as may be declared from time to time by the Board of Directors.	The amended and restated bylaws of GTx provide that, subject to any restrictions contained in the DGCL or the restated certificate of incorporation of GTx, the board of directors of GTx is empowered to declare and pay dividends upon the shares of GTx capital stock. Dividends may be paid in cash, in property or in shares of GTx capital stock.
Amendments to Certificate of Incorporation or Bylaws		
General Provisions	The amended and restated certificate of incorporation of Oncternal provides that Oncternal reserves the right to amend, alter, change or repeal any provision of the amended and restated certificate of incorporation, in the manner now or hereafter prescribed by statute, and all rights conferred upon stockholders therein are granted subject to this reservation. The amended and restated bylaws of Oncternal provide that the bylaws may be altered, amended or repealed by the stockholders of Oncternal or by the board of directors of Oncternal, when such power is conferred upon the board of directors by Oncternal's then current certificate of incorporation.	The restated certificate of incorporation of GTx may be amended in any manner otherwise permitted by law, with the exception that under the restated certificate of incorporation of GTx, Article V (relating to the composition of and vacancies on the board of directors of GTx, election and removal of directors), Article VI (relating to voting rights and special meetings of stockholders), Article VII (relating to adopting, amending or repealing the Bylaws of the Corporation), Article VIII (relating to limitation of liability for directors) and Article IX (relating to the amendment of the certificate of incorporation) require the affirmative vote of the holders of 66 and 2/3% of the voting power of the outstanding shares of voting stock entitled to vote generally in the election of directors, voting together as a single class.

PRINCIPAL STOCKHOLDERS OF GTX

The following table sets forth certain information with respect to the beneficial ownership of GTx's common stock as of March 31, 2019 (except where otherwise indicated) for:

- each person, or group of affiliated persons, who are known by us to beneficially own more than 5% of the outstanding shares of GTx common stock;
- each of GTx's directors as of March 31, 2019;
- each of GTx's named executive officers, as identified in "The Merger—Interests of GTx's Directors and Executive Officers in the Merger—Ownership Interests"; and
- all of the current directors and executive officers of GTx as a group.

The number of shares beneficially owned by each entity, person, director or executive officer is determined under the rules of the SEC and the information is not necessarily indicative of beneficial ownership for any other purpose. Under such rules, beneficial ownership includes any shares as to which the individual has the sole or shared voting power or investment power and also any shares that the individual has the right to acquire within 60 days of March 31, 2019, through the exercise of any stock option or other right. Unless otherwise indicated, each person has sole investment and voting power, or shares such powers with his or her spouse, with respect to the shares set forth in the following table.

The percentage of ownership is based on 24,051,844 shares of common stock outstanding on March 31, 2019, adjusted as required by the rules promulgated by the SEC to determine beneficial ownership. GTx does not know of any arrangements, including any pledge by any person of securities of GTx, the operation of which may at a subsequent date result in a change of control of GTx. Unless otherwise noted, the address of each director and current and former executive officer of GTx is c/o GTx, Inc., 17 W Pontotoc Ave., Suite 100, Memphis, Tennessee 38103.

	Beneficial Ownership	
Name and Address of Beneficial Owner	Number of Shares	Percent of Total
5% Stockholders:		
The Pyramid Peak Foundation(1) 1350 Concourse Avenue, Suite 383 Memphis, Tennessee 38104	7,183,900	26.8%
Named Executive Officers and Directors:		
Marc S. Hanover(2)	304,776	1.3%
Robert J. Wills, Ph.D.(3)	150,678	*
Henry P. Doggrell(4)	107,097	*
Michael G. Carter, M.D., Ch.B., F.R.C.P.(5)	39,131	*
J. Kenneth Glass(6)	60,381	*
J. R. Hyde, III(7)	10,010,446	36.7%
Garry A. Neil, M.D.(8)	53,426	*
Kenneth S. Robinson, M.D., M.Div.(9)	79,605	*
All Directors and Executive Officers as a group (9 persons)(10)	10,848,287	39.2%

* Represents less than 1% of the outstanding shares of GTx's common stock.

(1) Based on information provided to GTx as of February 28, 2019. Includes an aggregate of 2,793,657 shares issuable upon exercise of outstanding warrants. James R. Boyd, Lee B. Harper, O. Mason Hawkins and Andrew R. McCarroll are each a director of the Foundation. Each of such individuals may be deemed to share beneficial ownership of the shares beneficially owned by the Foundation. The foregoing ownership information was provided to us as of February 28, 2019, and, consequently, beneficial ownership may have changed between such date and March 31, 2019.

(2) Includes 35,287 shares held by Equity Partners XII, LLC, an entity controlled by Mr. Hanover, 22,726 shares issuable upon exercise of a warrant, 12,400 shares held by trusts of which Mr. Hanover is the trustee, and 110,001 shares of common stock issuable upon the exercise of options held by Mr. Hanover.

(3) Includes 13,334 shares of common stock issuable upon the exercise of options held by Dr. Wills.

(4) Includes 934 shares held by trusts with respect to which Mr. Doggrell may be deemed to have beneficial ownership, 11,435 shares held by a trust of which Mr. Doggrell is the co-trustee, 47,667 shares of common stock issuable upon the exercise of options held by Mr. Doggrell, and 400 shares of common stock held by Mr. Doggrell through an individual retirement account. Also includes 664 shares held by Mr. Doggrell's wife and 2,547 shares of common stock held by Mr. Doggrell's wife through an individual retirement account.

(5) Consists of 35,500 shares of common stock issuable upon the exercise of options held by Dr. Carter, and 3,631 shares issuable to Dr. Carter pursuant to our Directors' Deferred Compensation Plan.

(6) Includes 35,500 shares of common stock issuable upon the exercise of options held by Mr. Glass, and 655 shares issuable to Mr. Glass pursuant to our Directors' Deferred Compensation Plan. Also includes 2,450 shares of common stock held by Mr. Glass' wife through an individual retirement account.

(7) Includes 14,535 shares held by Pittco Associates III, L.P. and 391,571 shares held by Pittco Investments, L.P., entities controlled by Mr. Hyde, 2,454,483 shares issuable upon exercise of a warrant issued to Mr. Hyde in November 2014 (the "2014 Warrant"), 678,349 shares issuable upon exercise of a warrant issued to Mr. Hyde in September 2017 (the "2017 Warrant"), and 70,276 shares issuable to Mr. Hyde pursuant to our Directors' Deferred Compensation Plan. Mr. Hyde also has shared voting and dispositive power over 21,646 shares held by Mr. Hyde's spouse, 184,480 shares held by trusts for the benefit of Mr. Hyde's children (the "Hyde Family Trusts"). As trustee of the Hyde Family Trusts , John H. Pontius shares voting and dispositive power over all of the shares held by the Hyde Family Trusts.

(8) Consists of 16,667 shares of common stock issuable upon the exercise of options held by Dr. Neil, and 36,759 shares issuable to Dr. Neil pursuant to our Directors' Deferred Compensation Plan.

(9) Consists of 35,500 shares of common stock issuable upon the exercise of options held by Dr. Robinson, and 44,105 shares issuable to Dr. Robinson pursuant to our Directors' Deferred Compensation Plan.

(10) Includes 54,182 shares of common stock beneficially owned by executive officers that are not named executive officers, of which 34,634 shares were issuable upon the exercise of options held by these executive officers. For purposes of determining the number of shares beneficially owned by directors and executive officers as a group, any shares beneficially owned by more than one director or executive officer are counted only once.

PRINCIPAL STOCKHOLDERS OF ONCTERNAL

The following table and the related notes present information on the beneficial ownership of Oncternal's capital stock as of March 31, 2019 by:

- each director of Oncternal;
- each named executive officer of Oncternal;
- all of Oncternal's current directors and executive officers as a group; and
- each stockholder known by Oncternal to beneficially own more than five percent of its common stock on an as converted to common stock basis.

The percentage of ownership is based on 162,317,356 shares of Oncternal common stock outstanding on March 31, 2019, assuming the conversion of all Oncternal preferred stock into Oncternal common stock in accordance with the Merger Agreement. Beneficial ownership is determined in accordance with the rules of the SEC and includes voting or investment power with respect to the securities. Shares of Oncternal's common stock that may be acquired by an individual or group within 60 days of March 31, 2019, pursuant to the exercise of options or warrants, are deemed to be outstanding for the purpose of computing the percentage ownership of such individual or group, but are not deemed to be outstanding for the purpose of computing the percentage ownership of any other person shown in the table.

Except as indicated in the footnotes to this table, Oncternal believes that the stockholders named in this table have sole voting and investment power with respect to all shares of Oncternal's common stock shown to be beneficially owned by them, based on information provided to Oncternal by such stockholders. Unless otherwise indicated, the address for each stockholder listed is: c/o Oncternal Therapeutics, Inc., 11750 Sorrento Valley Road, Suite 250 San Diego, CA 92121.

5% Stockholders	Number of Shares	Approximate Percent Owned
Shanghai Pharmaceutical (USA) Inc.(1)	34,000,000	20.9%
Entities affiliated with MagnaSci Ventures(2)	19,422,222	11.8%

Directors and Named Executive Officers	Number of Shares	Approximate Percent Owned
James B. Breitmeyer, M.D., Ph.D.(3)	5,416,433	3.3%
Richard G. Vincent(4)	696,408	*
Hazel M. Aker(5)	128,636	*
David F. Hale(6)	9,825,423	6.1%
Cooper Collins(2)	19,422,222	11.8%
Cam Gallagher(7)	3,561,825	2.2%
Scott Glenn(8)	8,073,278	5.0%
Yanjun Liu, M.D., Ph.D.	—	*
Xin Nakanishi, Ph.D.	—	*
William R. LaRue(9)	360,511	*
Charles P. Theuer, M.D., Ph.D.	200,000	*
All current executive officers and directors as a group (11 persons)	47,684,736	29.2%

* Represents beneficial ownership of less than 1% of the shares of common stock.

(1) SPH USA is a wholly-owned subsidiary of Shanghai Pharmaceuticals Holding Co., Ltd., a joint stock company incorporated in the PRC with limited liability ("SPH"). The board of directors of SPH has voting and investment power over the shares held by SPH USA, and consists of Zhou Jun, Cho Man, Li

Yongzhong, Shen Bo, Li An, Wan Kam To, Tse Cho Che, Cai Jiangnan and Hong Liang. Directors Yanjun Liu, M.D., Ph.D. and Xin Nakanishi, Ph.D. are affiliated with SPH but do not have voting or investment power over the shares held by SPH USA. The registered address of SPH USA is Two Penn Center Plaza, Suite 200, 1500 John F. Kennedy Blvd., Philadelphia, PA 19102.

(2) Consists of (i) 9,455,556 shares of common stock and warrants to purchase 1,418,333 shares of common stock held by MagnaSci Fund, L.P., (ii) 2,444,445 shares of common stock and warrants to purchase 366,666 shares of common stock held by MagnaSci Fund II, L.P. and (iii) 4,988,888 shares of common stock and warrants to purchase 748,334 shares of common stock held by MagnaSci Co-Investments, L.L.C. MagnaSci GP, L.L.C. is the sole general partner of MagnaSci Fund and MagnaSci Fund II. Cooper Collins is a Manager of MagnaSci GP and MagnaSci Co-Investments, and has voting and investment power over the shares held by MagnaSci Fund, MagnaSci Fund II and MagnaSci Co-Investments. The address of MagnaSci Fund, MagnaSci Fund II and MagnaSci Co-Investments is 123 N. Post Oak Lane, Suite 410, Houston, Texas 77024.

(3) Consists of (i) 3,482,856 shares of common stock held directly by Dr. Breitmeyer, (ii) 1,600,000 shares of common stock underlying options held by Dr. Breitmeyer that are exercisable as of March 31, 2019 or that will become exercisable within 60 days after such date, (iii) 293,577 shares of common stock and warrants to purchase 10,000 shares of common stock held by a family trust (the “Breitmeyer Trust”), (iv) 10,000 shares of common stock held by Dr. Breitmeyer as custodian for his child and (v) 20,000 shares of common stock underlying options held by Dr. Breitmeyer’s wife, Mary Breitmeyer, that are exercisable as of March 31, 2019 or that will become exercisable within 60 days after such date. Dr. Breitmeyer and Ms. Breitmeyer are the trustees of the Breitmeyer Trust, and in such capacity have joint power to vote and dispose of the shares held by the Breitmeyer Trust.

(4) Consists of (i) 555,897 shares of common stock held directly by Mr. Vincent, including 315,512 shares subject to repurchase by Oncternal and (ii) 136,677 shares of common stock and warrants to purchase 3,834 shares of common stock held by a family trust (the “Vincent Trust”). Mr. Vincent and his wife, Stacy Vincent, are the trustees of the Vincent Trust, and in such capacity have joint power to vote and dispose of the shares held by the Vincent Trust.

(5) Consists of (i) 58,381 shares of common stock held directly by Ms. Aker and (ii) 68,338 shares of common stock and warrants to purchase 1,917 shares of common stock held by a family trust (the “Aker Trust”). Ms. Aker and her husband, Larry Aker, are the trustees of the Aker Trust, and in such capacity have joint power to vote and dispose of the shares held by the Aker Trust.

(6) Consists of (i) 9,530,554 shares of common stock and warrants to purchase 44,869 shares of common stock held by Hale BioPharma Ventures, LLC and (ii) 250,000 shares of common stock held by Hale Trading Company. Mr. Hale is the Chairman and Chief Executive Officer of Hale BioPharma Ventures and the Managing Director of Hale Trading Company, and as such has voting and investment control over the shares held by Hale BioPharma Ventures and Hale Trading Company. Amounts also include 35,000 shares that were pledged as collateral by Hale BioPharma Ventures in favor of Oxford Finance LLC on one loan.

(7) Consists of (i) 3,345,159 shares of common stock, including 263,021 shares subject to repurchase by Oncternal, and warrants to purchase 16,666 shares of common stock, held directly by Mr. Gallagher and (ii) 200,000 shares of common stock held by Mr. Gallagher as custodian for his child.

(8) Consists of 8,028,793 shares of common stock and warrants to purchase 44,485 shares of common stock held by Glenn Holdings, L.P. Mr. Glenn is the General Partner of Glenn Holdings, and as such has voting and investment control over the shares held by Glenn Holdings.

(9) Consists of (i) 220,000 shares of common stock held directly by Mr. LaRue, including 151,250 shares subject to repurchase by Oncternal, and (ii) 136,677 shares of common stock and warrants to purchase 3,834 shares of common stock held by a family trust (the “LaRue Trust”). Mr. LaRue and his wife, Joyce LaRue, are the trustees of the LaRue Trust, and in such capacity have joint power to vote and dispose of the shares held by the LaRue Trust.

PRINCIPAL STOCKHOLDERS OF COMBINED ORGANIZATION

Except where specifically noted, the following information does not give effect to the GTx Reverse Stock Split described in GTx Proposal No. 2.

The following table and the related notes present certain information with respect to the beneficial ownership of the common stock of the combined organization upon consummation of the merger, assuming the closing of the merger occurred on March 31, 2019, by:

- each director and named executive officer of the combined organization's;
- all of the combined organization's directors and executive officers as a group; and
- each person or group who is known to the management of Oncternal or GTx to become the beneficial owner of more than 5% of the common stock of the combined organization upon the consummation of the merger.

Unless otherwise indicated in the footnotes to this table, Oncternal and GTx believe that each of the persons named in this table have sole voting and investment power with respect to the shares indicated as beneficially owned.

The following table assumes an exchange ratio of 0.4474 and that the closing of the merger occurred on March 31, 2019. Immediately prior to the merger and after the conversion of Oncternal preferred stock in Oncternal common stock, GTx will have 24,207,270 shares of common stock outstanding and Oncternal will have 162,317,356 shares of common stock outstanding, after giving effect to the conversion of the outstanding Oncternal preferred stock. Upon the closing of the merger, the 162,317,356 shares of Oncternal's common stock will be converted into the right to receive an aggregate of 72,621,820 shares of GTx's common stock, there will be a total of 96,829,080 shares of GTx's common stock outstanding upon the closing of the merger. The following table does not give effect to the GTx Reverse Stock Split to be implemented prior to the closing of the merger. Shares of GTx's common stock that may be acquired by an individual or group within 60 days of March 31,2019, pursuant to the exercise of options or warrants, are deemed to be outstanding for the purpose of computing the percentage ownership of such individual or group, but are not deemed to be outstanding for the purpose of computing the percentage ownership of GTx's common stock of any other person shown in the table.

5% Stockholders	Number of Shares	Approximate Percent Owned
Shanghai Pharmaceutical (USA) Inc.(1)	15,211,600	15.7%
J. R. Hyde, III(3)	10,010,446	10.0%
Entities affiliated with MagnaSci Ventures(2)	8,689,499	8.9%
The Pyramid Peak Foundation(4)	7,183,900	7.4%

Directors and Named Executive Officers	Number of Shares	Approximate Percent Owned
James B. Breitmeyer, M.D., Ph.D.(5)	2,423,312	2.5%
Richard G. Vincent(6)	311,568	*
Hazel M. Aker(7)	57,551	*
Michael G. Carter, M.D., Ch.B., F.R.C.P.(8)	39,131	*
David F. Hale(9)	4,395,893	4.5%
Daniel L. Kisner, M.D.	—	*
Yanjun Liu, M.D., Ph.D.	—	*
Xin Nakanishi, Ph.D.	—	*
William LaRue(10)	161,292	*
Charles Theuer	89,480	*
Robert J. Wills, Ph.D.(11)	150,678	*
All current executive officers and directors as a group (10 persons)	7,628,905	7.9%

* Represents beneficial ownership of less than 1% of the shares of common stock.

(1) SPH USA is a wholly-owned subsidiary of SPH. The board of directors of SPH has voting and investment power over the shares held by SPH USA, and consists of Zhou Jun, Cho Man, Li Yongzhong, Shen Bo, Li An, Wan Kam To, Tse Cho Che, Cai Jiangnan and Hong Liang. Directors Yanjun Liu, M.D., Ph.D. and Xin Nakanishi, Ph.D. are affiliated with SPH but do not have voting or investment power over the shares held by SPH USA. The registered address of SPH USA is Two Penn Center Plaza, Suite 200, 1500 John F. Kennedy Blvd., Philadelphia, PA 19102.

(2) Consists of (i) 4,230,415 shares of common stock and warrants to purchase 634,562 shares of common stock held by MagnaSci Fund, L.P., (ii) 1,093,644 shares of common stock and warrants to purchase 164,046 shares of common stock held by MagnaSci Fund II, L.P. and (iii) 2,232,028 shares of common stock and warrants to purchase 334,804 shares of common stock held by MagnaSci Co-Investments, L.L.C. MagnaSci GP, L.L.C. is the sole general partner of MagnaSci Fund and MagnaSci Fund II. Cooper Collins is a Manager of MagnaSci GP and MagnaSci Co-Investments, and has voting and investment power over the shares held by MagnaSci Fund, MagnaSci Fund II and MagnaSci Co-Investments. The address of MagnaSci Fund, MagnaSci Fund II and MagnaSci Co-Investments is 123 N. Post Oak Lane, Suite 410, Houston, Texas 77024.

(3) Includes 14,535 shares held by Pittco Associates III, L.P. and 391,571 shares held by Pittco Investments, L.P., entities controlled by Mr. Hyde, 2,454,483 shares issuable upon exercise of a warrant issued to Mr. Hyde in November 2014 (the “2014 Warrant”), 678,349 shares issuable upon exercise of a warrant issued to Mr. Hyde in September 2017 (the “2017 Warrant”), and 70,276 shares issuable to Mr. Hyde pursuant to our Directors’ Deferred Compensation Plan. Mr. Hyde also has shared voting and dispositive power over 21,646 shares held by Mr. Hyde’s spouse, 184,480 shares held by trusts for the benefit of Mr. Hyde’s children (the “Hyde Family Trusts”). As trustee of the Hyde Family Trusts , John H. Pontius shares voting and dispositive power over all of the shares held by the Hyde Family Trusts.

(4) Based on information provided to GTx as of February 28, 2019. Includes an aggregate of 2,793,657 shares issuable upon exercise of outstanding warrants. James R. Boyd, Lee B. Harper, O. Mason Hawkins and Andrew R. McCarroll are each a director of the Foundation. Each of such individuals may be deemed to share beneficial ownership of the shares beneficially owned by the Foundation. The foregoing ownership information was provided to us as of February 28, 2019, and, consequently, beneficial ownership may have changed between such date and March 31, 2019.

(5) Consists of (i) 1,558,229 shares of common stock held directly by Dr. Breitmeyer, (ii) 715,840 shares of common stock underlying options held by Dr. Breitmeyer that are exercisable as of March 31, 2019 or that will become exercisable within 60 days after such date, (iii) 131,346 shares of common stock and warrants to purchase 4,474 shares of common stock held by the Breitmeyer Trust, (iv) 4,474 shares of common stock held by Dr. Breitmeyer as custodian for his child and (v) 8,948 shares of common stock underlying options held by Dr. Breitmeyer’s wife, Mary Breitmeyer, that are exercisable as of March 31, 2019 or that will become exercisable within 60 days after such date. Dr. Breitmeyer and Ms. Breitmeyer are the trustees of the Breitmeyer Trust, and in such capacity have joint power to vote and dispose of the shares held by the Breitmeyer Trust.

(6) Consists of (i) 248,708 shares of common stock held directly by Mr. Vincent, including 141,160 shares subject to repurchase by Oncternal and (ii) 61,144 shares of common stock and warrants to purchase 1,715 shares of common stock held by the Vincent Trust. Mr. Vincent and his wife, Stacy Vincent, are the trustees of the Vincent Trust, and in such capacity have joint power to vote and dispose of the shares held by the Vincent Trust.

(7) Consists of (i) 26,119 shares of common stock held directly by Ms. Aker and (ii) 30,574 shares of common stock and warrants to purchase 857 shares of common stock held by the Aker Trust. Ms. Aker and her husband, Larry Aker, are the trustees of the Aker Trust, and in such capacity have joint power to vote and dispose of the shares held by the Aker Trust

(8) Consists of 35,500 shares of common stock issuable upon the exercise of options held by Dr. Carter, and 3,631 shares issuable to Dr. Carter pursuant to our Directors’ Deferred Compensation Plan.

(9) Consists of (i) 4,263,969 shares of common stock and warrants to purchase 20,074 shares of common stock held by Hale BioPharma Ventures, LLC and (ii) 111,850 shares of common stock held by Hale Trading

Company. Mr. Hale is the Chairman and Chief Executive Officer of Hale BioPharma Ventures and the Managing Director of Hale Trading Company, and as such has voting and investment control over the shares held by Hale BioPharma Ventures and Hale Trading Company. Amounts also include 15,659 shares that were pledged as collateral by Hale BioPharma Ventures in favor of Oxford Finance LLC on one loan.

(10) Consists of (i) 98,428 shares of common stock held directly by Mr. LaRue, including 67,669 shares subject to repurchase by Oncternal, and (ii) 61,149 shares of common stock and warrants to purchase 1,715 shares of common stock held by the LaRue Trust. Mr. LaRue and his wife, Joyce LaRue, are the trustees of the LaRue Trust, and in such capacity have joint power to vote and dispose of the shares held by the LaRue Trust.

(11) Includes 13,334 shares of common stock issuable upon the exercise of options held by Dr. Wills.

LEGAL MATTERS

Cooley LLP will pass on the validity of GTx's common stock offered by this proxy statement/prospectus/information statement. The material U.S. federal income tax consequences of the merger will be passed upon for GTx by Cooley LLP, and for Oncternal by Latham & Watkins LLP.

EXPERTS

The financial statements of GTx, Inc. at December 31, 2018 and 2017 and for each of the three years in the period ended December 31, 2018, included in the Proxy Statement of GTx, Inc., which is referred to and made a part of this Prospectus and Registration Statement have been audited by Ernst & Young LLP, independent registered public accounting firm, as set forth in their report thereon appearing elsewhere herein, and are included in reliance upon such report given on the authority of such firm as experts in accounting and auditing.

The financial statements of Oncternal Therapeutics, Inc. as of December 31, 2018 and 2017 and for each of the two years in the period ended December 31, 2018, included herein in reliance upon the report of BDO USA, LLP, an independent registered public accounting firm (the report on the financial statements contains an explanatory paragraph regarding our ability to continue as a going concern), given on the authority of said firm as experts in accounting and auditing.

WHERE YOU CAN FIND MORE INFORMATION

GTx files annual, quarterly and special reports, proxy statements and other information with the SEC. You may read and copy any reports, statements or other information that GTx files at the SEC public reference rooms in Washington, D.C.; New York, New York; and Chicago, Illinois. Please call the SEC at 1-800-SEC-0330 for further information on the public reference rooms. GTx SEC filings are also available to the public from commercial document retrieval services and on the website maintained by the SEC at http://www.sec.gov. Reports, proxy statements and other information concerning GTx also may be inspected at the offices of the National Association of Securities Dealers, Inc., Listing Section, 1735 K Street, Washington, D.C. 20006.

As of the date of this proxy statement/prospectus/information statement, GTx has filed a registration statement on Form S-4 to register with the SEC GTx's common stock that GTx will issue to Oncternal's stockholders in the merger. This proxy statement/prospectus/information statement is a part of that registration statement and constitutes a prospectus of GTx, as well as a proxy statement of GTx for its special meeting and an information statement for the purpose of Oncternal for its written consent.

GTx has supplied all information contained in this proxy statement/prospectus/information statement relating to GTx, and Oncternal has supplied all information contained in this proxy statement/prospectus/information statement relating to Oncternal.

If you would like to request documents from GTx or Oncternal, please send a request in writing or by telephone to either GTx or Oncternal at the following addresses:

GTx, Inc.
17 W Pontotoc Ave., Suite 100
Memphis, TN 38103
Telephone: (901) 523-9700
Attn: Chief Legal Officer

Oncternal Therapeutics, Inc.
11750 Sorrento Valley Road, Suite 250
San Diego, CA 92121
Telephone: (858) 434-1113
Attn: Chief Financial Officer

TRADEMARK NOTICE

“GTx” is a registered and unregistered trademark of GTx in the United States and other jurisdictions. “Oncternal,” the Oncternal logo and other trademarks, service marks, and trade names of Oncternal are registered and unregistered marks of Oncternal Therapeutics, Inc. Other third-party logos and product/trade names are registered trademarks or trade names of their respective companies.

OTHER MATTERS

Section 16(a) Beneficial Ownership Reporting Compliance

Section 16(a) of the Exchange Act requires GTx's officers and directors, and persons who own more than 10% of a registered class of GTx's equity securities, to file reports of ownership and changes in ownership with the SEC. Such officers, directors and 10% stockholders are also required by SEC rules to furnish GTx with copies of all forms that they file pursuant to Section 16(a). Based on GTx's review of the copies of such forms received by it and written representations from such executive officers, directors and stockholders, GTx believes that during fiscal 2018, its executive officers, directors and 10% stockholders complied with all applicable Section 16(a) filing requirements.

Copies of such filings can be found at GTx's corporate website at *www.gtxinc.com* under "Investors" at "SEC Filings."

Stockholder Proposals

Requirements for Stockholder Proposals to Be Considered for Inclusion in GTx's Proxy Materials. Stockholders of GTx may submit proposals on matters appropriate for stockholder action at meetings of GTx's stockholders in accordance with Rule 14a-8 promulgated under the Exchange Act. For such proposals to be included in GTx's proxy materials relating to the 2020 Annual Meeting of Stockholders, all applicable requirements of Rule 14a-8 must be satisfied and such proposals must be received at GTx's executive offices no later than , 2020. However, if the GTx 2020 Annual Meeting of Stockholders is not held between , 2020 and , 2020, then the deadline will be a reasonable time prior to the time GTx begins to print and send its proxy materials. All such proposals must comply with all applicable requirements of Rule 14a-8 and be sent to the GTx Corporate Secretary at GTx, Inc., 17 W Pontotoc Ave., Suite 100, Memphis, Tennessee 38103 by the close of business on the required deadline.

Requirements for Stockholder Proposals and Director Nominations at the 2020 Annual Meeting. Pursuant to GTx's amended and restated bylaws (the "GTx bylaws"), stockholders wishing to submit proposals or director nominations, except in the case of proposals made in accordance with Rule 14a-8, must, in addition to complying with applicable laws and regulations and the requirements of the GTx bylaws, provide timely notice thereof in writing to the GTx Corporate Secretary. To be timely for the 2020 annual meeting of stockholders, you must notify the GTx Corporate Secretary, in writing, not later than the close of business on , 2020, nor earlier than the close of business on , 2020. GTx also advises you to review its bylaws, which contain additional requirements about advance notice of stockholder proposals and director nominations, including the different notice submission date requirements in the event that GTx does not hold its 2020 Annual Meeting of Stockholders between , 2020 and , 2020. A stockholder's notice to the GTx Corporate Secretary must set forth the information required by its bylaws with respect to each director nominee or proposal the stockholder proposes to bring before the annual meeting. The chairman of the 2020 annual meeting of stockholders may determine, if the facts warrant, that a matter has not been properly brought before the meeting and, therefore, may not be considered at the meeting. A copy of the GTx bylaws may be obtained by writing to the GTx Corporate Secretary at the address listed above. In addition, the proxy solicited by the GTx board of directors for the 2020 annual meeting of stockholders will confer discretionary voting authority with respect to (i) any proposal presented by a stockholder at that meeting for which GTx has not been provided with timely notice and (ii) any proposal made in accordance with GTx's bylaws, if the proxy statement for the 2020 annual meeting of stockholders briefly describes the matter and how management proxy holders intend to vote on it, if the stockholder does not comply with the requirements of Rule 14a-4(c)(2) promulgated under the Exchange Act.

Stockholder Nomination Policy

It is the GTx Nominating and Corporate Governance Committee's policy to review and consider all candidates for nomination and election as directors who may be suggested by any director or executive officer of GTx. The

GTx Nominating and Corporate Governance Committee will also consider any director candidate recommended by any stockholder if the recommendation is made in accordance with GTx's charter, bylaws and applicable law although no director candidate has been recommended to date by any stockholder, other than members of the GTx board of directors and management who are also stockholders of GTx. To be considered, a recommendation for director nomination should be submitted in writing to: GTx, Inc., Nominating and Corporate Governance Committee, Attention: Corporate Secretary, 17 W Pontotoc Ave., Suite 100, Memphis, Tennessee 38103. When submitting candidates for nomination to be elected at GTx's annual meetings of stockholders, stockholders must follow the notice procedures and provide the information required by GTx's bylaws. In particular, for the GTx Nominating and Corporate Governance Committee to consider a candidate recommended by a stockholder for nomination at the 2020 Annual Meeting, the recommendation must be delivered to GTx's Corporate Secretary, in writing, not later than the close of business on , 2020, nor earlier than the close of business on , 2020, subject to the different notice submission date requirements provided for in GTx's bylaws in the event that GTx does not hold its 2020 annual meeting between , 2020 and , 2020. The recommendation must include the same information as is specified in GTx's bylaws for stockholder nominees to be considered at an annual meeting, including the following:

- the stockholder's name and address and the beneficial owner, if any, on whose behalf the nomination is proposed;
- the class and number of shares of GTx that are owned beneficially and of record by such stockholder and such beneficial owner;
- a description of all arrangements or understandings between the stockholder and the proposed nominee and any other person or persons regarding the nomination;
- the nominee's written consent to being named in GTx's proxy statement as a nominee and to serving as a director if elected; and
- all information regarding the nominee that would be required to be included in GTx's proxy statement by the rules of the SEC, including the nominee's age, business experience for the past five years and any directorships held by the nominee during the past five years.

Code of Business Conduct and Ethics and Guidelines on Governance Issues

The GTx Board has adopted a Code of Business Conduct and Ethics applicable to all officers, directors and employees as well as Guidelines on Governance Issues. These documents are available on GTx's website (www.gtxinc.com) under "Investors" at "Corporate Governance." GTx will provide a copy of these documents to any stockholder, without charge, upon request, by writing to: GTx, Inc., Corporate Secretary, 17 W Pontotoc Ave., Suite 100, Memphis, Tennessee 38103. GTx intends to satisfy the disclosure requirement under Item 5.05 of Form 8-K regarding an amendment to, or waiver from, a provision of the Code of Business Conduct and Ethics by posting such information on its website at the address and the locations specified above.

Communications with the GTx Board

Stockholders and other interested parties may communicate in writing with the GTx Board, any of its committees, or with any of its non-management directors by sending written communications addressed to: GTx, Inc., Attention: Corporate Secretary, 17 W Pontotoc Ave., Suite 100, Memphis, Tennessee 38103. The GTx Corporate Secretary will review each communication and will forward such communication to the board of directors or to any individual director to whom the communication is addressed unless the communication is unduly hostile, threatening or similarly inappropriate, in which case, the GTx Corporate Secretary will discard the communication.

Policies on Reporting Certain Concerns Regarding Accounting and Other Matters

GTx has adopted policies on the reporting of concerns to GTx's Compliance Officer and GTx Audit Committee regarding any suspected misconduct, illegal activities or fraud, including any questionable accounting, internal

accounting controls or auditing matters, or misconduct. Any person who has a concern regarding any misconduct by any GTx employee, including any GTx officer, or any agent of GTx, may submit that concern to: GTx, Inc., Attention: Compliance Officer, 17 W Pontotoc Ave., Suite 100, Memphis, Tennessee 38103. Employees may communicate all concerns regarding any misconduct to the GTx Compliance Officer and/or the GTx Audit Committee on a confidential and anonymous basis through GTx's "whistleblower" hotline, the compliance communication phone number established by GTx: 1-877-778-5463, or by filing an anonymous, confidential report through Report-it.com, a web-based online service for "whistleblower" communications accessed at www.reportit.net. Any communications received through the toll free number or the online service is promptly reported to GTx's Compliance Officer, as well as other appropriate persons within GTx.

GTx, Inc.

INDEX TO FINANCIAL STATEMENTS

MANAGEMENT'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING

We, as management of GTx, Inc., are responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Securities Exchange Act Rule 13a-15(f). Internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with United States generally accepted accounting principles. Any system of internal control, no matter how well designed, has inherent limitations, including the possibility that a control can be circumvented or overridden and misstatements due to error or fraud may occur and not be detected. Also, because of changes in conditions, internal control effectiveness may vary over time. Accordingly, even an effective system of internal control will provide only reasonable assurance that the objectives of the internal control system are met.

Under the supervision and with the participation of management, including our principal executive officer and principal financial officer, we conducted an evaluation of the effectiveness of our internal control over financial reporting as of December 31, 2018 using the criteria for effective internal control over financial reporting as described in "Internal Control – Integrated Framework," issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework). Based on this evaluation, we concluded that, as of December 31, 2018, our internal control over financial reporting was effective. The effectiveness of our internal control over financial reporting has been audited by Ernst & Young LLP, independent registered public accounting firm who also audited the Company's financial statements included in this Annual Report on Form 10-K. Ernst & Young LLP's report on the Company's internal control over financial reporting is included in this Annual Report on the 10-K.

/s/ Marc S. Hanover
Marc S. Hanover
Chief Executive Officer
Principal Executive Officer

/s/ Jason T. Shackelford
Jason T. Shackelford
Vice President, Finance and Accounting
Principal Financial and Accounting Officer

Memphis, Tennessee
March 18, 2019

Report of Independent Registered Public Accounting Firm

The Board of Directors and Stockholders of GTx, Inc.

Opinion on the Financial Statements

We have audited the accompanying balance sheets of GTx, Inc. as of December 31, 2018 and 2017, the related statements of operations, stockholders' equity and cash flows for each of the three years in the period ended December 31, 2018, and the related notes (collectively referred to as the "financial statements"). In our opinion, the financial statements present fairly, in all material respects, the financial position of GTx, Inc. at December 31, 2018 and 2017, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2018, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) and our report dated March 18, 2019 expressed an unqualified opinion thereon.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ Ernst & Young LLP

We have served as the Company's auditor since 1998.

Memphis, Tennessee
March 18, 2019

GTx, Inc.
BALANCE SHEETS
(in thousands, except share and per share data)

	December 31, 2018	December 31, 2017
ASSETS		
Current assets:		
Cash and cash equivalents	$ 28,258	$ 15,816
Short-term investments	200	28,083
Prepaid expenses and other current assets	2,750	2,178
Total current assets	31,208	46,077
Property and equipment, net	19	51
Intangible assets, net	94	108
Total assets	$ 31,321	$ 46,236
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$ 3,279	$ 2,604
Accrued expenses and other current liabilities	1,931	5,371
Total current liabilities	5,210	7,975
Commitments and contingencies		
Stockholders' equity:		
Common stock, $0.001 par value: 60,000,000 shares authorized at December 31, 2018 and December 31, 2017; 24,051,844 and 21,541,909 shares issued and outstanding at December 31, 2018 and December 31, 2017, respectively	24	22
Additional paid-in capital	626,142	599,876
Accumulated deficit	(600,055)	(561,637)
Total stockholders' equity	26,111	38,261
Total liabilities and stockholders' equity	$ 31,321	$ 46,236

The accompanying notes are an integral part of these financial statements.

GTx, Inc.
STATEMENTS OF OPERATIONS
(in thousands, except share and per share data)

	Years Ended December 31,		
	2018	2017	2016
Expenses:			
Research and development expenses	$ 29,669	$ 21,467	$ 17,228
General and administrative expenses	9,390	9,188	8,705
Total expenses	39,059	30,655	25,933
Loss from operations	(39,059)	(30,655)	(25,933)
Other income, net	641	216	46
Gain on change in fair value of warrant liability	—	—	8,163
Net loss	$ (38,418)	$ (30,439)	$ (17,724)
Net loss per share:			
Basic and Diluted	$ (1.65)	$ (1.75)	$ (1.22)
Weighted average shares outstanding:			
Basic and Diluted	23,346,231	17,441,280	14,559,541

The accompanying notes are an integral part of these financial statements.

GTx, Inc.
STATEMENTS OF STOCKHOLDERS' EQUITY
For the Years Ended December 31, 2018, 2017 and 2016
(in thousands, except share data)

	Stockholders' Equity				
	Common Stock		Additional Paid-in Capital	Accumulated Deficit	Total Stockholders' Equity
	Shares	Amount			
Balances at January 1, 2016	14,037,411	$ 14	$515,319	$ (513,474)	$ 1,859
Issuance of common stock in October 2016 registered direct offering, net of offering costs	1,728,395	2	13,690	—	13,692
Vesting of restricted stock units, net of shares withheld for tax payments	154,170	—	(208)	—	(208)
Directors' deferred compensation	—	—	132	—	132
Share-based compensation	—	—	2,957	—	2,957
Warrant liability reclassification	—	—	19,186	—	19,186
Settlement of fractional shares upon reverse stock split	(404)	—	(3)	—	(3)
Net loss	—	—	—	(17,724)	(17,724)
Balances at December 31, 2016	15,919,572	16	551,073	(531,198)	19,891
Issuance of common stock and warrants in September 2017 private placement, net of offering costs	5,483,320	6	45,642	—	45,648
Vesting of restricted stock units, net of shares withheld for tax payments	139,017	—	(156)	—	(156)
Directors' deferred compensation	—	—	166	—	166
Share-based compensation	—	—	3,151	—	3,151
Net loss	—	—	—	(30,439)	(30,439)
Balances at December 31, 2017	21,541,909	22	599,876	(561,637)	38,261
Issuance of common stock upon exercise of warrants	674,579	1	(1)	—	—
Exercise of stock options	6,000	—	103	—	103
Issuance of shares under "At-The-Market" sales agreement, net of issuance costs	1,501,501	1	24,473	—	24,474
Vesting of restricted stock units, net of shares withheld for tax payments	327,855	—	(672)	—	(672)
Directors' deferred compensation	—	—	166	—	166
Share-based compensation	—	—	2,197	—	2,197
Net loss	—	—	—	(38,418)	(38,418)
Balances at December 31, 2018	24,051,844	$ 24	$626,142	$ (600,055)	$ 26,111

The accompanying notes are an integral part of these financial statements.

GTx, Inc.
STATEMENTS OF CASH FLOWS
(in thousands)

	Years Ended December 31,		
	2018	2017	2016
Cash flows from operating activities:			
Net loss	$(38,418)	$(30,439)	$(17,724)
Adjustments to reconcile net loss to net cash used in operating activities:			
Gain on change in fair value of warrant liability	—	—	(8,163)
Share-based compensation	2,197	3,151	2,957
Directors' deferred compensation	166	166	132
Depreciation and amortization	46	47	28
Changes in assets and liabilities:			
Prepaid expenses and other assets	(572)	251	204
Accounts payable	675	1,384	838
Accrued expenses and other liabilities	(3,440)	1,980	950
Net cash used in operating activities	(39,346)	(23,460)	(20,778)
Cash flows from investing activities:			
Purchase of property and equipment	—	(2)	(90)
Purchase of short-term investments, held to maturity	(44,155)	(39,283)	(35,404)
Proceeds from maturities of short-term investments, held to maturity	72,038	24,159	37,645
Net cash provided by (used in) investing activities	27,883	(15,126)	2,151
Cash flows from financing activities:			
Net proceeds from the issuance of common stock and warrants	24,474	45,648	13,692
Tax payments related to shares withheld for vested restricted stock units	(672)	(156)	(208)
Proceeds from exercise of employee stock options	103	—	—
Settlement of fractional shares upon reverse stock split	—	—	(3)
Net cash provided by financing activities	23,905	45,492	13,481
Net increase (decrease) in cash and cash equivalents	12,442	6,906	(5,146)
Cash and cash equivalents, beginning of period	15,816	8,910	14,056
Cash and cash equivalents, end of period	$ 28,258	$ 15,816	$ 8,910

The accompanying notes are an integral part of these financial statements.

GTx, Inc.
NOTES TO FINANCIAL STATEMENTS
(in thousands, except share and per share data)

1. Business

GTx, Inc. ("GTx" or the "Company"), a Delaware corporation incorporated on September 24, 1997 and headquartered in Memphis, Tennessee, is a biopharmaceutical company dedicated to the discovery, development and commercialization of medicines to treat serious and/or significant unmet medical conditions.

In 2015, the Company entered into an exclusive license agreement with the University of Tennessee Research Foundation ("UTRF") to develop UTRF's proprietary selective androgen receptor degrader ("SARD") technology which may have the potential to provide compounds that can degrade or antagonize multiple forms of androgen receptor to treat those patients who do not respond or are resistant to current androgen targeted therapies by inhibiting tumor growth in patients with progressive castration-resistant prostate cancer ("CRPC"). The Company is in the process of completing ongoing mechanistic preclinical studies in order to select the most appropriate SARD compounds to move forward into the additional preclinical studies required to submit an investigational new drug application ("IND"), and potentially advance one of its SARD compounds into a first-in-human clinical trial.

The Company had been developing selective androgen receptor modulators ("SARMs"), including enobosarm (GTx-024). Most recently, enobosarm was evaluated in post-menopausal women with stress urinary incontinence ("SUI") compared to placebo. During the third quarter of 2018, the Company announced that the Phase 2 double-blind, placebo-controlled clinical trial of orally-administered enobosarm (3 mg or 1 mg) in post-menopausal women with SUI (the "ASTRID trial") did not achieve statistical significance on the primary endpoint for the trial. The Company has completed the ASTRID trial, including its review of the full data sets from the clinical trial, and has determined that there is not a sufficient path forward to warrant additional clinical development of enobosarm to treat SUI. The Company has therefore discontinued further development of enobosarm to treat SUI, including discontinuing the related durability and open-label safety extension studies that the Company initiated before it received topline data from the ASTRID trial. The Company has also discontinued any further development of its SARM program generally.

Following the announcement of the ASTRID trial results, the Company's board of directors commenced a process of evaluating strategic alternatives to maximize stockholder value. To assist with this process, the Company's board of directors engaged a financial advisory firm to help explore the Company's available strategic alternatives, including possible mergers and business combinations, a sale of part or all of the Company's assets, and collaboration and licensing arrangements. On March 6, 2019, the Company and Oncternal Therapeutics Inc. ("Oncternal") announced the signing of an Agreement and Plan of Merger and Reorganization (the "Merger Agreement"). Upon the terms and subject to the satisfaction of the conditions described in the Merger Agreement, including approval of the transaction by the Company's stockholders and Oncternal's stockholders, a wholly-owned subsidiary of the Company will be merged with and into Oncternal (the "Merger"), with Oncternal surviving the Merger as a wholly-owned subsidiary of the Company. See Note 2, Significant Accounting Policies – Subsequent Events, for further discussion regarding the proposed Merger.

At December 31, 2018, the Company had cash, cash equivalents and short-term investments of $28,458 compared to $43,899 at December 31, 2017. To conserve its cash resources, the Company has substantially reduced its workforce since November 2018 and has ceased its SARM development activities and all other operations except for day-to-day business operations, completing ongoing mechanistic SARD preclinical studies and those activities necessary to complete the proposed Merger.

GTx, Inc.
NOTES TO FINANCIAL STATEMENTS
(in thousands, except share and per share data)

2. Significant Accounting Policies

Basis of Presentation

The accompanying financial statements have been prepared in accordance with U.S. generally accepted accounting principles ("U.S. GAAP"). Additionally, GTx operates in one business segment.

Use of Estimates

The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities at the date of the financial statements, and the reported amounts of revenues and expenses during the reporting period. Actual amounts and results could differ from those estimates.

Cash and Cash Equivalents

The Company considers highly liquid investments with initial maturities of three months or less to be cash equivalents.

Short-term Investments

At December 31, 2018 and 2017, short-term investments consisted of Federal Deposit Insurance Corporation ("FDIC") insured certificates of deposit with original maturities of greater than three months and less than one year.

Property and Equipment

Property and equipment is stated at cost. Amortization of leasehold improvements is recognized over the shorter of the estimated useful life of the leasehold improvement or the lease term. Depreciation is computed using the straight-line method over the estimated useful lives as follows:

Office equipment	3 to 5 years
Leasehold improvements	3 to 7 years
Furniture and fixtures	5 years
Computer equipment and software	3 years

Warrant Liability

In November 2014, the Company issued warrants to purchase 6,430,948 shares of its common stock. The Company classified these warrants as a liability on its balance sheet since the warrants contained certain terms that could have required the Company (or its successor) to purchase the warrants for cash in an amount equal to the value (as calculated utilizing a contractually-agreed Black-Scholes-Merton option pricing valuation model ("Black-Scholes Model")) of the unexercised portion of the warrants in connection with certain change of control transactions occurring on or prior to December 31, 2016, with such cash payment capped at an amount equal to $1.25 per unexercised share underlying each warrant. As a result of the provision of the warrants requiring cash settlement upon certain change of control transactions, the Company was required to account for these warrants as a liability at fair value and the estimated warrant liability was required to be revalued at each balance sheet date until the earlier of the exercise of the warrants, the modification to remove the provision that could require cash settlement upon certain change of control transactions or the expiration of such provision on December 31,

GTx, Inc.
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2016. Effective March 25, 2016, each of the warrants was amended by agreement of the warrant holders to remove the provision that could require cash settlement upon certain change of control transactions. These warrants were no longer accounted for as a liability as of March 31, 2016. The Company recorded a non-cash reclassification of the warrant fair value to stockholders' equity based on the warrants' fair value as of the March 25, 2016 modification date, with no further adjustments to the fair value of these warrants being required.

Fair Value of Financial Instruments and Warrant Liability

The carrying amounts of the Company's financial instruments (which include cash, cash equivalents, short-term investments, and accounts payable) and its prior warrant liability approximate their fair values. The fair value of the warrant liability was estimated using the Black-Scholes-Merton Model. See Note 6, Stockholders' Equity, for additional disclosure on the valuation methodology and significant assumptions. The Company's financial assets and liabilities are classified within a three-level fair value hierarchy that prioritizes the inputs used to measure fair value, which is defined as follows:

Level 1 — Quoted prices in active markets for identical assets or liabilities that the Company has the ability to access at the measurement date

Level 2 — Inputs other than quoted prices in active markets that are observable for the asset or liability, either directly or indirectly

Level 3 — Inputs that are unobservable for the asset or liability

As the Company has the positive intent and ability to hold its certificates of deposit classified as short-term investments until maturity, these investments have been classified as held to maturity investments and are stated at cost, which approximates fair value. The Company considers these to be Level 2 investments as the fair values of these investments are determined using third-party pricing sources, which generally utilize observable inputs, such as interest rates and maturities of similar assets.

Concentration of Risk

Financial instruments that potentially subject the Company to a concentration of credit risk consist of cash and cash equivalents and short-term investments. The Company has established guidelines relating to diversification and maturities of its cash equivalents and short-term investments which are designed to manage risk. The Company's cash and cash equivalents consist of bank deposits, certificates of deposit, and money market mutual funds. Bank deposits may at times be in excess of FDIC insurance limits. The Company's short-term investments consist of FDIC insured certificates of deposit with original maturities of greater than three months and less than one year.

Research and Development Expenses

Research and development expenses include, but are not limited to, the Company's expenses for personnel, supplies, and facilities associated with research activities, screening and identification of product candidates, formulation and synthesis activities, manufacturing, preclinical studies, toxicology studies, clinical trials, regulatory and medical affairs activities, quality assurance activities and license fees. The Company expenses these costs in the period in which they are incurred. The Company estimates its liabilities for research and development expenses in order to match the recognition of expenses to the period in which the actual services are received. As such, accrued liabilities related to third party research and development activities are recognized based upon the Company's estimate of services received and degree of completion of the services in accordance with the specific third party contract.

GTx, Inc.
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Patent Costs

The Company expenses patent costs, including legal expenses, in the period in which they are incurred. Patent expenses are included in general and administrative expenses in the Company's statements of operations.

Income Taxes

The Company accounts for deferred taxes by recognition of deferred tax assets and liabilities for the expected future tax consequences of events that have been included in the financial statements or tax returns. Under this method, deferred tax assets and liabilities are determined based on the difference between the financial statement and tax basis of assets and liabilities using enacted tax rates in effect for the year in which the differences are expected to reverse. A valuation allowance is provided when it is more likely than not that some portion or all of the deferred tax assets will not be realized. Accordingly, at December 31, 2018 and December 31, 2017, net of the valuation allowance, the net deferred tax assets were reduced to zero. See Note 8, *Income Taxes*, for further discussion.

Share-Based Compensation

The Company has stock option and equity incentive plans that provide for the purchase or acquisition of the Company's common stock by certain of the Company's employees and non-employees. The Company recognizes compensation expense for its share-based payments based on the fair value of the awards over the period during which an employee or non-employee is required to provide service in exchange for the award. See Note 3, *Share-Based Compensation*, for further discussion.

Other Income (Expense), Net

Other income (expense), net consists of interest earned on the Company's cash, cash equivalents and short-term investments, foreign currency transaction gains and losses, and other non-operating income or expense.

Basic and Diluted Net Loss Per Share

Basic and diluted net income (loss) per share attributable to common stockholders is calculated based on the weighted average number of common shares outstanding during the period. Diluted net income (loss) per share gives effect to the dilutive potential of common stock consisting of stock options, unvested RSUs and common stock warrants.

Weighted average potential shares of common stock of 11,191,431, 9,438,236, and 8,162,347 were excluded from the calculation of diluted net loss per share for the years ended December 31, 2018, 2017 and 2016, respectively, as inclusion of the potential shares would have had an anti-dilutive effect on the net loss per share for the periods. At December 31, 2018, the Company had 24,051,844 shares of common stock outstanding.

Comprehensive Loss

For all periods presented, there were no differences between net loss and comprehensive loss.

Recent Accounting Pronouncements

In February 2016, the Financial Accounting Standards Board issued Accounting Standard Update ("ASU") 2016-02, *Leases (Topic 842).* This ASU requires that lessees recognize assets and liabilities on the balance sheet

GTx, Inc.
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for the present value of the rights and obligations created by all leases with terms of more than 12 months. The ASU also will require disclosures designed to give financial statement users information on the amount, timing, and uncertainty of cash flows arising from leases. This new guidance will be effective for the Company as of January 1, 2019. The Company does not expect the adoption of the standard update to have a significant impact on its financial position or results of operations.

Subsequent Events

The Company has evaluated all events or transactions that occurred after December 31, 2018 up through the date the financial statements were issued. Other than as set forth below, there were no material recognizable or nonrecognizable subsequent events during the period evaluated.

Merger Agreement with Oncternal and Related Matters

Merger Agreement

On March 6, 2019, the Company entered into the Merger Agreement with Oncternal and Grizzly Merger Sub, Inc., a wholly-owned subsidiary of the Company ("Merger Sub"). Upon the terms and subject to the satisfaction of the conditions described in the Merger Agreement, including approval of the transaction by the Company's stockholders and Oncternal's stockholders, Merger Sub will be merged with and into Oncternal, with Oncternal surviving the Merger as a wholly-owned subsidiary of the Company.

Subject to the terms and conditions of the Merger Agreement, at the effective time of the Merger (the "Effective Time"): (i) each share of Oncternal common stock outstanding immediately prior to the Effective Time (excluding shares held by the Company, Merger Sub or Oncternal and dissenting shares) will be converted solely into the right to receive a number of shares of the Company's common stock (the "Shares") equal to the exchange ratio described below, (ii) each outstanding Oncternal stock option will be assumed by the Company, and (iii) each outstanding Oncternal warrant will be assumed by the Company.

Under the exchange ratio formula in the Merger Agreement, the former Oncternal stockholders immediately before the Merger are expected to own approximately 75% of the outstanding capital stock of the Company, and the stockholders of the Company immediately before the Merger are expected to own approximately 25% of the outstanding capital stock of the Company, subject to certain assumptions. The exchange ratio formula excludes Oncternal's outstanding stock options and warrants and the Company's outstanding stock options and warrants.

Under certain circumstances further described in the Merger Agreement, the ownership percentages may be adjusted upward or downward based on cash levels of the respective companies at the closing of the Merger (the "Closing").

The Merger Agreement contains customary representations, warranties and covenants made by the Company and Oncternal, including covenants relating to obtaining the requisite approvals of the stockholders of the Company and Oncternal, indemnification of directors and officers, the Company's and Oncternal's conduct of their respective businesses between the date of signing of the Merger Agreement and the Closing. The Closing is subject to satisfaction or waiver of certain conditions included in the Merger Agreement.

GTx, Inc.
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Following the Closing, Oncternal's Chief Executive Officer, Chief Financial Officer, and Chief Operating Officer will serve in these positions for the Company. Additionally, following the Closing, the Company's board of directors will consist of nine directors, including two current GTx board members.

The Merger Agreement also includes termination provisions for both the Company and Oncternal. In connection with a termination of the Merger Agreement under specified circumstances, either party may be required to pay the other party a termination fee ranging between $500 to $2,000.

Contingent Value Rights Agreement

At the Effective Time, the Company will enter into a Contingent Value Rights Agreement (the "CVR Agreement"). Pursuant to the CVR Agreement, for each share of the Company's common stock held, the Company's stockholders of record as of immediately prior to the Effective Time will receive one contingent value right ("CVR") entitling such holders to receive in the aggregate 50% of any net proceeds received during the 15-year period after closing from the grant, sale or transfer of rights to the Company's SARD or SARM technology that occurs during the 10-year period after the Closing (or in the 11th year if based on a term sheet approved during the initial 10-year period) and, if applicable, to receive royalties on the sale of any SARD products by the combined company during the 15-year period after Closing. The CVR Agreement will be effective prior to the Closing and will continue in effect until the payment of all amounts payable thereunder, unless terminated upon termination of the Merger Agreement.

Workforce Reduction

In the first quarter of 2019, due to the entry into the Merger Agreement with Oncternal, the Company's board of directors committed to reducing its workforce by seven employees. All employees affected by the workforce reduction will be eligible to receive, among other things, specified severance payments based on the applicable employee's level and years of service with the Company and the continuation of group health insurance coverage. In addition, the affected employees will also be eligible for full vesting acceleration of their outstanding stock options as well as an extension of the post-termination exercise period for their outstanding stock options.

As a result of the workforce reduction and prior termination of three employees earlier in the first quarter of 2019, the Company estimates that it will incur total severance-related charges for these employees of approximately $1,000 in the first quarter of 2019 and up to an additional $500 contingent upon the closing of the Merger. The Company does not expect to record a non-cash charge related to the modification of outstanding stock options in connection with the workforce reduction.

Termination of Directors' Deferred Compensation Plan

Prior to the Effective Time (but in no event more than 30 days prior to the Effective Time), the Company's board of directors will take all actions necessary to terminate and liquidate the Company's 2018 Amended and Restated Directors' Deferred Compensation Plan (the "Directors' Deferred Compensation Plan") and all rights or other deferrals thereunder effective immediately prior to the Effective Time, subject to the consummation of the Merger. Any future board compensation under the Directors' Deferred Compensation Plan on or after January 3, 2019 shall be settled only in cash.

3. Share-Based Compensation

Share-based payments include stock option and RSU grants under the Company's stock option and equity incentive plans and deferred compensation arrangements for the Company's non-employee directors.

GTx, Inc.
NOTES TO FINANCIAL STATEMENTS
(in thousands, except share and per share data)

The Company has granted to employees and non-employees options to purchase common stock under various plans at prices equal to the fair market value of its common stock on the dates the options are granted as determined in accordance with the terms of the applicable plan. The options have a term of ten years from the grant date and generally vest over three years from the grant date for director and non-employee options and over periods of up to five years from the grant date for employee options. Under the terms of the Company's stock option and equity incentive plans, employees generally have three months after the employment relationship ends to exercise all vested options except in the case of voluntary retirement, disability or death, where post-termination exercise periods are generally longer. The Company issues new shares of common stock upon the exercise of options. The Company estimates the fair value of stock option awards as of the date of the grant by applying the Black-Scholes Model. The application of this valuation model involves assumptions that are judgmental and highly sensitive in the determination of compensation expense.

The fair value of each stock option is amortized into compensation expense on a straight-line basis between the grant date for the award and each vesting date. During 2017, the Company adopted the Financial Accounting Standards Board Accounting Standards Update 2016-09, *Improvements to Employee Share Based Payment Accounting*. This guidance addresses the income tax effects of stock-based payments and eliminates the windfall pool concept, as all of the tax effects related to stock-based payments are now being recorded at settlement (or expiration) through the income statement. The new guidance also permits entities to make an accounting policy election for the impact of forfeitures on the recognition of expense for stock-based payment awards, allowing for forfeitures to be estimated or recognized when they occur. The Company elected to prospectively adopt the policy that forfeitures be recorded when they occur and prior periods have not been adjusted. The adoption of this guidance did not have a material impact on the Company's financial position or results of operations.

Additionally, the Company periodically grants RSUs to its employees. The Company estimates the fair value of RSUs using the closing price of its common stock on the grant date. The fair value of the RSUs is amortized on a straight-line basis over the requisite service period of the awards. All RSUs were fully vested at December 31, 2018.

The following table summarizes share-based compensation expense included within the statements of operations for each of the three years in the period ended December 31, 2018:

	Years Ended December 31,		
	2018	2017	2016
Research and development expenses	$ 807	$1,171	$1,260
General and administrative expenses	1,556	2,146	1,829
Total share-based compensation	$2,363	$3,317	$3,089

Share-based compensation expense recorded in the statement of operations as general and administrative expense for the years ended December 31, 2018, 2017 and 2016 included share-based compensation expense related to deferred compensation arrangements for the Company's non-employee directors of $166, $166 and $132, respectively. See Note 9, *Directors' Deferred Compensation Plan*, for further discussion of deferred compensation arrangements for the Company's non-employee directors.

For the years ended December 31, 2018, 2017 and 2016, the weighted average grant date fair value per share of stock options granted was $10.36, $3.80 and $5.45, respectively. The key assumptions used in

GTx, Inc.
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determining the grant date fair value of options granted in 2018, 2017 and 2016, and a summary of the methodology applied to develop each assumption is as follows:

	Years Ended December 31,		
	2018	2017	2016
Expected price volatility	93.1%	88.6%	91.3%
Risk-free interest rate	2.4%	2.2%	2.0%
Weighted average expected life in years	6.9 years	6.9 years	6.9 years
Dividend yield	0%	0%	0%

Expected Price Volatility — This is a measure of the amount by which a price has fluctuated or is expected to fluctuate. The Company based its determination of expected volatility on its historical stock price volatility. An increase in the expected price volatility will increase compensation expense.

Risk-Free Interest Rate — This is determined using U.S. Treasury rates where the term is consistent with the expected life of the stock options. An increase in the risk-free interest rate will increase compensation expense.

Expected Life — This is the period of time over which the options granted are expected to remain outstanding and is determined by calculating the average of the vesting term and the contractual term of the options. The Company has utilized this method due to the lack of historical option exercise information related to the Company's stock option and equity incentive plans. Options granted have a maximum term of ten years. An increase in the expected life will increase compensation expense.

Dividend Yield — The Company has not made any dividend payments nor does it have plans to pay dividends in the foreseeable future. An increase in the dividend yield will decrease compensation expense.

The following is a summary of stock option transactions for all of the Company's stock option and equity incentive plans for the three year period ended December 31, 2018:

	Number of Shares	Weighted Average Exercise Price Per Share
Options outstanding at January 1, 2016	798,309	$ 38.80
Options granted	363,500	6.94
Options forfeited or expired	(71,829)	54.65
Options exercised	—	—
Options outstanding at December 31, 2016	1,089,980	27.13
Options granted	977,350	4.97
Options forfeited or expired	(166,834)	48.71
Options exercised	—	—
Options outstanding at December 31, 2017	1,900,496	13.84
Options granted	472,000	13.32
Options forfeited or expired	(31,049)	168.76
Options exercised	(6,000)	17.23
Options outstanding and vested or expected to vest at December 31, 2018	2,335,447	$ 11.67

GTx, Inc.
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The following table summarizes information about stock options outstanding at December 31, 2018:

Options Outstanding			Options Exercisable		
Exercise Price	Number Outstanding	Weighted Average Remaining Contractual Life (years)	Weighted Average Exercise Price	Number Exercisable	Weighted Average Exercise Price
$4.29 — $4.29	56,250	8.36	$ 4.29	18,750	$ 4.29
$4.71 — $4.71	825,000	8.02	4.71	22,500	4.71
$4.77 — $12.71	826,800	7.67	9.97	134,404	8.25
$12.95 — $108.90	627,397	4.20	23.71	508,691	25.59
	2,335,447	6.88	11.67	684,345	20.91

At December 31, 2018, the aggregate intrinsic value of all outstanding options was zero with a weighted average remaining contractual term of 6.88 years. Of the Company's outstanding options, 684,345 options were exercisable and had a weighted average remaining contractual term of 4.05 years and no aggregate intrinsic value. Additionally, the Company's vested and expected to vest options had a weighted average remaining contractual term of 6.88 years and no aggregate intrinsic value.

Options to purchase 6,000 shares were exercised during the years ended December 31, 2018. The total intrinsic value of options exercised during the years ended December 31, 2018 was $39. At December 31, 2018, the total compensation cost related to non-vested options not yet recognized was $7,697, with a weighted average expense recognition period of 2.95 years. Shares available for future issuance under the Company's stock option and equity incentive plans were 1,167,162 at December 31, 2018. On January 1, 2019, shares available for future issuance under the 2013 equity incentive plan and the 2013 non-employee director equity incentive plan increased by an aggregate of 1,012,074 shares in accordance with the automatic increase provisions of such plans.

The following is a summary of the RSU transactions for all of the Company's equity incentive plans for the three year period ended December 31, 2018:

	Number of Shares
Nonvested RSUs outstanding at January 1, 2016	820,000
RSUs granted	11,000
RSUs vested	(184,001)
RSUs forfeited	(62,000)
Nonvested RSUs outstanding at December 31, 2016	584,999
RSUs granted	—
RSUs vested	(168,499)
RSUs forfeited	(36,000)
Nonvested RSUs outstanding at December 31, 2017	380,500
RSUs granted	—
RSUs vested	(380,500)
RSUs forfeited	—
Nonvested RSUs outstanding at December 31, 2018	—

GTx, Inc.
NOTES TO FINANCIAL STATEMENTS
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The number of RSUs vested during 2018, 2017, and 2016 included 52,645, 29,482, and 29,829 shares, respectively, that were withheld on behalf of the Company's employees to satisfy the statutory tax withholding requirements.

4. Property and Equipment, Net

Property and equipment, net consisted of the following:

	December 31,	
	2018	2017
Computer equipment and software	$ 1,225	$ 1,299
Furniture and fixtures	853	853
Leasehold improvements	355	355
Office equipment	211	211
	2,644	2,718
Less: accumulated depreciation	(2,625)	(2,667)
	$ 19	$ 51

Depreciation and amortization expense for the years ended December 31, 2018, 2017 and 2016 was $32, $32, and $14, respectively. Of these amounts, $1, $2 and $2, respectively, were included in research and development expenses in the statements of operations.

5. Accrued Expenses and Other Current Liabilities

Accrued expenses and other current liabilities consisted of the following:

	December 31,	
	2018	2017
Clinical trials	$1,492	$4,742
General and administrative	101	314
Research and development	272	312
Employee compensation	66	3
	$1,931	$5,371

6. Stockholders' Equity

Authorized Capital

On December 5, 2016, the Company filed a Certificate of Amendment to the Company's Restated Certificate of Incorporation with the Secretary of State of the State of Delaware to effect a one-for-ten reverse stock split of its outstanding common stock and to effect a reduction in the number of authorized shares of common stock from 400,000,000 to 60,000,000 shares. The Company's certificate of incorporation currently authorizes the Company to issue 60,000,000 shares of common stock, $0.001 par value per share, and 5,000,000 shares of preferred stock, $0.001 par value per share.

Common Stock

On February 9, 2018, the Company entered into an At-the-Market Equity Offering Sales Agreement (the "ATM Sales Agreement") with Stifel, Nicolaus & Company, Incorporated, as sales agent ("Stifel"), pursuant to

GTx, Inc.
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which the Company may offer and sell, from time to time, through Stifel, shares of the Company's common stock, having an aggregate offering price of up to $50,000. On May 16, 2018, the Company sold 1,501,501 shares of common stock under the ATM Sales Agreement for net proceeds of $24,474. As of December 31, 2018, the Company had approximately $25,000 of common stock remaining available to be sold under the ATM Sales Agreement.

On September 29, 2017, the Company completed a private placement of units consisting of an aggregate of 5,483,320 shares of common stock and warrants to purchase an aggregate of 3,289,988 shares of its common stock for net proceeds of $45,648, after deducting placement agent fees and other offering expenses. The purchasers in the private placement consisted solely of accredited investors that included certain institutional and existing stockholders, including a member of the Company's board of directors. The warrants, which have five year terms expiring on September 29, 2022, are immediately exercisable and have a per share exercise price of $9.02. The Company assessed whether the warrants require accounting as derivatives. The Company determined that the warrants were indexed to the Company's own stock. As such, the Company has concluded the warrants meet the scope exception for determining whether the instruments require accounting as derivatives and are classified in stockholders' equity. The fair value of the warrants was estimated at $21,069 using the Black-Scholes Model with the following assumptions: expected volatility of 97%, risk free interest rate of 1.92%, expected life of five years and no dividends. The net proceeds from the private placement were allocated to the common stock and warrants based upon their relative fair values.

On October 14, 2016, the Company completed a registered direct offering of its common stock. Under the terms of the offering, the Company sold 1,728,395 shares of its common stock for net proceeds of $13,692, after deducting offering expenses.

On November 14, 2014, the Company completed a private placement of units consisting of an aggregate of 6,431,111 shares of common stock and warrants to purchase an aggregate of 6,430,948 shares of its common stock for net proceeds of $42,814, after deducting offering expenses. The net proceeds from the private placement were allocated to the common stock and warrants based upon the fair value method. Similarly, the offering expenses were allocated between the common stock and warrants with the portion allocated to common stock offset against the proceeds allocated to stockholders' equity, whereas the portion allocated to the warrants was expensed immediately. The warrants have a per share exercise price of $8.50, became exercisable on May 6, 2015 and will continue to be exercisable for four years thereafter. Prior to May 6, 2015, each warrant was subject to net cash settlement if, at the time of any exercise, there was then an insufficient number of authorized and reserved shares of common stock to effect a share settlement of the warrant. Under the terms of the warrants, as of May 6, 2015, the net cash settlement feature of the warrants automatically became inoperative; accordingly, the warrants are exercisable only for shares of the Company's common stock. The warrants, however, also contained certain terms that could have required the Company (or its successor) to purchase the warrants for cash in an amount equal to the value (as calculated utilizing a contractually-agreed Black-Scholes Model) of the unexercised portion of the warrants in connection with certain change of control transactions occurring on or prior to December 31, 2016, with the cash payment capped at an amount equal to $1.25 per unexercised share underlying each warrant. Due to the provision of the warrants that could have required cash settlement upon certain change of control transactions, the Company was required to account for these warrants as a liability at fair value using the Black-Scholes Model and the estimated warrant liability was required to be revalued at each balance sheet date until the earlier of the exercise of the warrants, the modification to remove the provision that could require cash settlement upon certain change of control transactions or the expiration of such provision on December 31, 2016. Effective March 25, 2016, each of the warrants was amended by agreement of the warrant holders to remove the provision that could require cash settlement upon certain change of control transactions. These warrants were no longer accounted for as a liability at March 31, 2016. The Company recorded a non-cash

reclassification of the warrant fair value to stockholders' equity based on the warrants' fair value as of the March 25, 2016 modification date, with no further adjustments to the fair value of these warrants being required. In March 2018, certain holders of warrants issued in November 2014 exercised warrants covering 1,111,082 shares of common stock in a cashless exercise for which the Company issued an aggregate of 674,579 shares of common stock upon exercise.

Each of these completed offerings included certain existing GTx stockholders and/or certain members of the GTx management team and/or board of directors.

7. License Agreements

University of Tennessee Research Foundation License Agreements

The Company and the University of Tennessee Research Foundation ("UTRF") are parties to a consolidated, amended and restated license agreement (the "SARM License Agreement") pursuant to which the Company has been granted exclusive worldwide rights in all existing SARM technologies owned or controlled by UTRF, including all improvements thereto, and exclusive rights to future SARM technology that may be developed by certain scientists at the University of Tennessee or subsequently licensed to UTRF under certain existing inter-institutional agreements with The Ohio State University. Under the SARM License Agreement, the Company is obligated to pay UTRF annual license maintenance fees, low single-digit royalties on net sales of products and mid single-digit royalties on sublicense revenues.

In accordance with the terms of the SARM License Agreement that the Company entered into with UTRF in July 2007, the Company paid a one-time up-front fee of $290, which was recorded as an intangible asset by the Company. This intangible asset, net at December 31, 2018 and 2017 was $94 and $108, respectively.

The Company and UTRF also entered into a license agreement in March 2015 pursuant to which the Company was granted exclusive worldwide rights in all existing SARD technologies owned or controlled by UTRF, including all improvements thereto (the "SARD License Agreement"). Under the SARD License Agreement, the Company is obligated to employ active, diligent efforts to conduct preclinical research and development activities for the SARD program to advance one or more lead compounds into clinical development. The Company is also obligated to pay UTRF annual license maintenance fees, low single-digit royalties on net sales of products and additional royalties on sublicense revenues, depending on the state of development of a clinical product candidate at the time it is sublicensed.

8. Income Taxes

The Tax Cuts and Jobs Act ("Tax Reform Act") was enacted on December 22, 2017. The Tax Reform Act significantly revised the U.S. corporate income tax regime by, among other things, lowering the U.S. corporate tax rate from 35% to 21% effective January 1, 2018. On December 22, 2017, the SEC staff issued Staff Accounting Bulletin No. 118 ("SAB 118") to address the application of U.S. GAAP in situations when a registrant does not have the necessary information available, prepared, or analyzed (including computations) in reasonable detail to complete the accounting for certain income tax effects of the Tax Reform Act. The Company recognized the provisional tax impacts related to the revaluation of deferred tax assets and liabilities and included these amounts in its financial statements for the year ended December 31, 2017. During 2018 the Company completed the accounting under the Tax Reform Act as allowed under SAB 118 to revalue its deferred tax assets and liabilities which resulted in no change to the amounts previously recorded by the Company for year ended December 31, 2017.

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Deferred income taxes reflect the net tax effects of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes. The principal components of the Company's net deferred income tax assets and liabilities consisted of the following:

	December 31,	
	2018	2017
Deferred income tax assets:		
Net federal and state operating loss carryforwards	$ 120,555	$ 110,145
Research and development credits	16,383	14,757
Share-based compensation	3,130	3,994
Depreciation and amortization	17	21
Total deferred tax assets	140,085	128,917
Deferred income tax liabilities:		
Other	461	92
Total deferred tax liabilities	461	92
Net deferred tax assets	139,624	128,825
Valuation allowance	(139,624)	(128,825)
	$ —	$ —

Realization of deferred income tax assets is dependent upon future earnings, if any, the timing and amount of which are uncertain. Accordingly, due to the Company's history of net operating losses, the net deferred tax assets have been fully offset by a valuation allowance. The valuation allowance increased by $10,799 in 2018, decreased by $47,132 in 2017 and increased in 2016 by $9,347. The valuation allowance decrease in 2017 was due primarily to the passage of the Tax Reform Act and the reduction in the valuation of the Company's net deferred tax assets as a result of the lowering of the corporate tax rate from 35% to 21% effective January 1, 2018.

At December 31, 2018, the Company had net federal operating loss carryforwards of approximately $472,054. The federal operating loss carryforwards originating prior to 2018 will expire from 2019 to 2037 if not utilized. The Company had state operating loss carryforwards of approximately $411,396, which expire from 2019 to 2038 if not utilized. The Company also had research and development credits at December 31, 2018 of approximately $16,383, which expire from 2020 to 2038 if not utilized.

The Company will recognize the impact of a tax position in the financial statements if that position is more likely than not of being sustained on audit based on the technical merits of the position. As of December 31, 2018, the Company had no unrecognized tax benefits. Utilization of the Company's net operating loss carryforwards may be subject to a substantial annual limitation due to ownership change limitations provided by Section 382 of the Internal Revenue Code of 1986, as amended, and similar state provisions. The annual limitations may result in the expiration of net operating loss carryforwards before utilization. The Company completed a study of its net operating losses through December 31, 2016 to determine whether such amounts are likely to be limited by Section 382. As a result of this study and its analysis of subsequent ownership changes, the Company does not currently believe any Section 382 limitation exists through December 31, 2018 though the Company has not yet conducted an in-depth analysis since the last study. However, any future ownership changes under Section 382 may limit the Company's ability to fully utilize these tax benefits. The Company has not yet conducted an in-depth study of its research and development credits, although the Company periodically reviews assumptions used in its

GTx, Inc.
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(in thousands, except share and per share data)

calculations to reflect its best estimate of expected credit. An in-depth study may result in an increase or decrease to the Company's research and development credits and until such study is conducted of the Company's research and development credits, no amounts are being presented as an uncertain tax position. The Company's net deferred income tax assets have been fully offset by a valuation allowance. Therefore, future changes to the Company's unrecognized tax benefits would be offset by an adjustment to the valuation allowance and there would be no impact on the Company's balance sheet, statement of operations, or cash flows. The Company does not expect its unrecognized tax benefits to change significantly over the next 12 months.

The Company is currently open to audit under the statute of limitations by the Internal Revenue Service and the appropriate state income taxing authorities for all years due to the net loss carryforwards from those years. The Company is currently not under examination by the Internal Revenue Service or any other taxing authorities. The Company has not recorded any interest and penalties on any unrecognized tax benefits since its inception.

9. Directors' Deferred Compensation Plan

Non-employee directors may defer all or a portion of their fees under the Company's Directors' Deferred Compensation Plan until termination of their status as directors. Deferrals can be made into a cash account, a stock account, or a combination of both. Stock accounts will be paid out in the form of Company common stock, except that any fractional shares will be paid out in cash valued at the then current market price of the Company's common stock. Cash accounts and stock accounts under the Directors' Deferred Compensation Plan are credited with interest or the value of any cash and stock dividends, respectively. Non-employee directors are fully vested in any amounts that they elect to defer under the Directors' Deferred Compensation Plan.

For the years ended December 31, 2018, 2017 and 2016, the Company incurred non-employee director fee expense of $291, $291 and $257, respectively, of which $166, $166 and $132 was deferred into stock accounts and will be paid in common stock following separation from service as a director. At December 31, 2018, 122,725 shares of the Company's common stock had been credited to individual director stock accounts under the Directors' Deferred Compensation Plan, and no amounts had been credited to individual director cash accounts under the Directors' Deferred Compensation Plan.

10. 401(k) Plan

The Company sponsors a 401(k) retirement savings plan that is available to all eligible employees. The plan is intended to qualify under Section 401(k) of the Internal Revenue Code of 1986, as amended. The plan provides that each participant may contribute up to a statutory limit of their pre-tax compensation which was $18.5 for employees under age 50 and $24.5 for employees 50 and older in calendar year 2018. Employee contributions are held in the employees' name and invested by the plan's trustee. The plan also permits the Company to make matching contributions, subject to established limits. The Company elected to match a portion of employee's contributions to the plan in the amount of $185, $186 and $200 in 2018, 2017 and 2016, respectively.

11. Commitments and Contingencies

Operating Lease Commitments

In 2015, the Company entered into a new office lease with respect to the Company's current office space. The new office lease term commenced on May 1, 2015 with a three year term ending on April 30, 2018, with an option to extend the lease for an additional three years, and was accounted for as an operating lease. In March 2018, the Company amended the lease to extend the term of the lease for an additional 12-month term expiring

GTx, Inc.
NOTES TO FINANCIAL STATEMENTS
(in thousands, except share and per share data)

on April 30, 2019. Total rent expense under the operating leases was approximately $509, $506 and $495 for the years ended December 31, 2018, 2017 and 2016, respectively. As of December 31, 2018, future annual minimum payments under operating lease arrangements were $162.

12. Quarterly Financial Data (Unaudited) (1)

The following is a summary of the quarterly results of operations for the years ended December 31, 2018 and 2017:

	2018 Quarters Ended			
	March 31	June 30	September 30	December 31
Expenses:				
Research and development expenses	$ 11,000	$ 7,962	$ 7,467	$ 3,240
General and administrative expenses	2,688	2,196	2,160	2,346
Total expenses	13,688	10,158	9,627	5,586
Loss from operations	(13,688)	(10,158)	(9,627)	(5,586)
Other income, net	131	143	196	171
Net loss	$ (13,557)	$ (10,015)	$ (9,431)	$ (5,415)
Net loss per share:				
Basic and Diluted	$ (0.62)	$ (0.43)	$ (0.39)	$ (0.23)
Weighted average shares outstanding:				
Basic and Diluted	21,967,805	23,288,691	24,045,992	24,051,844

	2017 Quarters Ended			
	March 31	June 30	September 30	December 31
Expenses:				
Research and development expenses	$ 4,193	$ 4,448	$ 5,914	$ 6,912
General and administrative expenses	2,087	1,997	2,617	2,487
Total expenses	6,280	6,445	8,531	9,399
Loss from operations	(6,280)	(6,445)	(8,531)	(9,399)
Other income, net	27	40	27	122
Net loss	$ (6,253)	$ (6,405)	$ (8,504)	$ (9,277)
Net loss per share:				
Basic and Diluted	$ (0.39)	$ (0.40)	$ (0.53)	$ (0.43)
Weighted average shares outstanding:				
Basic and Diluted	16,018,342	16,041,923	16,115,835	21,541,909

(1) The sum of quarterly earnings per share amounts may not equal the annual amounts as the quarterly amounts are computed independently for each quarter while the full year is based on the annual weighted average shares outstanding.

ONCTERNAL THERAPEUTICS, INC.

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REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Stockholders and the Board of Directors
Oncternal Therapeutics, Inc.
San Diego, California

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of Oncternal Therapeutics, Inc. and subsidiary (the "Company") as of December 31, 2018 and 2017, the related consolidated statements of operations, convertible preferred stock and stockholders' deficit, and cash flows for each of the two years in the period ended December 31, 2018, and the related notes (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2018 and 2017, and the results of its operations and its cash flows for each of the two years in the period ended December 31, 2018, in conformity with accounting principles generally accepted in the United States of America.

Going Concern Uncertainty

The accompanying consolidated financial statements have been prepared assuming that the Company will continue as a going concern. As described in Note 1 to the consolidated financial statements, the Company has suffered recurring losses from operations and has a net capital deficiency that raise substantial doubt about its ability to continue as a going concern. Management's plans in regard to these matters are also described in Note 1. The consolidated financial statements do not include any adjustments that might result from the outcome of this uncertainty.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's consolidated financial statements based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) ("PCAOB") and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB and in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audits we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion.

Our audits included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ BDO USA, LLP
We have served as the Company's auditor since 2016.
San Diego, California

April 5, 2019

Oncternal Therapeutics, Inc.
Consolidated Balance Sheets
(in thousands, except share and par value data)

	December 31, 2018	December 31, 2017
Assets		
Current assets:		
Cash and cash equivalents	$ 20,645	$ 10,188
Prepaid expenses and other assets	565	615
Total current assets	21,210	10,803
Other assets	752	266
Total assets	$ 21,962	$ 11,069
Liabilities, convertible preferred stock and stockholders' deficit		
Current liabilities:		
Accounts payable	$ 3,440	$ 1,113
Accrued liabilities	891	1,030
Deferred revenue	—	1,902
Convertible note payable	—	200
Total current liabilities	4,331	4,245
Warrant liability	674	1,387
Commitments and contingencies (Note 3)		
Convertible preferred stock, $0.0001 par value; authorized shares — 130,099,288 and 143,560,000 at December 31, 2018 and 2017, respectively; issued and outstanding shares — 111,034,576 and 77,034,576 at December 31, 2018 and 2017, respectively; liquidation preference — $48,954 and $31,954 at December 31, 2018 and 2017, respectively; net of stock subscriptions receivable of $0 and $1,100 at December 31, 2018 and 2017, respectively	46,588	28,715
Stockholders' deficit:		
Common stock, $0.0001 par value; authorized shares — 200,000,000 at December 31, 2018 and 2017; issued and outstanding shares — 51,257,780 and 51,032,780 at December 31, 2018 and 2017, respectively	5	5
Additional paid-in capital	1,748	1,522
Accumulated deficit	(31,384)	(24,805)
Total stockholders' deficit	(29,631)	(23,278)
Total liabilities, convertible preferred stock and stockholders' deficit	$ 21,962	$ 11,069

See accompanying notes.

Oncternal Therapeutics, Inc.
Consolidated Statements of Operations
(in thousands, except share and per share data)

	Years Ended December 31,	
	2018	2017
Grant revenue	$ 2,521	$ 1,674
Operating expenses:		
Research and development	8,287	9,363
General and administrative	1,820	2,871
Total operating expenses	10,107	12,234
Loss from operations	(7,586)	(10,560)
Other income (expense):		
Change in fair value of warrant liability	713	124
Other income	216	—
Interest income	79	10
Interest expense	(1)	(10)
Total other income (expense)	1,007	124
Net loss	$ (6,579)	$ (10,436)
Net loss per share, basic and diluted	$ (0.13)	$ (0.23)
Weighted-average shares of common stock outstanding, basic and diluted	48,930,354	45,914,263

See accompanying notes.

Oncternal Therapeutics, Inc.
Consolidated Statements of Convertible Preferred Stock and Stockholders' Deficit
(in thousands, except share data)

	Convertible Preferred Stock		Common Stock		Additional Paid-in Capital	Accumulated Deficit	Total Stockholders' Deficit
	Shares	Amount	Shares	Amount			
Balance at December 31, 2016	48,691,573	$18,825	50,216,845	$ 5	$ 1,308	$ (14,369)	$ (13,056)
Issuance of Series B convertible preferred stock and warrants for cash, net of issuance costs of $38	5,688,888	2,016	—	—	—	—	—
Issuance of Series B-2 convertible preferred stock and warrants for cash, net of issuance costs of $215, and stock subscriptions receivable of $1,100	22,654,115	7,874	—	—	—	—	—
Issuance of restricted common shares for cash, net of repurchases	—	—	47,025	—	2	—	2
Issuance of restricted common shares for services rendered, net of repurchases	—	—	916,981	—	81	—	81
Exercise of stock options for cash, net of repurchases	—	—	(148,071)	—	2	—	2
Vesting related to repurchase liability, net	—	—	—	—	(59)	—	(59)
Stock-based compensation	—	—	—	—	188	—	188
Net loss	—	—	—	—	—	(10,436)	(10,436)
Balance at December 31, 2017	77,034,576	28,715	51,032,780	5	1,522	(24,805)	(23,278)
Collection of stock subscription receivable	—	1,100	—	—	—	—	—
Issuance of Series C convertible preferred stock for cash, net of issuance costs of $227	34,000,000	16,773	—	—	—	—	—
Issuance of restricted common shares	—	—	200,000	—	10	—	10
Exercise of stock options for cash	—	—	25,000	—	1	—	1
Vesting related to repurchase liability, net	—	—	—	—	35	—	35
Stock-based compensation	—	—	—	—	180	—	180
Net loss	—	—	—	—	—	(6,579)	(6,579)
Balance at December 31, 2018	111,034,576	$46,588	51,257,780	$ 5	$ 1,748	$ (31,384)	$ (29,631)

See accompanying notes.

Oncternal Therapeutics, Inc.
Consolidated Statements of Cash Flows
(in thousands)

	Years Ended December 31,	
	2018	2017
Cash flows from operating activities		
Net loss	$ (6,579)	$ (10,436)
Adjustments to reconcile net loss to net cash used in operating activities:		
Stock-based compensation	180	188
Noncash compensation expense	10	81
Noncash interest expense	1	10
Change in fair value of warrant liability	(713)	(124)
Noncash other income	(216)	—
Changes in operating assets and liabilities:		
Prepaid expenses and other assets	(436)	(570)
Accounts payable and accrued liabilities	2,238	(186)
Deferred revenue	(1,902)	1,902
Net cash used in operating activities	(7,417)	(9,135)
Cash flows from financing activities		
Proceeds from issuances of convertible preferred stock, net	17,873	11,401
Proceeds from issuances of restricted common stock	—	2
Proceeds from early exercise of stock options, net of repurchases	1	2
Net cash provided by financing activities	17,874	11,405
Net increase in cash and cash equivalents	10,457	2,270
Cash and cash equivalents — beginning of year	10,188	7,918
Cash and cash equivalents — end of year	$20,645	$ 10,188
Supplemental disclosure of noncash financing activities		
Initial fair value of convertible preferred stock warrant issued to convertible preferred stock investors	$ —	$ 1,511
Issuance of note receivable for stock subscription for convertible preferred stock	$ —	$ 1,100

See accompanying notes.

Oncternal Therapeutics, Inc.
Notes to Consolidated Financial Statements

1. Description of Business, Basis of Presentation and Summary of Significant Accounting Policies

Description of Business

Oncternal Therapeutics, Inc. (the "Company") was incorporated in the state of Delaware in November 2013 and is based in San Diego, California. The Company is a clinical-stage biopharmaceutical company focused on developing first-in-class product candidates for cancers with critical unmet medical need. The Company's clinical pipeline consists of its lead program, cirmtuzumab, a humanized monoclonal antibody that binds to ROR1 (Receptor-tyrosine kinase-like Orphan Receptor 1), and TK216, a small molecule inhibiting the biological activity of ETS-family transcription factor oncoproteins targeting patients with Ewing sarcoma. The Company is also developing a CAR-T (chimeric antigen receptors T-cells) targeting ROR1.

Principles of Consolidation

The consolidated financial statements include the accounts of the Company and its wholly-owned subsidiary Oncternal, Inc. All intercompany accounts and transactions have been eliminated in the preparation of the consolidated financial statements.

Liquidity and Going Concern

From its inception through December 31, 2018, the Company has devoted substantially all of its efforts to organizational activities including raising capital, building infrastructure, acquiring assets, developing intellectual property, and conducting preclinical studies, clinical trials and product development activities. The Company has a limited operating history and the sales and income potential of the Company's business and market are unproven. The Company has experienced recurring net losses and negative cash flows from operating activities. At December 31, 2018, the Company had an accumulated deficit of $31.4 million and had cash and cash equivalents of $20.6 million. The Company will need to continue to raise a substantial amount of funds until it is able to generate revenues to fund its development activities. As a result, the Company believes that there is substantial doubt about its ability to continue as a going concern for one year after the date these consolidated financial statements are issued.

The determination as to whether the Company can continue as a going concern contemplates the realization of assets and the satisfaction of liabilities in the normal course of business. The Company expects to continue to incur net losses into the foreseeable future. Successful transition to attaining profitable operations is dependent upon achieving a level of revenues adequate to support the Company's cost structure. The Company has incurred net losses since inception and has relied on its ability to fund its operations through debt and equity financings and grant funding. These conditions raise substantial doubt about the Company's ability to continue as a going concern. The accompanying consolidated financial statements have been prepared assuming that the Company will continue as a going concern and do not include any adjustments that might result from the outcome of this uncertainty. This basis of accounting contemplates the recovery of the Company's assets and the satisfaction of liabilities in the normal course of business.

The Company believes that its existing cash and cash equivalents will be sufficient to fund its operations into the first quarter of 2020. The Company plans to continue to fund its losses from operations and capital funding needs through a combination of equity offerings, debt financings, government funding, or other sources, potentially including future government funding, collaborations, licenses and other similar arrangements (see Note 7). There can be no assurance that the Company will be able to obtain any sources of financing on acceptable terms, or at all. To the extent that the Company can raise additional funds by issuing equity securities, the Company's stockholders may experience significant dilution. Any debt financing, if available, may involve restrictive covenants that impact the Company's ability to conduct its business.

Oncternal Therapeutics, Inc.
Notes to Consolidated Financial Statements—(Continued)

Use of Estimates

The Company's consolidated financial statements are prepared in accordance with accounting principles generally accepted in the United States of America ("U.S. GAAP"). The preparation of the Company's consolidated financial statements and accompanying notes requires it to make estimates and assumptions that impact the reported amounts of assets, liabilities, revenues and expenses and the disclosure of contingent assets and liabilities. Significant estimates consist of those used to determine the fair value the Company's common and preferred stock, stock-based awards and warrant liability, and those used to determine grant revenue and accruals for research and development costs. Although these estimates are based on the Company's knowledge of current events and actions it may undertake in the future, actual results may ultimately materially differ from these estimates and assumptions.

Fair Value Measurements

The accounting guidance defines fair value, establishes a consistent framework for measuring fair value and expands disclosure for each major asset and liability category measured at fair value on either a recurring or non-recurring basis. Fair value is defined as an exit price, representing the amount that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants. As such, fair value is a market-based measurement that should be determined based on assumptions that market participants would use in pricing an asset or liability. As a basis for considering such assumptions, the accounting guidance establishes a three-tier fair value hierarchy, which prioritizes the inputs used in measuring fair value as follows:

Level 1: Observable inputs such as quoted prices in active markets.

Level 2: Inputs, other than the quoted prices in active markets that are observable either directly or indirectly.

Level 3: Unobservable inputs in which there is little or no market data, which require the reporting entity to develop its own assumptions.

The carrying amounts of the Company's current financial assets and liabilities are considered to be representative of their respective fair values because of the short-term nature of those instruments. The Company has no financial assets or liabilities, other than the warrant liability described below, measured at fair value on a recurring basis. No transfers between levels have occurred during the periods presented.

Liabilities measured at fair value on a recurring basis are as follows:

		Fair Value Measurements at Reporting Date Using:		
	Total	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
As of December 31, 2018:				
Warrant liability	$ 674,000	$ —	$ —	$ 674,000
As of December 31, 2017:				
Warrant liability	$1,387,000	$ —	$ —	$ 1,387,000

The preferred stock warrant liability is recorded at fair value utilizing the Black-Scholes option pricing model using significant unobservable inputs consistent with the inputs used for the Company's stock-based compensation expense adjusted for the preferred stock warrants' expected term and the fair value of the underlying preferred stock.

Oncternal Therapeutics, Inc.
Notes to Consolidated Financial Statements—(Continued)

The assumptions used in the Black-Scholes option pricing model to determine the fair value of the warrant liability were as follows:

	December 31,	
	2018	2017
Fair value of underlying preferred stock	$ 0.29	$ 0.45
Risk-free interest rate	2.37% — 2.69%	1.75% — 2.20%
Expected volatility	75.3% — 76.4%	77.9% — 85.0%
Expected term (in years)	3.7 — 4.0	4.7 — 5.0
Expected dividend yield	—	—

The following table provides a reconciliation of the warrant liability measured at fair value using Level 3 significant unobservable inputs:

	Warrant Liability
Balance at December 31, 2016	$ —
Fair value of warrants issued	1,511,000
Decrease in fair value of warrant liability	(124,000)
Balance at December 31, 2017	1,387,000
Decrease in fair value of warrant liability	(713,000)
Balance at December 31, 2018	$ 674,000

Cash and Cash Equivalents

The Company considers all highly liquid investments with maturities of three months or less when purchased to be cash equivalents. Cash and cash equivalents include cash in readily available checking accounts and money market accounts.

Concentrations of Credit Risk

Financial instruments that potentially subject the Company to significant concentrations of credit risk consist primarily of cash and cash equivalents. The Company maintains deposits in federally insured financial institutions in excess of federally insured limits. The Company has not experienced any losses in such accounts and believes it is not exposed to significant risk on its cash balances due to the financial position of the depository institution in which those deposits are held. Additionally, the Company established guidelines regarding approved investments and maturities of investments, which are designed to maintain safety and liquidity.

Patent Costs

Costs related to filing and pursuing patent applications are recorded as general and administrative expense and expensed as incurred since recoverability of such expenditures is uncertain.

Research and Development Expenses and Accruals

Research and development expenses consist of costs incurred for the Company's own and for sponsored and collaborative research and development activities. Research and development costs are expensed as incurred and

include manufacturing drug product, costs associated with preclinical studies and clinical trials, regulatory and medical affairs activities, quality assurance activities, salaries and benefits, including stock-based compensation, fees paid to third-party consultants, license fees and overhead.

The Company has entered into various research and development contracts with research institutions, clinical research organizations, clinical manufacturing organizations and other companies. Payments for these activities are based on the terms of the individual agreements, which may differ from the pattern of costs incurred, and payments made in advance of performance are reflected in the accompanying consolidated balance sheets as prepaid expenses and other or accrued liabilities. The Company records accruals for estimated costs incurred for ongoing research and development activities. When evaluating the adequacy of the accrued liabilities, the Company analyzes progress of the services, including the phase or completion of events, invoices received and contracted costs. Significant judgments and estimates may be made in determining the prepaid or accrued balances at the end of any reporting period. Actual results could differ from the Company's estimates.

Warrant Liability

The Company has issued freestanding warrants to purchase shares of its Series B-2 convertible preferred stock. Since the underlying Series B-2 convertible preferred stock is classified as temporary equity, the Series B-2 convertible preferred stock warrants are classified as a liability in the accompanying consolidated balance sheets. The Company adjusts the carrying value of such Series B-2 convertible preferred stock warrants to their estimated fair value at each reporting date, with any related increases or decreases in the fair value recorded as an increase or decrease to other income (expense) in the consolidated statements of operations. The warrant liability will continue to be adjusted to fair value until such time as the Series B-2 convertible preferred stock warrants are no longer outstanding or the underlying securities are no longer redeemable outside the control of the Company.

Revenue Recognition

The Company currently generates revenue from a research subaward agreement from the California Institute for Regenerative Medicine (see Note 4), which provides the Company with payments for certain types of expenditures in return for research and development activities over a contractually defined period. Revenue from such subaward is recognized in the period during which the related qualifying costs are incurred and services are rendered, provided that the applicable conditions under the subaward agreement have been met.

The subaward agreement is on a best-effort basis and does not require scientific achievement as a performance obligation. All fees received under the agreement are non-refundable. The costs associated with the agreement are expensed as incurred and reflected as a component of research and development expense in the accompanying consolidated statements of operations.

Funds received from the subaward agreement are recorded as revenue as the Company is the principal participant in the arrangement because the activities under the subaward are part of the Company's development programs. In those instances where the Company first receives consideration in advance of providing underlying services, the Company classifies such consideration as deferred revenue until (or as) the Company provides the underlying services. In those instances where the Company first provides the underlying services prior to its receipt of consideration, the consideration is recorded as a grant receivable. At December 31, 2018, the Company had a grant receivable of $0.1 million. At December 31, 2017, the Company had deferred revenue of $1.9 million. The Company considers the grant receivable to be fully collectible; accordingly, no allowance for doubtful amounts has been established.

Oncternal Therapeutics, Inc.
Notes to Consolidated Financial Statements—(Continued)

Stock-Based Compensation

Stock-based compensation expense represents the cost of the grant date fair value of equity awards recognized in the period using the Black-Scholes option pricing model. The Company recognizes expense for awards with graded vested schedules over the requisite service period of the awards (usually the vesting period) on a straight-line basis. For equity awards for which vesting is subject to performance-based milestones, the expense is recorded over the remaining service period after the point when the achievement of the milestone is probable or the performance condition has been achieved.

Income Taxes

The Company accounts for income taxes under the asset and liability method, which requires the recognition of deferred tax assets and liabilities for the expected future tax consequences of events that have been included in the financial statements. Under this method, deferred tax assets and liabilities are determined on the basis of the differences between the financial statements and tax basis of assets and liabilities using enacted tax rates in effect for the year in which the differences are expected to reverse. The effect of a change in tax rates on deferred tax assets and liabilities is recognized in income in the period that includes the enactment date.

The Company recognizes net deferred tax assets to the extent that the Company believes these assets are more likely than not to be realized. In making such a determination, management considers all available positive and negative evidence, including future reversals of existing taxable temporary differences, projected future taxable income, tax-planning strategies, and results of recent operations. If management determines that the Company would be able to realize its deferred tax assets in the future in excess of their net recorded amount, management would make an adjustment to the deferred tax asset valuation allowance, which would reduce the provision for income taxes.

Segment Reporting

Operating segments are identified as components of an enterprise about which separate discrete financial information is available for evaluation by the chief operating decision-maker in making decisions regarding resource allocation and assessing performance. The Company views its operations and manages its business in one operating segment operating in the United States.

Net Loss Per Share

Basic net loss per share is computed by dividing the net loss by the weighted-average number of common shares outstanding for the period, without consideration for potentially dilutive securities and adjusted for the weighted-average number of common shares outstanding that are subject to repurchase. The Company has excluded weighted-average shares subject to repurchase of 2,234,207 shares and 4,771,637 shares from the weighted-average number of common shares outstanding for the years ended December 31, 2018 and 2017, respectively. Diluted net loss per share is computed by dividing the net loss by the weighted-average number of shares of common stock and dilutive common stock equivalents outstanding for the period determined using the treasury-stock and if-converted methods. Dilutive common stock equivalents are comprised of convertible preferred stock, convertible preferred stock warrants, common stock subject to repurchase, and options outstanding under the Company’s stock option plan. For all periods presented, there is no difference in the number of shares used to calculate basic and diluted shares outstanding as inclusion of the potentially dilutive securities would be antidilutive.

Oncternal Therapeutics, Inc.
Notes to Consolidated Financial Statements—(Continued)

Potentially dilutive securities not included in the calculation of diluted net loss per share, because to do so would be anti-dilutive are as follows (in common stock equivalent shares):

	December 31,	
	2018	2017
Convertible preferred stock	111,034,576	77,034,576
Convertible preferred stock warrants	5,064,712	5,064,712
Common stock options	6,868,251	2,068,251
Common stock subject to repurchase	1,357,476	3,024,386
Total	124,325,015	87,191,925

Recently Issued Accounting Pronouncements

From time to time, new accounting pronouncements are issued by the Financial Accounting Standards Board ("FASB") or other standard setting bodies that are adopted by the Company as of the specified effective date. Unless otherwise discussed, the Company believes that the impact of recently issued standards that are not yet effective will not have a material impact on its consolidated financial position or results of operations upon adoption.

In February 2016, the FASB issued Accounting Standards Update ("ASU") 2016-02, *Leases*, which, for operating leases, requires a lessee to recognize a right-of-use asset and a lease liability, initially measured at the present value of the lease payments, in its balance sheet. The standard also requires a lessee to recognize a single lease cost, calculated so that the cost of the lease is allocated over the lease term, generally on a straight-line basis. This ASU is not applicable to the Company as of December 31, 2018 as its only lease is on a month to month basis and is not expected to be renewed for a period greater than one year.

Recently Adopted Accounting Pronouncements

In May 2014, the FASB issued ASU 2014-09, *Revenue from Contracts with Customers (Topic 606)* ("ASC 606"). ASC 606 is a comprehensive new revenue recognition model that requires a company to recognize revenue to depict the transfer of goods or services to a customer at an amount that reflects the consideration it expects to receive in exchange for those goods or services. In August 2015, the FASB issued ASU 2015-14, *Revenue from Contracts with Customers Deferral of Effective Date*, which deferred the original effective date of ASC 606 for all entities by one year. The Company adopted this standard on January 1, 2018 using the modified retrospective approach, the adoption of this standard had no impact on the consolidated financial statements as the Company currently has no marketed products or ongoing collaboration agreements, under which any participant is considered a customer, and its research subaward agreement is not within the scope of ASC 606.

In June 2018, the FASB issued ASU 2018-07, *Improvements to Nonemployee Share-Based Payment Accounting*, which supersedes most of the prior accounting guidance on nonemployee share-based payments, and instead aligns it with existing guidance on employee share-based payments in Topic 718, *Compensation — Stock Compensation*. As a result, nonemployee share-based payment transactions will be measured by estimating the fair value of the equity instruments that an entity is obligated to issue, and the measurement date will be consistent with the measurement date for employee share-based payment awards. Probability is to be considered on nonemployee awards with performance conditions. The classification will continue to be subject to the requirements of Topic 718, although cost recognition of nonemployee awards will remain unchanged. This guidance is effective for the fiscal years and interim reporting periods beginning after December 15, 2018 with early adoption permitted, but no earlier than an entity's adoption date of Topic 606, *Revenue from Contracts with Customers — Income Tax Implications*. The early adoption of this guidance, effective January 1, 2018, had no material impact on the Company's financial statements.

Oncternal Therapeutics, Inc.
Notes to Consolidated Financial Statements—(Continued)

2. Balance Sheet Details

Accrued liabilities consist of the following:

	December 31,	
	2018	2017
Research and development	$ 720,000	$ 469,000
Legal fees	20,000	341,000
Unvested share liability	54,000	89,000
Compensation	85,000	88,000
Other	12,000	43,000
	$ 891,000	$ 1,030,000

3. Commitments and Contingencies

Facility Lease

The Company leases its office space in San Diego, California on a month-to-month basis. Rent expense, net of sublease income, was $12,000 and $55,000 for the years ended December 31, 2018 and 2017, respectively.

Litigation

The Company is not a party to any litigation and does not have contingency reserves established for any litigation liabilities. At each reporting date, the Company evaluates whether or not a potential loss amount or a potential range of loss is probable and reasonably estimable under the provisions of the authoritative guidance that addresses accounting for contingencies.

Indemnification Agreements

In the ordinary course of business, the Company may provide indemnification of varying scope and terms to vendors, lessors, business partners and other parties with respect to certain matters including, but not limited to, losses arising out of breach of such agreements or from intellectual property infringement claims made by third parties. In addition, the Company has entered into indemnification agreements with members of its board of directors and its executive officers that will require the Company, among other things, to indemnify them against certain liabilities that may arise by reason of their status or service as directors or officers. The maximum potential amount of future payments the Company could be required to make under these indemnification agreements is, in many cases, unlimited. To date, the Company has not incurred any material costs as a result of such indemnification. The Company is not currently aware of any indemnification claims and has not accrued any liabilities related to such obligations in its consolidated financial statements as of December 31, 2018 or 2017.

4. License, Collaboration and Research Subaward Agreements

Georgetown University (“Georgetown”)

In March 2014, the Company entered into an Exclusive License Agreement (the “License Agreement”) with Georgetown, pursuant to which the Company: (i) licensed the exclusive worldwide right to patents and technologies for the development and commercialization of certain product candidates targeting EWS-FLI1 as an anti-tumor therapy for therapeutic, diagnostics, or research tool purposes, (ii) is solely responsible for all development and commercialization activities and costs, and (iii) is responsible for all costs related to the filing, prosecution and maintenance of the licensed patent rights.

Oncternal Therapeutics, Inc.
Notes to Consolidated Financial Statements—(Continued)

Under the terms of the License Agreement, commencing in 2015, the Company: (i) shall pay and has paid an annual license maintenance fee of $10,000 until the first commercial sale occurs, (ii) is required to make up to $200,000 in aggregate milestone payments upon the achievement of certain regulatory milestones, and (iii) will be required to pay low single digit royalties based on annual net product sales. The Company accounted for the licensed technology as an asset acquisition because it did not meet the definition of a business. All milestone payments under the License Agreement will be recognized as research and development expense upon completion of the required events, as the triggering events are not considered to be probable until they are achieved. As of December 31, 2018, the Company had not triggered or made any milestone payments under the License Agreement.

The License Agreement may be terminated by either party upon material breach or may be terminated by the Company as to one or more countries with 90 days written notice of termination. The term of the License Agreement will continue until the expiration of the last valid claim within the patent rights covering the product. Georgetown may terminate the agreement in the event (i) the Company fails to pay any amount and fails to cure such failure within 30 days after receipt of notice, (ii) the Company defaults in its obligation to obtain and maintain insurance and fails to remedy such breach within 60 days after receipt of notice, or (iii) the Company declares insolvency or bankruptcy. The Company may terminate the agreement at any time upon at least 60 days' written notice.

In 2017, the Company entered into a research agreement with Georgetown for up to $150,000. For the years ended December 31, 2018 and 2017, the Company recorded research and development expenses of $53,000 and $75,000, respectively.

The University of Texas MD Anderson Cancer Center ("MD Anderson")

In December 2014, the Company entered into a collaboration agreement (the "Collaboration") with MD Anderson, which, as amended, provides for the conduct of preclinical and clinical research for TK216 in exchange for certain program payments. If MD Anderson successfully completes all the requirements of the Collaboration in full and the program is successfully commercialized, the Company will be required to pay aggregate milestone payments of $1.0 million based on net product sales. For the years ended December 31, 2018 and 2017, the Company recorded $330,000 and $0, respectively, of research and development expenses earned by MD Anderson under the Collaboration agreement.

Agreements with the Regents of the University of California (the "Regents")

In March 2016, and as amended and restated in August 2018 in connection with the spin-off transaction described below, the Company entered into a license agreement (the "Regents license agreement") for the development, manufacturing and distribution rights related to the development and commercialization of ROR1 related naked antibodies, antibody fragments or synthetic antibodies, and genetically engineered cellular therapy. The Regents license agreement provides for the following: (i) in May 2016, an upfront license fee of $0.5 million was paid and 1,459,524 shares of common stock were issued, (ii) $25,000 in annual license maintenance fees commencing in 2017, (iii) reimbursement of up to $30,000 in annual patent costs, (iv) certain development and regulatory milestones aggregating from $10.0 million to $12.5 million, on a per product basis, (v) certain worldwide sales milestones based on achievement of tiered revenue levels aggregating $75.0 million, (vi) low single-digit royalties, including potential future minimum annual royalties, on net sales of each target, and (vii) minimum diligence to advance licensed assets consisting of at least $1.0 million in development spend annually through 2021. Under the Regents license agreement in 2018 and 2017, the Company recorded: (i) $25,000 in annual license maintenance fees recorded as research and development expense, and (ii) $0.1 million and $0.2 million in patent costs recorded as general and administrative expense for the years

ended December 31, 2018 and 2017, respectively. As of December 31, 2018, the Company believes it has met its obligations under the Regents license agreement.

In July 2016, and as modified by the amended and restated Regents license agreement in August 2018, the Company entered into a Research Agreement (the "Research Agreement") with the Regents for further research on a ROR1 therapeutic development program. Under this five-year agreement, the Regents will have an aggregate budget of $3.6 million, with $125,000 payable quarterly. For the years ended December 31, 2018 and 2017, the Company recorded $0.5 million and $1.0 million, respectively, in research and development costs under this Research Agreement. Such costs are includable as part of the Company's annual diligence obligations under the Regents license agreement.

The Regents license agreement will expire upon the later of the expiration date of the longest-lived patent rights or the 15th anniversary of the first commercial sale of a licensed product. The Regents may terminate the Regents license agreement if: (i) a material breach by the Company is not cured within a reasonable time, (ii) the Company files a claim asserting the Regents licensed patent rights are invalid or unenforceable, and (iii) the Company files for bankruptcy. The Company may terminate the agreement at any time upon at least 60 days' written notice.

In September 2016, the Company entered into an Investigator-Initiated Clinical Trial Agreement with the Regents to provide partial support for a Phase 1 clinical study to determine the safety and tolerability of cirmtuzumab for the treatment of patients with relapsed or refractory chronic lymphocytic leukemia ("CLL"). Under this agreement that was concluded in 2017, the Company recorded $0.2 million in research and development expenses for the year ended December 31, 2017.

Velos Biopharma Holdings, LLC ("VBH") and VelosBio, Inc. ("VelosBio") Spin-off Transactions

In November and December 2017, the Company formed VBH and made an in-kind tax-free distribution of 100% of its interest in VBH to the Company's stockholders, option holders and warrant holders of record. On February 6, 2018, the Company licensed and assigned its rights to two preclinical product candidates, previously under the Regents license agreement, to VBH. In consideration for the license, the Company: (i) received a promissory note receivable from VBH of $0.1 million, with an annual interest rate of 2.64% and a due date of 10 years, and (ii) made a partial assignment of its March 2016 Regents license agreement. Pursuant to the partial assignment, VBH assumed certain obligations related to the licensed Products under the Regents license agreement as follows: (i) reimbursement of certain historical and future patent costs related to the Products, (ii) certain development and sales milestones for advancing licensed Products targets, (iii) low single-digit royalties, including potential future minimum annual royalties, on net sales of each licensed Product target are to be allocated between the Company and VBH, (iv) certain third party agreements and related obligations specifically related to the licensed Products, (v) minimum diligence requirements to advance licensed assets consisting of a minimum of $0.5 million in development spend annually through 2021, and (vi) Research Agreement obligations equal to $0.5 million annually commencing January 1, 2018. Due to the high uncertainty of the success of VBH ever repaying the note receivable and associated interest, the Company has provided a full valuation allowance for these amounts as of December 31, 2018.

In December 2017, VelosBio was incorporated with VBH being its sole stockholder. On February 6, 2018, VBH sublicensed and assigned its intellectual property rights to its two preclinical product candidates to VelosBio. In consideration for the license, VelosBio agreed to use commercially reasonable efforts to develop the licensed products as well as the following payment obligations: (i) the assumption of each of the VBH assumed obligations under the partial assignment between the Company and VBH as outlined above, and (ii) certain tiered development milestone and royalty payments to VBH. In August 2018, the Company entered

into the amended and restated Regents license agreement and VelosBio entered into their own license agreement directly with the Regents. There is no common control overlap between the companies.

Also on February 6, 2018, the Company and VelosBio entered into: (i) an asset purchase agreement whereby VelosBio purchased the Company's right, title and interest in the Company's nominal assets related to the two preclinical product candidates and assumed the Company's $0.2 million convertible note payable and related $16,000 of accrued interest which has been recorded as other income, and (ii) a transition services agreement whereby the Company agreed to provide VelosBio with certain transition services, which expired as of December 31, 2018, as follows: (i) access to certain common laboratory equipment at the Company's lab facility, (ii) certain named employees were to devote up to 80% of their time supporting VelosBio related activities, (iii) cirmtuzumab manufacturing, process optimization and ancillary activities until VelosBio was able to establish their own, and (iv) agreement to cost share the purchase of certain antibody materials with VelosBio. Such services were to be provided at cost or cost plus. During 2018, the Company incurred $3.0 million of costs on behalf of VelosBio that were substantially reimbursed and recorded on a net basis within operating expenses in the accompanying consolidated statements of operations. As of December 31, 2018, there are no ongoing rights or commitments under the asset purchase or transition services agreements.

The California Institute for Regenerative Medicine ("CIRM") Award

In August 2017, CIRM awarded an $18.3 million grant to researchers at the University of California San Diego school of medicine ("UC San Diego"), to advance the Company's Phase 1b/2 clinical trial evaluating cirmtuzumab in combination with ibrutinib for the treatment of patients with B-cell lymphoid malignancies, including mantle cell lymphoma ("MCL") and CLL. The Company: (i) is conducting this study in collaboration with UC San Diego, (ii) estimates it will receive $16.1 million in development milestones under research subaward agreements throughout the award project period, estimated to be from October 1, 2017 to March 31, 2022, (iii) is committed to certain co-funding requirements, (iv) received subaward payments of $0.5 million and $3.6 million in December 2018 and 2017, respectively, and (v) is required to provide UC San Diego progress and financial update reports throughout the award project period. The subaward does not bear a royalty payment commitment, nor is the subaward otherwise refundable. For the years ended December 31, 2018 and 2017, the Company recorded revenue of $2.5 million and $1.7 million, respectively. Related qualifying subaward costs during the years ending December 31, 2018 and 2017 was $4.6 million and $3.1 million, respectively. As of December 31, 2018, the Company believes it has met its obligations under the CIRM award and UC San Diego subawards.

Clinical Trial and Supply Agreement

In April 2018, the Company entered into a Clinical Trial and Supply Agreement to supply ibrutinib for the Company's Phase 1b/2 clinical trial evaluating cirmtuzumab in combination with ibrutinib. Such agreement does not bear any upfront costs, inventory purchase costs, milestone or royalty payment commitments or other financial obligations.

License and Development Agreement with Shanghai Pharmaceutical (USA) Inc. ("SPH USA"), a Related Party

In November 2018, contemporaneous with the issuance of the Series C preferred stock (see Note 5), the Company entered into a License and Development Agreement ("LDA") with SPH USA for: (i) the territory of the People's Republic of China, Hong Kong, Macau, and Taiwan ("Greater China"), and (ii) rights to manufacture, develop, market, distribute and sell all of the Company's product candidates under the License Agreement and the Regents license agreement (exclusive to Greater China only). Under the LDA, SPH USA is

solely responsible for: (a) all preclinical and clinical development activities required in order to obtain regulatory approval in Greater China for such product candidates, (b) any third-party license milestone or royalty payments owed under the License Agreement and the Regents license agreement, and (c) paying the Company a low single digit royalty on net sales in the territory.

The LDA will expire upon the expiration of the last royalty term for the last licensed product. The LDA may be terminated by: (i) SPH USA on a country by country or product by product basis with 180 days written notice, (ii) either party upon material breach that is not cured within 90 days, and (iii) either party in the event the other party declares insolvency or bankruptcy.

5. Convertible Preferred Stock and Stockholders' Deficit

Convertible Preferred Stock

The Company's convertible preferred stock has been classified as temporary equity on the accompanying consolidated balance sheets in accordance with authoritative guidance for the classification and measurement of potentially redeemable securities whose redemption is based upon certain change in control events outside of the Company's control, including liquidation, sale or transfer of control of the Company. The Company has determined not to adjust the carrying values of the convertible preferred stock to the liquidation preferences of such shares because the occurrence of any such change of control event is not probable.

The authorized, issued and outstanding shares of convertible preferred stock as of December 31, 2018 consist of the following:

	Shares Authorized	Shares Issued and Outstanding	Liquidation Preference	Carrying Value
			(in thousands)	
Series A	13,560,000	13,560,000	$ 3,390	$ 3,357
Series B	6,750,721	6,750,721	3,038	2,891
Series B-2	61,788,567	56,723,855	25,526	23,567
Series C	48,000,000	34,000,000	17,000	16,773
Total	130,099,288	111,034,576	$ 48,954	$ 46,588

The authorized, issued and outstanding shares of convertible preferred stock as of December 31, 2017 consist of the following:

	Shares Authorized	Shares Issued and Outstanding	Liquidation Preference	Carrying Value
			(in thousands)	
Series A	13,560,000	13,560,000	$ 3,390	$ 3,357
Series B	55,000,000	6,750,721	3,038	2,891
Series B-2	75,000,000	56,723,855	25,526	22,467
Total	143,560,000	77,034,576	$ 31,954	$ 28,715

In January 2017, the Company issued 5,688,888 shares of Series B convertible preferred stock at a per share purchase price of $0.45, raising net cash proceeds of $2.5 million.

In September, November and December 2017, the Company issued an aggregate of 22,654,115 shares of Series B-2 preferred stock at a per share purchase price of $0.45, raising net cash proceeds of $8.9 million, of which $1.1 million was collected in February 2018 and, as such, was recorded as a stock subscription receivable within mezzanine equity at December 31, 2017.

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Notes to Consolidated Financial Statements—(Continued)

Contemporaneous with and as an inducement for existing or new preferred stockholders to participate in the first closing of the Series B-2 convertible preferred stock issuances in September 2017, the Company: (i) issued 3,398,045 warrants for the purchase of Series B-2 convertible preferred stock at an exercise price of $0.45 per share, (ii) converted 34,069,740 shares of Series B convertible preferred stock into an equal amount of Series B-2 convertible preferred stock for those existing investors that invested their pro rata amount of a minimum targeted raise of $5.6 million in the September 2017 closing (all members of the Company's board of directors and their affiliated funds purchased at least their pro rata amounts), and (iii) converted 1,666,667 warrants for the purchase of Series B convertible preferred stock into an equal amount of Series B-2 convertible preferred stock at the same exercise price of $0.45 per share. The converted Series B convertible preferred stock and Series B convertible preferred stock warrants were accounted for as a modification of such instruments in the accompanying consolidated financial statements.

In November 2018, contemporaneous with entering into the LDA, the Company issued 34,000,000 shares of Series C preferred stock to SPH USA, a related party, at a per share purchase price of $0.50, raising net cash proceeds of $16.8 million. The Company concluded that the shares were issued at fair value and therefore no value was ascribed to the LDA.

Description of Securities

Voting Rights

The holder of each share of Series C convertible preferred stock, Series B-2 convertible preferred stock, Series B convertible preferred stock and Series A convertible preferred stock (collectively, "Preferred Stock") is entitled to one vote for each share of common stock into which it would convert and to vote as one class with the common stockholders on all matters. Certain matters require the vote of 60% of the Preferred Stock, including amendment to the Company's certificate of incorporation and the declaration of dividends, and certain matters require the vote of 70% of the Series C convertible preferred stock, including any amendment to the rights and preferences of the Series C convertible preferred stock.

Dividends

The holders of the Series C convertible preferred stock are entitled to receive noncumulative dividends when, as and if declared by the board of directors, at the annual per share rate of $0.04. The Company may not declare, pay or set aside any cash dividends on share of any other class or series of capital stock unless the holders of Series C convertible preferred stock then outstanding receive a dividend in an amount at least equal to the greater of: (i) any declared but unpaid Series C convertible preferred stock dividends, and (ii) a proportionate share of any dividend declared on an as-converted to common stock basis or equivalent. In the event dividends are paid on any share of common stock, the Company shall pay an additional dividend on all outstanding shares of Preferred Stock in a per share amount equal to (on an as-if-converted to common stock basis) the amount paid or set aside for each share of common stock. No cash dividends have been declared as of December 31, 2018.

Liquidation

The Series C convertible preferred stock has a liquidation preference of $0.50 per share, plus any declared but unpaid dividends, in preference and priority to any other class or series of the Company's capital stock. Upon payment of the full liquidation preference of Series C holders, the holders of Series B-2 convertible preferred stock are entitled to receive their liquidation preference of $0.45 per share, plus any declared but unpaid dividends. Upon payment of the full liquidation preference of Series B-2 holders, the holders of Series B convertible preferred stock are entitled to receive their liquidation preference of $0.45 per share, plus any

declared but unpaid dividends. Upon payment of the full liquidation preference of Series B holders, the holders of Series A convertible preferred stock are entitled to receive their liquidation preference of $0.25 per share, plus any declared but unpaid dividends, prior to and in preference to any distribution of the assets of the Company to common stockholders. The remaining assets of the Company are to be distributed ratably among the holders of common stock and Preferred Stock on an as-converted to common stock basis until each share of Preferred Stock has received an aggregate distribution of three times its liquidation preference, at which time the remaining assets are to be distributed ratably among the holders of common stock.

Conversion

The shares of Preferred Stock are convertible into an equal number of shares of common stock, at the option of the holder, subject to certain anti-dilution adjustments. Each share of Preferred Stock is automatically converted into common stock, (A) at any time upon the affirmative election of the holders of at least a majority (or 70% in the case of Series C) of the outstanding shares of each respective series of Preferred Stock, or (B) on the day immediately preceding the effective date of a firmly underwritten public offering of the Company's common stock pursuant to a registration statement under the Securities Act of 1933, as amended, with respect to which the Company receives gross proceeds of at least $40.0 million and the price to the public is at least $1.50 per share.

Preferred Stock Warrants

In September 2017, the Company exchanged 1,666,667 warrants for the purchase of Series B preferred stock at an exercise price of $0.45 per share into 1,666,667 warrants for the purchase of Series B-2 preferred stock at an exercise price of $0.45 per share. The exchange of Series B to Series B-2 warrants was accounted for as a modification with the newly issued warrants being remeasured and marked to market as the issuance date with a charge to change in fair value of the warrant liability in the accompanying consolidated statements of operations. In September, November and December 2017, in connection with the closing of the Series B-2 convertible preferred stock financings, the Company issued 3,398,045 warrants for the purchase of Series B-2 convertible preferred stock at an exercise price of $0.45 per share. As of December 31, 2018, no shares have been issued pursuant to the warrants. The warrants expire on various dates in September, November and December 2022. If the warrants have not been exercised prior to their expiration date, they will be deemed to automatically convert by "cashless" conversion. In the event that the Company is acquired, the warrants will be exercisable or deemed automatically converted, which shall be determined based upon whether the Company's successor assumes the obligations of the warrants.

Common Stock and Unvested Share Liability

The Company has issued restricted common stock subject to vesting and repurchase by the Company. For employee awards, the issuance date fair value is recognized over the requisite service period of the award (usually the vesting period) on a straight-line basis. For nonemployee awards, the Company uses the fair value method and periodically revalues such awards over the vesting term. In addition, the Company has outstanding unvested shares related to the early exercise of stock options. The Company has the right, but not the obligation, to repurchase any unvested shares at the original purchase price upon any voluntary or involuntary termination. The consideration received in exchange for unvested shares is recorded as an unvested share liability on the accompanying consolidated balance sheets and is reclassified into common stock and additional paid-in capital as the shares vest. For the years ended December 31, 2018 and 2017, stock-based compensation of $0.1 million and $0.2 million, respectively, was recognized in connection with the restricted common stock awards. At December 31, 2018 and 2017, the unvested share liability was $54,000 and $89,000, respectively.

Oncternal Therapeutics, Inc.
Notes to Consolidated Financial Statements—(Continued)

A summary of the Company's unvested shares is as follows:

	Number of Unvested Shares
Balance at December 31, 2016	5,725,199
Early exercised stock options	50,000
Issuance of unvested restricted stock	1,299,397
Repurchased shares	(1,133,462)
Vested shares	(2,916,748)
Balance at December 31, 2017	3,024,386
Issuance of unvested restricted stock	200,000
Vested shares	(1,866,910)
Balance at December 31, 2018	1,357,476

For the years ended December 31, 2018 and 2017, the Company paid $0 and $16,000, respectively, to repurchase unvested shares.

Equity Incentive Plan

In July 2015, the Company adopted its 2015 Equity Incentive Plan (the "2015 Plan"), which provides for the issuance of incentive stock options, non-statutory stock options, restricted stock awards, restricted stock unit awards and other stock awards to its employees, members of its board of directors and consultants. No awards shall be granted under the 2015 Plan after July 2025. In general, the options issued under the 2015 Plan expire ten years from the date of grant and vest over a four-year period. Certain grants vest based on the achievement of development or regulatory milestones. The 2015 Plan allows for early exercise of all stock option grants if authorized by the board of directors at the time of grant. The Company has the option to repurchase any unvested shares at the original purchase price upon any voluntary or involuntary termination. The Company had 8,600,000 shares of common stock authorized for issuance under the 2015 Plan as of December 31, 2018, of which 1,090,081 remained available for future issuance.

A summary of the Company's stock option activity is as follows:

	Number of Outstanding Options	Weighted-Average Exercise Price	Weighted-Average Remaining Contractual Term (in years)	Aggregate Intrinsic Value (in thousands)
Balance at December 31, 2017	2,068,251	$ 0.05	7.9	$ —
Granted	4,825,000	$ 0.06		
Exercised	(25,000)	$ 0.05		
Balance at December 31, 2018	6,868,251	$ 0.06	9.0	$ 20
Vested and expected to vest December 31, 2018	6,868,251	$ 0.06	9.0	$ 20
Exercisable at December 31, 2018	2,655,751	$ 0.05	7.6	$ 20

Oncternal Therapeutics, Inc.
Notes to Consolidated Financial Statements—(Continued)

The aggregate intrinsic value of stock options exercised during the years ended December 31, 2018 and 2017 was not material. The intrinsic value is calculated as the difference between the fair value of the Company's common stock at the time of the option exercise and the exercise price of that stock option.

Stock-Based Compensation Expense

The weighted-average assumptions used in the Black-Scholes option pricing model to determine the fair value of employee stock option grants were as follows:

	Years Ended December 31,	
	2018	2017
Risk-free interest rate	2.88%	1.96%
Expected volatility	64.7%	69.0%
Expected term (in years)	6.1	6.1
Expected dividend yield	0.0%	0.0%

Expected volatility. Since the Company is not a public company and does not have a trading history for its common stock, the expected volatility assumption is based on volatilities of a peer group of similar companies whose share prices are publicly available. The peer group was developed based on companies in the life sciences industry. The Company will continue to apply this process until a sufficient amount of historical information regarding the volatility of its own stock price becomes available.

Expected term. The expected term represents the period of time that options are expected to be outstanding. Because the Company does not have historical exercise behavior, it determines the expected life assumption using the simplified method, for employees, which is an average of the contractual term of the option and its vesting period. The expected term for nonemployee options is generally the remaining contractual term.

Risk-free interest rate. The risk-free interest rate is based on the implied yield on the U.S. Treasury securities with a maturity date similar to the expected term of the associated stock option award.

Expected dividend yield. The Company bases the expected dividend yield assumption on the fact that it has never paid cash dividends and has no present intention to pay cash dividends and, therefore, used an expected dividend yield of zero.

Stock-based compensation expense recognized for all equity awards has been reported in the statements of operations as follows:

	Years Ended December 31,	
	2018	2017
	(in thousands)	
Research and development	$ 141	$ 72
General and administrative	39	116
	$ 180	$ 188

The weighted-average grant date fair value per share of employee option grants for the years ended December 31, 2018 and 2017 was $0.04 and $0.03, respectively. As of December 31, 2018, total unrecognized employee stock-based compensation expense was $191,000, which is expected to be recognized over a remaining weighted-average period of approximately 2.7 years.

Common Stock Reserved for Future Issuance

Common stock reserved for future issuance is as follows:

	December 31, 2018
Conversion of convertible preferred stock	111,034,576
Preferred stock warrants	5,064,712
Common stock options issued and outstanding	6,868,251
Common stock available for issuance under the 2015 Plan	1,090,081
	124,057,620

6. Income Taxes

A reconciliation of the Company's effective tax rate to the federal statutory rate is as follows:

	Years Ended December 31,	
	2018	2017
	(in thousands)	
Tax computed at federal statutory rate	$ (1,379)	$ (3,548)
State taxes, net	(500)	(605)
Permanent differences	(147)	118
Research and development credits	(468)	(186)
Tax Cuts and Jobs Act	—	2,789
Other	51	50
Valuation allowance	2,443	1,382
	$ —	$ —

Significant components of the Company's net deferred tax assets are as follows:

	December 31,	
	2018	2017
	(in thousands)	
Deferred tax assets:		
Net operating loss carryforwards	$ 8,321	$ 6,312
Research and development credit carryforwards	1,231	771
Accrued expenses	24	25
Other, net	288	314
Total deferred tax assets	9,864	7,422
Valuation allowance	(9,864)	(7,422)
Net deferred taxes	$ —	$ —

Based upon the Company's history of operating losses, the Company is unable to conclude that it is more likely than not that the benefit of its deferred tax assets will be realized. Accordingly, the Company has provided a full valuation allowance for its deferred tax assets as of December 31, 2018 and 2017.

At December 31, 2018, the Company had federal and state net operating loss carryforwards of approximately $29.7 million. Of the federal net operating losses, $7.0 million do not expire, and the remaining

federal and state net operating loss carryforwards will begin expiring in 2033, unless previously utilized. At December 31, 2018, the Company had federal and state research and development credit carryforwards of approximately $0.9 million and $0.5 million, respectively. The federal research and development credit carryforwards will begin expiring in 2034, unless previously utilized. The state research and development credits do not expire.

Pursuant to Internal Revenue Code Sections 382 and 383, annual use of the Company's net operating loss and research and development tax credit carryforwards may be limited in the event a cumulative change in ownership of more than 50% occurs within a three-year period. The Company has not completed a Section 382 study to assess whether an ownership change has occurred or whether there have been multiple ownership changes since the Company's formation due to the complexity and cost associated with such a study and the fact that there may be additional such ownership changes in the future. If eliminated, the related asset would be removed from the deferred tax asset schedule with a corresponding reduction in the valuation allowance. Due to the existence of the valuation allowance, limitations created by future ownership changes, if any, will not impact the Company's effective tax rate.

The Tax Act was enacted on December 22, 2017. The Tax Act reduced the U.S. federal corporate tax rate from a maximum of 35% to a flat 21%. The reduction in rate resulted in a remeasurement of the Company's deferred tax assets at December 31, 2017 based on the rates at which they were expected to reverse in the future, resulting in a reduction in the deferred tax asset balance of $2.8 million, which was offset by a reduction in the valuation allowance by a corresponding amount.

The Company recognizes a tax benefit from an uncertain tax position when it is more likely than not that the position will be sustained upon examination, including resolutions of any related appeals or litigation processes, based on the technical merits. Income tax positions must meet a more likely than not recognition at the effective date to be recognized. At December 31, 2018 and 2017, there were no unrecognized tax benefits recorded in the consolidated financial statements. The Company does not expect any material changes to unrecognized tax benefits within the next twelve months.

The Company is subject to taxation in the United States federal and state jurisdictions. The Company's federal income tax and state income tax returns since inception in 2013 through 2018 are subject to examination by federal and state tax authorities due to the carryforward of unutilized net operating losses and research and development credits. The Company is not currently under examination by any tax authority.

The Company's policy is to recognize interest and penalties related to income tax matters in income tax expense. The Company has not recognized interest or penalties in its consolidated statements of operations since inception.

7. Subsequent Events

Merger Agreement

On March 6, 2019, the Company entered into an Agreement and Plan of Merger (the "Merger Agreement") with GTx, Inc. ("GTx") and Grizzly Merger Sub, Inc., a wholly-owned subsidiary of GTx ("Merger Sub"). Upon the terms and subject to the satisfaction of the conditions described in the Merger Agreement, including approval of the transaction by the Company's stockholders and GTx's stockholders, Merger Sub will be merged with and into the Company, with the Company surviving the Merger as a wholly-owned subsidiary of GTx.

Under the exchange ratio formula in the Merger Agreement, the former Company stockholders immediately before the Merger are expected to own approximately 75% of the outstanding capital stock of GTx, and the

Oncternal Therapeutics, Inc.
Notes to Consolidated Financial Statements—(Continued)

stockholders of GTx immediately before the Merger are expected to own approximately 25% of the outstanding capital stock of GTx, subject to certain assumptions. The exchange ratio formula excludes the Company's outstanding stock options and warrants and GTx's outstanding stock options and warrants.

Annex A

AGREEMENT AND PLAN OF MERGER AND REORGANIZATION

among:

GTx, Inc.
a Delaware corporation;

GRIZZLY MERGER SUB, INC.,
a Delaware corporation; and

ONCTERNAL THERAPEUTICS, INC.,
a Delaware corporation

Dated as of March 6, 2019

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AGREEMENT AND PLAN OF MERGER AND REORGANIZATION

THIS AGREEMENT AND PLAN OF MERGER AND REORGANIZATION (this "***Agreement***") is made and entered into as of March 6, 2019, by and among **GTx, Inc**., a Delaware corporation ("***Parent***") **Grizzly Merger Sub, Inc.**, a Delaware corporation and wholly owned subsidiary of Parent ("***Merger Sub***"), and Oncternal Therapeutics, Inc., a Delaware corporation (the "***Company***"). Certain capitalized terms used in this Agreement are defined in **Exhibit A**.

RECITALS

A. Parent and the Company intend to effect a merger of Merger Sub with and into the Company (the "***Merger***") in accordance with this Agreement and the DGCL. Upon consummation of the Merger, Merger Sub will cease to exist and the Company will become a wholly owned subsidiary of Parent.

B. The Parties intend that the Merger qualify as a "reorganization" within the meaning of Section 368(a) of the Code, and by executing this Agreement, the Parties intend to adopt a plan of reorganization within the meaning of Treasury Regulations Sections 1.368-2(g) and 1.368-3.

C. The Parent Board has (i) determined that the Contemplated Transactions are fair to, advisable and in the best interests of Parent and its stockholders, (ii) approved and declared advisable this Agreement and the Contemplated Transactions, including the issuance of shares of Parent Common Stock to the stockholders of the Company pursuant to the terms of this Agreement and (iii) determined to recommend, upon the terms and subject to the conditions set forth in this Agreement, that the stockholders of Parent vote to approve the Parent Stockholder Matters.

D. The Merger Sub Board has (i) determined that the Contemplated Transactions are fair to, advisable, and in the best interests of Merger Sub and its sole stockholder, (ii) approved and declared advisable this Agreement and the Contemplated Transactions and (iii) determined to recommend, upon the terms and subject to the conditions set forth in this Agreement, that the stockholder of Merger Sub votes to adopt this Agreement and thereby approve the Contemplated Transactions.

E. The Company Board has (i) determined that the Contemplated Transactions are fair to, advisable and in the best interests of the Company and its stockholders, (ii) approved and declared advisable this Agreement and the Contemplated Transactions and (iii) determined to recommend, upon the terms and subject to the conditions set forth in this Agreement, that the stockholders of the Company vote to approve the Company Stockholder Matters.

F. Concurrently with the execution and delivery of this Agreement and as a condition and inducement to Parent's willingness to enter into this Agreement, the officers, directors and stockholders of the Company listed on Section A of the Company Disclosure Schedule (solely in their capacity as stockholders of the Company) are executing (a) support agreements in favor of Parent in substantially the form attached hereto as **Exhibit B-1** (the "***Company Stockholder Support Agreement***"), pursuant to which such Persons (the "***Company Signatories***") have, subject to the terms and conditions set forth therein, agreed to vote all of their shares of Company Capital Stock in favor of the Company Stockholder Matters and against any proposals that compete with the Contemplated Transactions, and (b) lock-up agreements in substantially the form attached hereto as **Exhibit D** executed by the Company Signatories (each, a "***Company Lock-Up Agreement***").

G. Concurrently with the execution and delivery of this Agreement and as a condition and inducement to the Company's willingness to enter into this Agreement, the officers and directors of Parent listed on Section A of the Parent Disclosure Schedule (solely in their capacity as stockholders of Parent) are executing (a) support agreements in favor of the Company in substantially the form attached hereto as **Exhibit B-2** (the "***Parent***

Stockholder Support Agreement"), pursuant to which such Persons (the "***Parent Signatories***") have, subject to the terms and conditions set forth therein, agreed to vote all of their shares of Parent Common Stock in favor of the Parent Stockholder Matters and against any proposals that compete with the Contemplated Transactions and (b) lock-up agreements in substantially the form attached hereto as **Exhibit D** executed by the Parent Signatories (each, a "***Parent Lock-Up Agreement***").

H. It is expected that promptly after the Registration Statement is declared effective under the Securities Act (but in no event later than 10 Business Days following the effectiveness of the Registration Statement), the Company shall deliver the Company Stockholder Written Consent evidencing the Required Company Stockholder Vote.

AGREEMENT

The Parties, intending to be legally bound, agree as follows:

Section 1. DESCRIPTION OF TRANSACTION

1.1 **The Merger**. Upon the terms and subject to the conditions set forth in this Agreement, at the Effective Time, Merger Sub shall be merged with and into the Company, and the separate existence of Merger Sub shall cease. The Company will continue as the surviving corporation in the Merger (the "***Surviving Corporation***").

1.2 **Effects of the Merger**. The Merger shall have the effects set forth in this Agreement, the Certificate of Merger and in the applicable provisions of the DGCL. As a result of the Merger, the Company will become a wholly owned subsidiary of Parent.

1.3 **Closing; Effective Time**. Unless this Agreement is earlier terminated pursuant to the provisions of Section 9.1, and subject to the satisfaction or waiver of the conditions set forth in Sections 6, 7 and 8, the consummation of the Merger (the "***Closing***") shall take place remotely as promptly as practicable (but in no event later than the second Business Day following the satisfaction or waiver of the last to be satisfied or waived of the conditions set forth in Sections 6, 7 and 8, other than those conditions that by their nature are to be satisfied at the Closing, but subject to the satisfaction or waiver of each of such conditions), or at such other time, date and place as Parent and the Company may mutually agree in writing. The date on which the Closing actually takes place is referred to as the "***Closing Date***." At the Closing, the Parties shall cause the Merger to be consummated by executing and filing with the Secretary of State of the State of Delaware a certificate of merger with respect to the Merger, satisfying the applicable requirements of the DGCL and in a form reasonably acceptable to Parent and the Company (the "***Certificate of Merger***"). The Merger shall become effective at the time of the filing of such Certificate of Merger with the Secretary of State of the State of Delaware or at such later time as may be specified in such Certificate of Merger with the consent of Parent and the Company (the time as of which the Merger becomes effective being referred to as the "***Effective Time***").

1.4 **Certificate of Incorporation and Bylaws; Directors and Officers**. At the Effective Time:

(a) the certificate of incorporation of the Surviving Corporation shall be amended and restated in its entirety to read identically to the certificate of incorporation of Merger Sub as in effect immediately prior to the Effective Time, until thereafter amended as provided by the DGCL and such certificate of incorporation; *provided*, *however*, that at the Effective Time, Parent shall file an amendment to the Surviving Company's certificate of incorporation to (i) change the name of the Surviving Corporation to Oncternal Oncology, Inc. and (ii) make such other changes as are mutually agreed to by Parent and the Company.

(b) the certificate of incorporation of Parent shall be identical to the certificate of incorporation of Parent immediately prior to the Effective Time, until thereafter amended as provided by the DGCL and such

certificate of incorporation, *provided, however*, that at the Effective Time, Parent shall file an amendment to its certificate of incorporation to (i) change the name of Parent to Oncternal Therapeutics, Inc., (ii) as contemplated by Section 5.3(a)(i), effect the Nasdaq Reverse Split and (iii) make such other changes as are mutually agreeable to Parent and the Company;

(c) the bylaws of the Surviving Corporation shall be amended and restated in their entirety to read identically to the bylaws of Merger Sub as in effect immediately prior to the Effective Time (except that the name of the Surviving Corporation in such bylaws shall reflect the name identified in Section 1.4(a)), until thereafter amended as provided by the DGCL and such bylaws;

(d) the directors and officers of Parent, each to hold office in accordance with the certificate of incorporation and bylaws of Parent, shall be as set forth in Section 5.12; and

(e) the directors and officers of the Surviving Corporation, each to hold office in accordance with the certificate of incorporation and bylaws of the Surviving Corporation, shall be the directors and officers of Parent as set forth in Section 5.12, after giving effect to the provisions of Section 5.12, or such other persons as shall be mutually agreed upon by Parent and the Company.

1.5 **Conversion of Shares**.

(a) At the Effective Time, by virtue of the Merger and without any further action on the part of Parent, Merger Sub, the Company or any stockholder of the Company or Parent:

(i) any shares of Company Common Stock held as treasury stock or held or owned by the Company, Merger Sub or any Subsidiary of the Company immediately prior to the Effective Time shall be canceled and retired and shall cease to exist, and no consideration shall be delivered in exchange therefor; and

(ii) subject to Section 1.5(c), each share of Company Common Stock outstanding immediately prior to the Effective Time (excluding shares to be canceled pursuant to Section 1.5(a)(i) and excluding Dissenting Shares) shall be automatically converted solely into the right to receive a number of shares of Parent Common Stock equal to the Exchange Ratio (the "***Merger Consideration***").

(b) If any shares of Company Common Stock outstanding immediately prior to the Effective Time are unvested or are subject to a repurchase option or a risk of forfeiture under any applicable restricted stock purchase agreement or other similar agreement with the Company, then the shares of Parent Common Stock issued in exchange for such shares of Company Common Stock will to the same extent be unvested and subject to the same repurchase option or risk of forfeiture, and such shares of Parent Common Stock shall accordingly be marked with appropriate legends. The Company shall take all actions that may be reasonably necessary to ensure that, from and after the Effective Time, Parent is entitled to exercise any such repurchase option or other right set forth in any such restricted stock purchase agreement or other agreement in accordance with its terms.

(c) No fractional shares of Parent Common Stock shall be issued in connection with the Merger, and no certificates or scrip for any such fractional shares shall be issued. Any holder of Company Common Stock who would otherwise be entitled to receive a fraction of a share of Parent Common Stock (after aggregating all fractional shares of Parent Common Stock issuable to such holder) shall, in lieu of such fraction of a share and upon surrender by such holder of a letter of transmittal in accordance with Section 1.8 and any accompanying documents as required therein, be paid in cash the dollar amount (rounded to the nearest whole cent), without interest, determined by multiplying such fraction by the Parent Closing Price.

(d) All Company Options outstanding immediately prior to the Effective Time under the Company Plans shall be treated in accordance with Section 5.5(a).

(e) All Company Warrants outstanding immediately prior to the Effective Time shall be treated in accordance with Section 5.5(c).

(f) Each share of common stock, $0.001 par value per share, of Merger Sub issued and outstanding immediately prior to the Effective Time shall be converted into and exchanged for one validly issued, fully paid and nonassessable share of common stock, $0.001 par value per share, of the Surviving Corporation. Each stock certificate of Merger Sub evidencing ownership of any such shares shall, as of the Effective Time, evidence ownership of such shares of common stock of the Surviving Corporation.

(g) If, between the time of calculating the Exchange Ratio and the Effective Time, any outstanding shares of Company Capital Stock or Parent Common Stock shall have been changed into, or exchanged for, a different number of shares or a different class, by reason of any stock dividend, subdivision, reclassification, recapitalization, split (including the Nasdaq Reverse Split to the extent such split has not been previously taken into account in calculating the Exchange Ratio), combination or exchange of shares or other like change, the Exchange Ratio shall, to the extent necessary, be equitably adjusted to reflect such change to the extent necessary to provide the holders of Company Capital Stock, Parent Common Stock, Company Options and Company Warrants with the same economic effect as contemplated by this Agreement prior to such stock dividend, subdivision, reclassification, recapitalization, split (including the Nasdaq Reverse Split), combination or exchange of shares or other like change; *provided, however*, that nothing herein will be construed to permit the Company or Parent to take any action with respect to Company Capital Stock or Parent Common Stock, respectively, that is prohibited or not expressly permitted by the terms of this Agreement.

1.6 **Contingent Value Right**.

(a) Holders of Parent Common Stock of record as of immediately prior to the Effective Time shall be entitled to one contractual contingent value right (a "***CVR***") issued by Parent subject to and in accordance with the terms and conditions of the CVR Agreement, attached hereto as **Exhibit E** (the "***CVR Agreement***"), for each share of Parent Common Stock held by such holders, including Parent Common Stock subject to any Parent Deferred Stock Right.

(b) At or prior to the Effective Time, Parent shall authorize and duly adopt, execute and deliver, and will ensure that Exchange Agent and CVR Representative execute and deliver, the CVR Agreement, subject to any reasonable revisions to the CVR Agreement that are requested by such Exchange Agent (provided that such revisions are not, individually or in the aggregate, detrimental or adverse, taken as a whole, to any holder of CVR). Parent and the Company shall cooperate, including by making changes to the form of CVR Agreement, as necessary to ensure that the CVRs are not subject to registration under the Securities Act, the Exchange Act or any applicable state securities or "blue sky" laws.

(c) Parent, the Exchange Agent and (if necessary) CVR Representative shall, at or prior to the Effective Time, duly authorize, execute and deliver the CVR Agreement.

1.7 **Closing of the Company's Transfer Books**. At the Effective Time: (a) all shares of Company Common Stock outstanding immediately prior to the Effective Time shall be treated in accordance with Section 1.5(a), and all holders of certificates representing shares of Company Capital Stock that were outstanding immediately prior to the Effective Time shall cease to have any rights as stockholders of the Company; and (b) the stock transfer books of the Company shall be closed with respect to all shares of Company Capital Stock outstanding immediately prior to the Effective Time. No further transfer of any such shares of Company Capital Stock shall be made on such stock transfer books after the Effective Time. If, after the Effective Time, a valid certificate previously representing any shares of Company Capital Stock, including any valid certificate representing any shares of Company Preferred Stock previously converted into shares of Company Common Stock in connection with the Preferred Stock Conversion, outstanding immediately prior to the Effective Time (a "***Company Stock Certificate***") is presented to the Exchange Agent or to the Surviving Corporation, such Company Stock Certificate shall be canceled and shall be exchanged as provided in Sections 1.5 and 1.8.

1.8 **Surrender of Certificates**.

(a) No later than 10 Business Days after the date that the Registration Statement is declared effective, Parent and the Company shall agree upon and select a reputable bank, transfer agent or trust company to act as exchange agent in the Merger (the "***Exchange Agent***"). At the Effective Time, Parent shall deposit with the Exchange Agent: (i) certificates or evidence of book-entry shares representing the Parent Common Stock issuable pursuant to Section 1.5(a) and (ii) cash sufficient to make payments in lieu of fractional shares in accordance with Section 1.5(c). The Parent Common Stock and cash amounts so deposited with the Exchange Agent, together with any dividends or distributions received by the Exchange Agent with respect to such shares, are referred to collectively as the "***Exchange Fund***."

(b) Promptly after the Effective Time, the Parties shall cause the Exchange Agent to mail to the Persons who were record holders of shares of Company Capital Stock that were converted into the right to receive the Merger Consideration: (i) a letter of transmittal in customary form and containing such provisions as Parent may reasonably specify (including a provision confirming that delivery of Company Stock Certificates shall be effected, and risk of loss and title to Company Stock Certificates shall pass, only upon proper delivery of such Company Stock Certificates to the Exchange Agent); and (ii) instructions for effecting the surrender of Company Stock Certificates in exchange for shares of Parent Common Stock. Upon surrender of a Company Stock Certificate to the Exchange Agent for exchange, together with a duly executed letter of transmittal and such other documents as may be reasonably required by the Exchange Agent or Parent: (A) the holder of such Company Stock Certificate shall be entitled to receive in exchange therefor a certificate or certificates or book-entry shares representing the Merger Consideration (in a number of whole shares of Parent Common Stock) that such holder has the right to receive pursuant to the provisions of Section 1.5(a) (and cash in lieu of any fractional share of Parent Common Stock pursuant to the provisions of Section 1.5(c)); and (B) the Company Stock Certificate so surrendered shall be canceled. Until surrendered as contemplated by this Section 1.8(b), each Company Stock Certificate shall be deemed, from and after the Effective Time, to represent only the right to receive a certificate or certificates or book-entry shares of Parent Common Stock representing the Merger Consideration (and cash in lieu of any fractional share of Parent Common Stock). If any Company Stock Certificate shall have been lost, stolen or destroyed, Parent may, in its discretion and as a condition precedent to the delivery of any shares of Parent Common Stock, require the owner of such lost, stolen or destroyed Company Stock Certificate to provide an applicable affidavit with respect to such Company Stock Certificate that includes an obligation of such owner to indemnify Parent against any claim suffered by Parent related to the lost, stolen or destroyed Company Stock Certificate as Parent may reasonably request. In the event of a transfer of ownership of a Company Stock Certificate that is not registered in the transfer records of the Company, payment of the Merger Consideration in respect of such Company Stock Certificate may be made to a Person other than the Person in whose name such Company Stock Certificate so surrendered is registered if such Company Stock Certificate shall be properly endorsed or otherwise be in proper form for transfer and the Person requesting such payment shall pay any transfer or other Taxes required by reason of the transfer or establish to the reasonable satisfaction of Parent that such Taxes have been paid or are not applicable. The Merger Consideration and any dividends or other distributions as are payable pursuant to Section 1.8(c) shall be deemed to have been in full satisfaction of any and all rights pertaining to Company Capital Stock formerly represented by such Company Stock Certificate.

(c) No dividends or other distributions declared or made with respect to Parent Common Stock with a record date on or after the Effective Time shall be paid to the holder of any unsurrendered Company Stock Certificate with respect to the shares of Parent Common Stock that such holder has the right to receive in the Merger until such holder surrenders such Company Stock Certificate or provides an affidavit of loss or destruction in lieu thereof in accordance with this Section 1.8 (at which time (or, if later, on the applicable payment date) such holder shall be entitled, subject to the effect of applicable abandoned property, escheat or similar Laws, to receive all such dividends and distributions, without interest).

(d) Any portion of the Exchange Fund that remains undistributed to holders of Company Stock Certificates as of the date that is one year after the Closing Date shall be delivered to Parent upon demand, and

any holders of Company Stock Certificates who have not theretofore surrendered their Company Stock Certificates in accordance with this Section 1.8 shall thereafter look only to Parent for satisfaction of their claims for Parent Common Stock, cash in lieu of fractional shares of Parent Common Stock and any dividends or distributions with respect to shares of Parent Common Stock.

(e) No party to this Agreement shall be liable to any holder of any Company Stock Certificate or to any other Person with respect to any shares of Parent Common Stock (or dividends or distributions with respect thereto) or for any cash amounts delivered to any public official pursuant to any applicable abandoned property Law, escheat Law or similar Law.

1.9 **Appraisal Rights**.

(a) Notwithstanding any provision of this Agreement to the contrary, shares of Company Capital Stock that are outstanding immediately prior to the Effective Time and which are held by stockholders who have exercised and perfected appraisal rights for such shares of Company Capital Stock in accordance with the DGCL or the CCC, as applicable (collectively, the "***Dissenting Shares***") shall not be converted into or represent the right to receive the Merger Consideration described in Section 1.5 attributable to such Dissenting Shares. Such stockholders shall be entitled to receive payment of the appraised value of such shares of Company Capital Stock held by them in accordance with the DGCL or the CCC, as applicable, unless and until such stockholders fail to perfect or effectively withdraw or otherwise lose their appraisal rights under the DGCL or the CCC, as applicable. All Dissenting Shares held by stockholders who shall have failed to perfect or shall have effectively withdrawn or lost their right to appraisal of such shares of Company Capital Stock under the DGCL or the CCC, as applicable (whether occurring before, at or after the Effective Time) shall thereupon be deemed to be converted into and to have become exchangeable for, as of the Effective Time, the right to receive the Merger Consideration, without interest, attributable to such Dissenting Shares upon their surrender in the manner provided in Sections 1.5 and 1.8.

(b) The Company shall give Parent prompt written notice of any demands by dissenting stockholders received by the Company, withdrawals of such demands and any other instruments served on the Company and any material correspondence received by the Company in connection with such demands, and the Company shall have the right to direct all negotiations and proceedings with respect to such demands; *provided* that Parent shall have the right to participate in such negotiations and proceedings. Neither the Parent nor the Company shall, except with the prior written consent of the other Party, voluntarily make any payment with respect to, or settle or offer to settle, any such demands, or approve any withdrawal of any such demands or agree to do any of the foregoing.

1.10 **Further Action**. If, at any time after the Effective Time, any further action is determined by the Surviving Corporation to be necessary or desirable to carry out the purposes of this Agreement or to vest the Surviving Corporation with full right, title and possession of and to all rights and property of the Company, then the officers and directors of the Surviving Corporation shall be fully authorized, and shall use their and its commercially reasonable efforts (in the name of the Company, in the name of Merger Sub, in the name of the Surviving Corporation and otherwise) to take such action.

1.11 **Withholding**. The Parties and the Exchange Agent shall be entitled to deduct and withhold from the consideration otherwise payable pursuant to this Agreement to any holder of Company Capital Stock or any other Person such amounts as such Party or the Exchange Agent is required to deduct and withhold under the Code or any other Law with respect to the making of such payment. The payor shall provide commercially reasonable notice to the payee upon becoming aware of any such withholding obligation, and the Parties shall cooperate with each other to the extent reasonable to obtain reduction of or relief from such withholding. To the extent that amounts are so deducted and withheld and paid to the appropriate Person, such deducted and withheld amounts shall be treated for all purposes of this Agreement as having been paid to the Person in respect of whom such deduction and withholding was made.

1.12 **Calculation of Parent Cash Amount**.

(a) For the purposes of this Agreement, the "***Determination Date***" shall be the date that is 10 Business Days prior to the anticipated date for Closing, as agreed upon by Parent and the Company at least five Business Days prior to the Parent Stockholders' Meeting (the "***Anticipated Closing Date***"). Within five Business Days following the Determination Date, Parent shall deliver to the Company a schedule (the "***Parent Cash Schedule***") setting forth, in reasonable detail, Parent's good faith, estimated calculation of the Parent Cash Amount (using an estimate of the Parent Transaction Expenses, Parent's accrued investment interest receivable, prepaid refundable deposits, accounts payable and accrued expenses, in each case as of the Anticipated Closing Date and determined in a manner substantially consistent with the manner in which such items were determined for Parent's most recent SEC filings) (the "***Parent Cash Calculation***") as of the Anticipated Closing Date prepared and certified by Parent's principal accounting officer). Parent shall make the work papers and back-up materials used or useful in preparing the Parent Cash Schedule, as reasonably requested by the Company, available to the Company and, if requested by the Company, its accountants and counsel at reasonable times and upon reasonable notice. The Company shall deliver invoices evidencing the Combined Transaction Expenses to Parent no later than seven Business Days prior to Closing.

(b) Within three calendar days following delivery (the "***Response Date***") of the Parent Cash Schedule to the Company, the Company will have the right to dispute any part of such Parent Cash Schedule by delivering a written notice to that effect (a "***Dispute Notice***") to Parent. Any Dispute Notice shall identify in reasonable detail the nature of any proposed revisions to the Parent Cash Calculation.

(c) If on or prior to the Response Date, (i) the Company notifies Parent in writing that it has no objections to the Parent Cash Calculation or (ii) the Company fails to deliver a Dispute Notice as provided in Section 1.12(b), then the Parent Cash Calculation as set forth in the Parent Cash Schedule shall be deemed to have been finally determined for purposes of this Agreement and to represent the Parent Cash Amount at the Anticipated Closing Date for purposes of this Agreement.

(d) If the Company delivers a Dispute Notice on or prior to the Response Date, then Representatives of Parent and the Company shall promptly meet and attempt in good faith to resolve the disputed item(s) and negotiate an agreed-upon determination of the Parent Cash Amount, which agreed upon the Parent Cash Amount shall be deemed to have been finally determined for purposes of this Agreement and to represent the Parent Cash Amount at the Anticipated Closing Date for purposes of this Agreement.

(e) If Representatives of Parent and the Company are unable to negotiate an agreed-upon determination of the Parent Cash Amount at the Anticipated Closing Date pursuant to Section 1.12(d) within three calendar days after delivery of the Dispute Notice (or such other period as Parent and the Company may mutually agree upon), then Parent and the Company shall jointly select an independent auditor of recognized national standing (the "***Accounting Firm***") to resolve any remaining disagreements as to the Parent Cash Calculation. Parent shall promptly deliver to the Accounting Firm the work papers and back-up materials used in preparing the Parent Cash Schedule, and Parent and the Company shall use commercially reasonable efforts to cause the Accounting Firm to make its determination within 10 calendar days of accepting its selection. The Company and Parent shall be afforded the opportunity to present to the Accounting Firm any material related to the unresolved disputes and to discuss the issues with the Accounting Firm; *provided, however*, that no such presentation or discussion shall occur without the presence of a Representative of each of the Company and Parent. The determination of the Accounting Firm shall be limited to the disagreements submitted to the Accounting Firm. The determination of the amount of the Parent Cash Amount made by the Accounting Firm shall be deemed to have been finally determined for purposes of this Agreement and to represent the Parent Cash Amount at the Anticipated Closing Date for purposes of this Agreement, and the Parties shall delay the Closing until the resolution of the matters described in this Section 1.12(e). The fees and expenses of the Accounting Firm shall be allocated between Parent and the Company in the same proportion that the disputed amount of the Parent Cash Amount that was unsuccessfully disputed by such Party (as finally determined by the Accounting

Firm) bears to the total disputed amount of the Parent Cash Amount (and for the avoidance of doubt the fees and expenses to be paid by Parent shall reduce the Parent Cash Amount). If this Section 1.12(e) applies as to the determination of the Parent Cash Amount at the Anticipated Closing Date described in Section 1.12(a), upon resolution of the matter in accordance with this Section 1.12(e), the Parties shall not be required to determine the Parent Cash Amount again even though the Closing Date may occur later than the Anticipated Closing Date, except that either Party may request a redetermination of the Parent Cash Amount if the Closing Date is more than five Business Days after the Anticipated Closing Date.

1.13 **Calculation of Company Cash Amount.**

(a) Within five Business Days following the Determination Date, the Company shall deliver to Parent a schedule (the "***Company Cash Schedule***") setting forth, in reasonable detail, the Company's good faith, estimated calculation of the Company Cash Amount in accordance with GAAP (the "***Company Cash Calculation***") as of the Anticipated Closing Date prepared and certified by the Company's Chief Financial Officer. The Company shall make the work papers and back-up materials used or useful in preparing the Company Cash Schedule, as reasonably requested by Parent, available to Parent and, if requested by Parent, its accountants and counsel at reasonable times and upon reasonable notice.

(b) By the Response Date, Parent will have the right to dispute any part of such Company Cash Schedule by delivering a Dispute Notice. Any Dispute Notice shall identify in reasonable detail the nature of any proposed revisions to the Company Cash Calculation.

(c) If on or prior to the Response Date, (i) Parent notifies the Company in writing that it has no objections to the Company Cash Calculation or (ii) Parent fails to deliver a Dispute Notice as provided in Section 1.13(b), then the Parent Cash Calculation as set forth in the Company Cash Schedule shall be deemed to have been finally determined for purposes of this Agreement and to represent the Company Cash Amount at the Anticipated Closing Date for purposes of this Agreement.

(d) If Parent delivers a Dispute Notice on or prior to the Response Date, then Representatives of the Company and Parent shall promptly meet and attempt in good faith to resolve the disputed item(s) and negotiate an agreed-upon determination of the Company Cash Amount, which agreed upon the Company Cash Amount shall be deemed to have been finally determined for purposes of this Agreement and to represent the Company Cash Amount at the Anticipated Closing Date for purposes of this Agreement.

(e) If Representatives of the Company and Parent are unable to negotiate an agreed-upon determination of Company Cash Amount at the Anticipated Closing Date pursuant to Section 1.13(d) within three calendar days after delivery of the Dispute Notice (or such other period as the Company and Parent may mutually agree upon), then the Company and Parent shall jointly select the Accounting Firm to resolve any remaining disagreements as to the Company Cash Calculation. The Company shall promptly deliver to the Accounting Firm the work papers and back-up materials used in preparing the Company Cash Schedule, and the Company and Parent shall use commercially reasonable efforts to cause the Accounting Firm to make its determination within 10 calendar days of accepting its selection. Parent and the Company shall be afforded the opportunity to present to the Accounting Firm any material related to the unresolved disputes and to discuss the issues with the Accounting Firm; *provided*, *however*, that no such presentation or discussion shall occur without the presence of a Representative of each of Parent and the Company. The determination of the Accounting Firm shall be limited to the disagreements submitted to the Accounting Firm. The determination of the amount of the Company Cash Amount made by the Accounting Firm shall be deemed to have been finally determined for purposes of this Agreement and to represent the Company Cash Amount at the Anticipated Closing Date for purposes of this Agreement, and the Parties shall delay the Closing until the resolution of the matters described in this Section 1.13(e). The fees and expenses of the Accounting Firm shall be allocated between the Company and Parent in the same proportion that the disputed amount of the Company Cash Amount that was unsuccessfully disputed by such Party (as finally determined by the Accounting Firm) bears to the total disputed amount of the

Company Cash Amount (and for the avoidance of doubt the fees and expenses to be paid by the Company shall reduce the Company Cash Amount). If this Section 1.13(e) applies as to the determination of the Company Cash Amount at the Anticipated Closing Date described in Section 1.13(a), upon resolution of the matter in accordance with this Section 1.12(e), the Parties shall not be required to determine the Company Cash Amount again even though the Closing Date may occur later than the Anticipated Closing Date, except that either Party may request a redetermination of the Company Cash Amount if the Closing Date is more than five Business Days after the Anticipated Closing Date.

Section 2. REPRESENTATIONS AND WARRANTIES OF THE COMPANY

Subject to Section 10.13(h), except as set forth in the disclosure schedule delivered by the Company to Parent (the "***Company Disclosure Schedule***"), the Company represents and warrants to Parent and Merger Sub as follows:

2.1 **Due Organization; Subsidiaries**.

(a) The Company is a corporation or other legal entity duly incorporated, validly existing and in good standing under the Laws of Delaware and has all necessary corporate power and authority: (i) to conduct its business in the manner in which its business is currently being conducted; (ii) to own or lease and use its property and assets in the manner in which its property and assets are currently owned or leased and used; and (iii) to perform its obligations under all Contracts by which it is bound.

(b) The Company is duly licensed and qualified to do business, and is in good standing (to the extent applicable in such jurisdiction), under the Laws of all jurisdictions where the nature of its business requires such licensing or qualification other than in jurisdictions where the failure to be so qualified individually or in the aggregate would not be reasonably expected to have a Company Material Adverse Effect.

(c) The Company has no Subsidiaries, except for the Entities identified in Section 2.1(c) of the Company Disclosure Schedule; and neither the Company nor any of the Entities identified in Section 2.1(c) of the Company Disclosure Schedule owns any capital stock of, or any equity, ownership or profit sharing interest of any nature in, or controls directly or indirectly, any other Entity other than the Entities identified in Section 2.1(c) of the Company Disclosure Schedule. Each of the Company's Subsidiaries is a corporation or other legal entity duly organized, validly existing and, if applicable, in good standing under the Laws of the jurisdiction of its organization and has all necessary corporate or other power and authority to conduct its business in the manner in which its business is currently being conducted and to own or lease and use its property and assets in the manner in which its property and assets are currently owned or leased and used, except where the failure to have such power or authority would not be reasonably expected to have a Company Material Adverse Effect.

(d) Neither the Company nor any of its Subsidiaries is or has otherwise been, directly or indirectly, a party to, member of or participant in any partnership, joint venture or similar business entity. Neither the Company nor any of its Subsidiaries has agreed or is obligated to make, or is bound by any Contract under which it may become obligated to make, any future investment in or capital contribution to any other Entity. Neither the Company nor any of its Subsidiaries has, at any time, been a general partner of, or has otherwise been liable for any of the debts or other obligations of, any general partnership, limited partnership or other Entity.

2.2 **Organizational Documents**. The Company has made available to Parent accurate and complete copies of the Organizational Documents of the Company and each of its Subsidiaries in effect as of the date of this Agreement. Neither the Company nor any of its Subsidiaries is in material breach or violation of its respective Organizational Documents.

2.3 **Authority; Binding Nature of Agreement.**

(a) The Company has all necessary corporate power and authority to enter into and to perform its obligations under this Agreement and, subject to receipt of the Required Company Stockholder Vote, to

perform its obligations hereunder and to consummate the Contemplated Transactions. The Company Board (at meetings duly called and held) has (i) determined that the Contemplated Transactions are fair to, advisable and in the best interests of the Company and its stockholders, (ii) approved and declared advisable this Agreement and the Contemplated Transactions and (iii) determined to recommend, upon the terms and subject to the conditions set forth in this Agreement, that the stockholders of the Company vote in favor of the Company Stockholder Matters.

(b) This Agreement has been duly executed and delivered by the Company and assuming the due authorization, execution and delivery by Parent and Merger Sub, constitutes the legal, valid and binding obligation of the Company, enforceable against the Company in accordance with its terms, subject to the Enforceability Exceptions. Prior to the execution of the Company Stockholder Support Agreements, the Company Board approved the Company Stockholder Support Agreements and the transactions contemplated thereby.

2.4 **Vote Required.** The affirmative vote (or written consent) of (a) the holders of a majority of the shares of Company Common Stock and Company Preferred Stock, voting as a single class, (b) the holders of at least 60% of the shares of Company Preferred Stock, voting together as a single class, (c) the holders of at least a majority of the outstanding shares of Series A Preferred Stock, voting as a single class, (d) the holders of at least a majority of the outstanding shares of Series B Preferred Stock and Series B-2 Preferred Stock, voting together as a single class, and (e) the holders of at least 70% of the shares of Series C Preferred Stock, voting as a single class, in each case, outstanding on the record date for the written consent in lieu of a meeting pursuant to Section 228 of the DGCL approving the Company Stockholder Matters, in a form reasonably acceptable to Parent (collectively, the ***Company Stockholder Written Consent***") and entitled to vote thereon (collectively, the "***Required Company Stockholder Vote***"), is the only vote (or written consent) of the holders of any class or series of Company Capital Stock necessary to adopt and approve the Company Stockholder Matters.

2.5 **Non-Contravention; Consents.** Subject to obtaining the Required Company Stockholder Vote, the filing of the Certificate of Merger required by the DGCL, and the expiration or termination of any waiting period under the HSR Act, and any applicable foreign competition Laws, neither (x) the execution, delivery or performance of this Agreement by the Company, nor (y) the consummation of the Contemplated Transactions, will directly or indirectly (with or without notice or lapse of time):

(a) contravene, conflict with or result in a violation of any of the provisions of the Company's Organizational Documents;

(b) contravene, conflict with or result in a material violation of, or to the Knowledge of the Company give any Governmental Body or other Person the right to challenge the Contemplated Transactions or to exercise any material remedy or obtain any material relief under, any Law or any order, writ, injunction, judgment or decree to which the Company or its Subsidiaries, or any of the assets owned or used by the Company or its Subsidiaries, is subject, except as would not reasonably be expected to be material to the Company or its business;

(c) contravene, conflict with or result in a violation of any of the terms or requirements of, or give any Governmental Body the right to revoke, withdraw, suspend, cancel, terminate or modify, any Governmental Authorization that is held by the Company or its Subsidiaries, except as would not reasonably be expected to be material to the Company or its business;

(d) contravene, conflict with or result in a violation or breach of, or result in a default under, any provision of any Company Material Contract, or give any Person the right to: (i) declare a default or exercise any remedy under any Company Material Contract; (ii) any material payment, rebate, chargeback, penalty or change in delivery schedule under any Company Material Contract; (iii) accelerate the maturity or performance of any Company Material Contract; or (iv) cancel, terminate or modify any term of any Company Material Contract, except in the case of any non-material breach, default, penalty or modification; or

(e) result in the imposition or creation of any Encumbrance upon or with respect to any material asset owned or used by the Company or its Subsidiaries (except for Permitted Encumbrances).

Except for (i) any Consent set forth on Section 2.5 of the Company Disclosure Schedule under any Company Contract, (ii) the Required Company Stockholder Vote, (iii) the filing of the Certificate of Merger with the Secretary of State of the State of Delaware pursuant to the DGCL, and (iv) such consents, waivers, approvals, orders, authorizations, registrations, declarations and filings as may be required under applicable federal and state securities Laws, neither the Company nor any of its Subsidiaries is or will be required to make any filing with or give any notice to, or to obtain any Consent from, any Person in connection with (A) the execution, delivery or performance of this Agreement, the Company Stockholder Support Agreements, and the Company Lock-up Agreements or (B) the consummation of the Contemplated Transactions, which if individually or in the aggregate were not given or obtained, would reasonably be expected to prevent or materially delay the ability of Parent and Merger Sub to consummate the Contemplated Transactions. The Company Board has taken and will take all actions necessary to ensure that the restrictions applicable to business combinations contained in Section 203 of the DGCL are, and will be, inapplicable to the execution, delivery and performance of this Agreement, the Company Stockholder Support Agreements, the Company Lock-Up Agreements and to the consummation of the Contemplated Transactions. No other state takeover statute or similar Law applies or purports to apply to the Merger, this Agreement, the Company Stockholder Support Agreements, the Company Lock-Up Agreements or any of the Contemplated Transactions.

2.6 **Capitalization.**

(a) The authorized Company Capital Stock as of the date of this Agreement consists of (i) 200,000,000 shares of Company Common Stock, par value $0.0001 per share, of which 51,282,780 shares have been issued and are outstanding as of the date of this Agreement and 882,388 shares of are held by the Company as treasury shares as of the date of this Agreement, and (ii) 130,099,288 shares of preferred stock, par value $0.0001 per share (the "***Company Preferred Stock***"), of which 111,034,576 have been issued and are outstanding as of the date of this Agreement, consisting of 13,560,000 shares of Series A Preferred Stock, 6,750,721 shares of Series B Preferred Stock, 56,723,855 shares of Series B-2 Preferred Stock and 34,000,000 shares of Series C Preferred Stock. Company Warrants to purchase 5,064,712 shares of Series B-2 Preferred Stock are issued and outstanding as of the date of this Agreement. Section 2.6(a) of the Company Disclosure Schedule lists, as of the date of this Agreement (A) each record holder of issued and outstanding Company Capital Stock and the number and type of shares of Company Capital Stock held by such holder; and (B)(1) each holder of issued and outstanding Company Warrants, (2) the number and type of shares subject to each Company Warrant, (3) the exercise price of each Company Warrant and (4) the termination date of each Company Warrant.

(b) All of the outstanding shares of Company Common Stock and Company Preferred Stock have been duly authorized and validly issued, and are fully paid and nonassessable. Except as set forth in the Company Bylaws or Investor Agreements, none of the outstanding shares of Company Capital Stock is entitled or subject to any preemptive right, right of participation, right of maintenance or any similar right and none of the outstanding shares of Company Capital Stock is subject to any right of first refusal in favor of the Company. Except as contemplated herein and in the Company Bylaws and Investor Agreements, there is no Company Contract relating to the voting or registration of, or restricting any Person from purchasing, selling, pledging or otherwise disposing of (or granting any option or similar right with respect to), any shares of Company Capital Stock. The Company is not under any obligation, nor is it bound by any Contract pursuant to which it may become obligated, to repurchase, redeem or otherwise acquire any outstanding shares of Company Capital Stock or other securities. Section 2.6(b) of the Company Disclosure Schedule accurately and completely lists all repurchase or forfeiture rights held by the Company with respect to shares of Company Capital Stock (including shares issued pursuant to the exercise of stock options). Each share of Company Preferred Stock is convertible into one share of Company Common Stock.

(c) Except for as described in Section 2.6(c) of the Company Disclosure Schedule, the Company does not have any stock option plan or any other plan, program, agreement or arrangement providing for any

equity-based compensation for any Person. As of the date of this Agreement, the Company has reserved 8,600,000 shares of Company Common Stock for issuance under the Company Plans, of which 6,843,251 shares have been issued and are currently outstanding, 7,509,919 shares have been reserved for issuance upon exercise of Company Options previously granted under the Company Plans, and 1,090,081 shares of Company Common Stock remain available for future issuance of awards pursuant to the Company Plans. Section 2.6(c) of the Company Disclosure Schedule sets forth the following information with respect to each Company Option outstanding as of the date of this Agreement: (i) the name of the optionee; (ii) the number of shares of Company Common Stock subject to such Company Option at the time of grant; (iii) the number of shares of Company Common Stock subject to such Company Option as of the date of this Agreement; (iv) the exercise price of such Company Option; (v) the date on which such Company Option was granted; (vi) the applicable vesting schedule, including the number of vested and unvested shares as of the date of this Agreement and any acceleration provisions; (vii) the date on which such Company Option expires; and (viii) whether such Company Option is intended to constitute an "incentive stock option" (as defined in the Code) or a non-qualified stock option. The Company has made available to Parent an accurate and complete copy of the Company Plans and the form of stock option agreement used to evidence outstanding options granted thereunder.

(d) Except for Company Warrants, and the Company Options set forth on Section 2.6(c) of the Company Disclosure Schedule, there is no: (i) outstanding subscription, option, call, warrant or right (whether or not currently exercisable) to acquire any shares of the capital stock or other securities of the Company or any of its Subsidiaries; (ii) outstanding security, instrument or obligation that is or may become convertible into or exchangeable for any shares of the capital stock or other securities of the Company or any of its Subsidiaries; or (iii) condition or circumstance that is reasonably likely to give rise to or provide a basis for the assertion of a claim by any Person to the effect that such Person is entitled to acquire or receive any shares of capital stock or other securities of the Company or any of its Subsidiaries. There are no outstanding or authorized stock appreciation, phantom stock, profit participation or other similar rights with respect to the Company or any of its Subsidiaries.

(e) All outstanding shares of Company Common Stock, Company Preferred Stock, Company Options, Company Warrants, and other securities of the Company have been issued and granted in material compliance with (i) all applicable securities Laws and other applicable Law, and (ii) all requirements set forth in applicable Contracts.

2.7 **Financial Statements**.

(a) Concurrently with the execution hereof, the Company has provided to Parent true and complete copies of (i) the Company's audited consolidated balance sheets at December 31, 2017 and 2016 together with related audited consolidated statements of income, stockholders' equity and cash flows, and notes thereto, of the Company for the fiscal years then ended and (ii) the Company Unaudited Interim Balance Sheet, together with the unaudited consolidated statements of income, stockholders' equity and cash flows of the Company for the period reflected in the Company Unaudited Interim Balance Sheet (collectively, the "***Company Financials***"). The Company Financials were prepared in accordance with GAAP (except as may be indicated in the notes to such financial statements and except that the unaudited financial statements may not contain footnotes and are subject to normal and recurring year-end adjustments, none of which are material) and fairly present, in all material respects, the financial position and operating results of the Company and its consolidated Subsidiaries as of the dates and for the periods indicated therein.

(b) Each of the Company and its Subsidiaries maintains accurate books and records reflecting their assets and liabilities and maintains a system of internal accounting controls designed to provide reasonable assurance that: (i) transactions are executed in accordance with management's general or specific authorizations; (ii) transactions are recorded as necessary to permit preparation of the financial statements of the Company and its Subsidiaries and to maintain accountability of the Company's and its Subsidiaries' assets; (iii) access to the Company's and its Subsidiaries' assets is permitted only in accordance with management's general or specific

authorization; (iv) the recorded accountability for the Company's and its Subsidiaries' assets is compared with the existing assets at regular intervals and appropriate action is taken with respect to any differences; and (v) accounts, notes and other receivables and inventory are recorded accurately, and proper and adequate procedures are implemented to effect the collection thereof on a current and timely basis. The Company and each of its Subsidiaries maintains internal control over financial reporting that provides reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes.

(c) Section 2.7(c) of the Company Disclosure Schedule lists, and the Company has delivered to Parent accurate and complete copies of the documentation creating or governing, all securitization transactions and "off-balance sheet arrangements" (as defined in Item 303(c) of Regulation S-K under the Exchange Act) effected by the Company or any of its Subsidiaries since January 1, 2016.

(d) Since January 1, 2016, there have been no formal internal investigations regarding financial reporting or accounting policies and practices discussed with, reviewed by or initiated at the direction of the chief executive officer, chief financial officer or general counsel of the Company, the Company Board or any committee thereof. Since January 1, 2016, neither the Company nor its independent auditors have identified (i) any significant deficiency or material weakness in the design or operation of the system of internal accounting controls utilized by the Company and its Subsidiaries, (ii) any fraud, whether or not material, that involves the Company, any of its Subsidiaries, the Company's management or other employees who have a role in the preparation of financial statements or the internal accounting controls utilized by the Company and its Subsidiaries or (iii) any claim or allegation regarding any of the foregoing.

2.8 **Absence of Changes**. Except as set forth on Section 2.8 of the Company Disclosure Schedule, between the date of the Company Unaudited Interim Balance Sheet and the date of this Agreement, the Company has conducted its business only in the Ordinary Course of Business (except for the execution and performance of this Agreement and the discussions, negotiations and transactions related thereto) and there has not been any (a) Company Material Adverse Effect or (b) action, event or occurrence that would have required consent of Parent pursuant to Section 4.2(b) had such action, event or occurrence taken place after the execution and delivery of this Agreement.

2.9 **Absence of Undisclosed Liabilities**. As of the date hereof, neither the Company nor any of its Subsidiaries has any liability, indebtedness, obligation or expense of any kind, whether accrued, absolute, contingent, matured or unmatured (each a "***Liability***"), individually or in the aggregate, of a type required to be recorded or reflected on a balance sheet or disclosed in the footnotes thereto under GAAP, except for: (a) Liabilities disclosed, reflected or reserved against in the Company Unaudited Interim Balance Sheet; (b) Liabilities that have been incurred by the Company or its Subsidiaries since the date of the Company Unaudited Interim Balance Sheet in the Ordinary Course of Business; (c) Liabilities for performance of obligations of the Company or any of its Subsidiaries under Company Contracts; (d) Liabilities incurred in connection with the Contemplated Transactions; (e) Liabilities which would not, individually or in the aggregate, reasonably be expected to be material to the Company; and (f) Liabilities described in Section 2.9 of the Company Disclosure Schedule.

2.10 **Title to Assets**. Each of the Company and its Subsidiaries owns, and has good and valid title to, or, in the case of leased properties and assets, valid leasehold interests in, all tangible properties or tangible assets and equipment used or held for use in its business or operations or purported to be owned by it that are material to the Company or its business, including: (a) all tangible assets reflected on the Company Unaudited Interim Balance Sheet; and (b) all other tangible assets reflected in the books and records of the Company or any of its Subsidiaries as being owned by the Company or such Subsidiary. All of such assets are owned or, in the case of leased assets, leased by the Company or any of its Subsidiaries free and clear of any Encumbrances, other than Permitted Encumbrances.

2.11 **Real Property; Leasehold**. Neither the Company nor any of its Subsidiaries owns or has ever owned any real property. The Company has made available to Parent (a) an accurate and complete list of all real

properties with respect to which the Company directly or indirectly holds a valid leasehold interest as well as any other real estate that is in the possession of or leased by the Company or any of its Subsidiaries, and (b) copies of all leases under which any such real property is possessed (the "***Company Real Estate Leases***"), each of which is in full force and effect, with no existing material default thereunder. The Company's use and operation of each such leased property conforms to all applicable Laws in all material respects, and the Company has exclusive possession of each such leased property and has not granted any occupancy rights to tenants or licensees with respect to such leased property. In addition, each such leased property is free and clear of all Encumbrances other than Permitted Encumbrances.

2.12 **Intellectual Property**.

(a) Section 2.12(a) of the Company Disclosure Schedule identifies each item of material Company IP, including, with respect to each patent and patent application: (i) the name of the applicant/registrant, (ii) the jurisdiction of application/registration, (iii) the application or registration number and (iv) any other co-owners. To the Knowledge of the Company, each of the patents and patent applications included in Section 2.12(a) of the Company Disclosure Schedule properly identifies by name each and every inventor of the inventions claimed therein as determined in accordance with applicable Laws of the United States. To the knowledge of the Company, as of the date of this Agreement, no cancellation, interference, opposition, reissue, reexamination or other proceeding of any nature (other than office actions or similar communications issued by any Governmental Body in the ordinary course of prosecution of any pending applications for registration) is pending or threatened in writing, in which the scope, validity, enforceability or ownership of any Company IP is being or has been contested or challenged.

(b) Except as has not had and would not reasonably be expected to have, individually or in the aggregate, a Company Material Adverse Effect, the Company or its Subsidiaries owns, is the assignee of, or has licensed all material Company IP (other than as disclosed on Section 2.12(b) of the Company Disclosure Schedule), free and clear of all Encumbrances other than Permitted Encumbrances. To the Knowledge of the Company, each Company Associate involved in the creation or development of any material Company IP, pursuant to such Company Associate's activities on behalf of the Company or its Subsidiaries, has signed a written agreement containing an assignment of such Company Associate's rights in such Company IP to the Company or its Subsidiaries and confidentiality provisions protecting the Company IP.

(c) Except as set forth in Section 2.12(d) of the Company Disclosure Schedule, to the Knowledge of the Company, no funding, facilities or personnel of any Governmental Body or any university, college, research institute or other educational institution has been used to create Company IP, except for any such funding or use of facilities or personnel that does not result in such Governmental Body or institution obtaining ownership rights to such Company IP or the right to receive royalties for the practice of such Company IP.

(d) Section 2.12(d) of the Company Disclosure Schedule sets forth each license agreement pursuant to which the Company (i) is granted a license under any material Intellectual Property Right owned by any third party that is used by the Company or its Subsidiaries in its business as currently conducted (each a "***Company In-bound License***") or (ii) grants to any third party a license under any material Company IP or material Intellectual Property Right licensed to the Company or its Subsidiaries under a Company In-bound License (each a "***Company Out-bound License***") (*provided*, that, Company In-bound Licenses shall not include, when entered into in the ordinary course of business, material transfer agreements, clinical trial agreements, agreements with Company Associates, services agreements, non-disclosure agreements, commercially available Software-as-a-Service offerings, off-the-shelf software licenses or generally available patent license agreements; and Company Out-bound Licenses shall not include, when entered into in the ordinary course of business, material transfer agreements, clinical trial agreements, services agreements, non-disclosure agreements, or non-exclusive outbound licenses).

(e) To the Knowledge of the Company: (i) the operation of the businesses of the Company and its Subsidiaries as currently conducted does not infringe, misappropriate or otherwise violate any valid and enforceable United States patent that is not included on Section 2.12(a) of the Company Disclosure Schedule and (ii) no other Person is infringing, misappropriating or otherwise violating any Company IP. No Legal Proceeding is pending (or, to the Knowledge of the Company, is threatened in writing) (A) against the Company or its Subsidiaries alleging that the operation of the businesses of the Company or its Subsidiaries infringes or constitutes the misappropriation or other violation of any Intellectual Property Rights of another Person or (B) by the Company or its Subsidiaries alleging that another Person has infringed, misappropriated or otherwise violated any of the Company IP or any Intellectual Property Rights exclusively licensed to the Company or its Subsidiaries. Since January 1, 2017, neither the Company nor its Subsidiaries has received any written notice or other written communication alleging that the operation of the business of the Company or its Subsidiaries infringes or constitutes the misappropriation or other violation of any Intellectual Property Right of another Person.

(f) None of the Company IP or, to the Knowledge of the Company, any material Intellectual Property Rights exclusively licensed to the Company or its Subsidiaries is subject to any pending or outstanding injunction, directive, order, judgment or other disposition of dispute that adversely and materially restricts the use, transfer, registration or licensing by the Company or its Subsidiaries of any such Company IP or material Intellectual Property Rights exclusively licensed to the Company or its Subsidiaries.

(g) To the Knowledge of the Company, the Company, its Subsidiaries and the operation of the Company's and its Subsidiaries' business are in substantial compliance with all Laws pertaining to data privacy and data security of any personally identifiable information and sensitive business information (collectively, "***Sensitive Data***") except to the extent that such noncompliance has not and would not reasonably be expected to have a Company Material Adverse Effect. To the Knowledge of the Company, since January 1, 2017, there have been (i) no material losses or thefts of data or security breaches relating to Sensitive Data used in the business of the Company or its Subsidiaries, (ii) no violations of any security policy of the Company regarding any such Sensitive Data used in the business of the Company or its Subsidiaries, and (iii) no unauthorized access, unauthorized use or unintended or improper disclosure of any Sensitive Data used in the business of the Company or its Subsidiaries, in each case of (i) through (iii), except as would not reasonably be expected to, individually or in the aggregate, have a Company Material Adverse Effect.

2.13 **Agreements, Contracts and Commitments**.

(a) Section 2.13(a) of the Company Disclosure Schedule lists the following Company Contracts in effect as of the date of this Agreement other than any Benefit Plans (each, a "***Company Material Contract***" and collectively, the "***Company Material Contracts***"):

(i) each Company Contract relating to any agreement of indemnification or guaranty not entered into in the Ordinary Course of Business;

(ii) each Company Contract containing (A) any covenant limiting the freedom of the Company, its Subsidiaries or the Surviving Corporation to engage in any line of business or compete with any Person, (B) any most-favored pricing arrangement, (C) any exclusivity provision, or (D) any non-solicitation provision with respect to employees of other Persons, in each case, except for restrictions that would not materially affect the ability of the Company to conduct its business;

(iii) each Company Contract relating to capital expenditures and requiring payments after the date of this Agreement in excess of $250,000 pursuant to its express terms and not cancelable without penalty;

(iv) each Company Contract relating to the disposition or acquisition of material assets or any ownership interest in any Entity, in each case, involving payments in excess of $250,000,

other than Company Contracts in which the applicable acquisition or disposition has been consummated and there are no material ongoing obligations;

(v) each Company Contract relating to any mortgages, indentures, loans, notes or credit agreements, security agreements or other agreements or instruments relating to the borrowing of money or extension of credit or creating any material Encumbrances with respect to any assets of the Company or any of its Subsidiaries or any loans or debt obligations with officers or directors of the Company, in each case, having an outstanding principal in an amount in excess of $250,000.;

(vi) each Company Contract requiring payment by or to the Company after the date of this Agreement in excess of $250,000 pursuant to its express terms relating to: (A) any distribution agreement (identifying any that contain exclusivity provisions); (B) any agreement involving provision of services or products with respect to any pre-clinical or clinical development activities of the Company; (C) any dealer, distributor, joint marketing, alliance, joint venture, cooperation, development or other agreement currently in force under which the Company has continuing obligations to develop or market any product, technology or service, or any agreement pursuant to which the Company has continuing obligations to develop any Intellectual Property Rights that will not be owned, in whole or in part, by the Company; or (D) any Contract to license any third party to manufacture or produce any product, service or technology of the Company or any Contract to sell, distribute or commercialize any products or service of the Company, in each case, except for Company Contracts entered into in the Ordinary Course of Business;

(vii) each Company Contract with any financial advisor, broker, finder, investment banker or other similar Person, providing advisory services to the Company in connection with the Contemplated Transactions;

(viii) each Company Real Estate Lease;

(ix) each Company Contract with any Governmental Body (other than clinical trial agreements for clinical trial studies);

(x) each Company Out-bound License and Company In-bound License;

(xi) each Company Contract containing any royalty, dividend or similar arrangement based on the revenues or profits of the Company or any of its Subsidiaries;

(xii) each Company Contract, offer letter, employment agreement, or independent contractor agreement with any employee, consultant or independent contractor that (A) is not terminable by the Company without less than 60 days notice, severance, or other cost or liability, or (B) provides for retention payments, change of control payments, severance, accelerated vesting, or any payment or benefit that may or will become due as a result of the Merger (whether alone or in connection with any other event); or

(xiii) any other Company Contract that is not terminable at will (with no penalty or payment) by the Company or its Subsidiaries, as applicable, and (A) which involves payment or receipt by the Company or its Subsidiaries after the date of this Agreement under any such agreement, contract or commitment of more than $250,000 in the aggregate, or obligations after the date of this Agreement in excess of $250,000 in the aggregate, or (B) that is material to the business or operations of the Company and its Subsidiaries, taken as a whole.

(b) The Company has delivered or made available to Parent accurate and complete copies of all Company Material Contracts, including all amendments thereto. Except as set forth in Section 2.13(b) of the Company Disclosure Schedule, there are no Company Material Contracts that are not in written form. Neither the Company nor any of its Subsidiaries has, nor to the Company's Knowledge, as of the date of this Agreement has any other party to a Company Material Contract, breached, violated or defaulted under, or received notice that it

breached, violated or defaulted under, any of the terms or conditions of any Company Material Contract in such manner as would permit any other party to cancel or terminate any such Company Material Contract, or would permit any other party to seek damages which would reasonably be expected to be material to the Company or its business. As to the Company and its Subsidiaries, as of the date of this Agreement, each Company Material Contract is valid, binding, enforceable and in full force and effect, subject to the Enforceability Exceptions. No Person is renegotiating, or has a right pursuant to the terms of any Company Material Contract to change, any material amount paid or payable to the Company under any Company Material Contract or any other material term or provision of any Company Material Contract.

2.14 **Compliance; Permits; Restrictions**.

(a) The Company and each of its Subsidiaries are, and since January 1, 2016 have been, in compliance in all material respects with all applicable Laws, including the Federal Food, Drug, and Cosmetic Act ("***FDCA***"), the Food and Drug Administration ("***FDA***") regulations adopted thereunder, the Public Health Service Act and any other similar Law administered or promulgated by the FDA or other comparable Governmental Body responsible for regulation of the development, clinical testing, manufacturing, sale, marketing, distribution and importation or exportation of drug and biopharmaceutical products (each, a "***Drug Regulatory Agency***"), except for any noncompliance, either individually or in the aggregate, which would not be material to the Company. No investigation, claim, suit, proceeding, audit or other action by any Governmental Body is pending or, to the Knowledge of the Company, threatened against the Company or any of its Subsidiaries. There is no agreement, judgment, injunction, order or decree binding upon the Company or any of its Subsidiaries which (i) has or would reasonably be expected to have the effect of prohibiting or materially impairing any business practice of the Company or any of its Subsidiaries, any acquisition of material property by the Company or any of its Subsidiaries or the conduct of business by the Company or any of its Subsidiaries as currently conducted, (ii) is reasonably likely to have an adverse effect on the Company's ability to comply with or perform any covenant or obligation under this Agreement, or (iii) is reasonably likely to have the effect of preventing, delaying, making illegal or otherwise interfering with the Contemplated Transactions.

(b) The Company and its Subsidiaries hold all required Governmental Authorizations which are material to the operation of the business of the Company and its Subsidiaries as currently conducted (the "***Company Permits***"). Section 2.14(b) of the Company Disclosure Schedule identifies each Company Permit. Each of the Company and its Subsidiaries is in material compliance with the terms of the Company Permits. No Legal Proceeding is pending or, to the Knowledge of the Company, threatened, which seeks to revoke, limit, suspend, or materially modify any Company Permit. The rights and benefits of each Company Permit will be available to the Surviving Corporation or its Subsidiaries, as applicable, immediately after the Effective Time on terms substantially identical to those enjoyed by the Company and its Subsidiaries as of the date of this Agreement and immediately prior to the Effective Time.

(c) There are no proceedings pending or, to the Knowledge of the Company, threatened against the Company with respect to an alleged material violation by the Company or any of its Subsidiaries of the FDCA, FDA regulations adopted thereunder, the Public Health Service Act or any other similar Law administered or promulgated by any Drug Regulatory Agency.

(d) All clinical, pre-clinical and other studies and tests conducted by or on behalf of, or sponsored by, the Company or its Subsidiaries, or in which the Company or its Subsidiaries or their respective current products or product candidates have participated, were and, if still pending, are being conducted in all material respects in accordance with standard medical and scientific research procedures and in compliance in all material respects with the applicable regulations of any applicable Drug Regulatory Agency and other applicable Law, as applicable, including 21 C.F.R. Parts 50, 54, 56, 58 and 312. No preclinical or clinical trial conducted by or on behalf of the Company or any of its Subsidiaries has been terminated or suspended prior to completion for safety or non-compliance reasons. Since January 1, 2016, neither the Company nor any of its Subsidiaries has received any notices, correspondence, or other communications from any Drug Regulatory Agency requiring, or

to the Knowledge of the Company threatening to initiate, the termination or suspension of any clinical studies conducted by or on behalf of, or sponsored by, the Company or any of its Subsidiaries or in which the Company or any of its Subsidiaries or their respective current products or product candidates have participated.

(e) Neither the Company nor any of its Subsidiaries is the subject of any pending or, to the Knowledge of the Company, threatened investigation in respect of its business or products by the FDA pursuant to its "Fraud, Untrue Statements of Material Facts, Bribery, and Illegal Gratuities" Final Policy set forth in 56 Fed. Reg. 46191 (September 10, 1991) and any amendments thereto. To the Knowledge of the Company, neither the Company nor any of its Subsidiaries has committed any acts, made any statement, or failed to make any statement, in each case in respect of its business or products that would violate the FDA's "Fraud, Untrue Statements of Material Facts, Bribery, and Illegal Gratuities" Final Policy, and any amendments thereto. None of the Company, any of its Subsidiaries or any of their respective officers, employees or, to the Knowledge of the Company, agents has been convicted of any crime or engaged in any conduct that could result in a debarment or exclusion (i) under 21 U.S.C. Section 335a or (ii) any similar applicable Law. No debarment or exclusionary claims, actions, proceedings or investigations in respect of their business or products are pending or, to the Knowledge of the Company, threatened against the Company, any of its Subsidiaries or any of their respective officers, employees or, to the Knowledge of the Company, agents.

(f) The Company and its Subsidiaries have complied with all Laws relating to patient, medical or individual health information, including the Health Insurance Portability and Accountability Act of 1996 and its implementing regulations promulgated thereunder, all as amended from time to time (collectively "***HIPAA***"), including the standards for the privacy of Individually Identifiable Health Information at 45 C.F.R. Parts 160 and 164, Subparts A and E, the standards for the protection of Electronic Protected Health Information set forth at 45 C.F.R. Part 160 and 45 C.F.R. Part 164, Subpart A and Subpart C, the standards for transactions and code sets used in electronic transactions at 45 C.F.R. Part 160, Subpart A and Part 162, and the standards for Breach Notification for Unsecured Protected Health Information at 45 C.F.R. Part 164, Subpart D, all as amended from time to time. The Company and its Subsidiaries have entered into, where required, and are in compliance in all material respects with the terms of all Business Associate (as defined in HIPAA) agreements ("***Business Associate Agreements***") to which the Company or a Subsidiary is a party or otherwise bound. The Company and its Subsidiaries have created and maintained written policies and procedures to protect the privacy of all protected health information, provide training to all employees and agents as required under HIPAA, and have implemented security procedures, including physical, technical and administrative safeguards, to protect all personal information and Protected Health Information stored or transmitted in electronic form. Neither the Company nor its Subsidiaries have received written notice from the Office for Civil Rights for the U.S. Department of Health and Human Services or any other Governmental Body of any allegation regarding its failure to comply with HIPAA or any other state law or regulation applicable to the protection of individually identifiable health information or personally identifiable information. No successful Security Incident, Breach of Unsecured Protected Health Information or breach of personally identifiable information under applicable state or federal laws have occurred with respect to information maintained or transmitted to the Company, any of its Subsidiaries, or an agent or third party subject to a Business Associate Agreement with the Company or a Subsidiary of the Company. The Company is currently submitting, receiving and handling or is capable of submitting receiving and handling transactions in accordance with the Standard Transaction Rule. All capitalized terms in this Section 2.14(f) not otherwise defined in this Agreement shall have the meanings set forth under HIPAA.

2.15 **Legal Proceedings; Orders**.

(a) As of the date of this Agreement, there is no material pending Legal Proceeding and, to the Knowledge of the Company, no Person has threatened in writing to commence any Legal Proceeding: (i) that involves (A) the Company, (B) any of its Subsidiaries, (C) any Company Associate (in his or her capacity as such) or (D) any of the material assets owned or used by the Company or its Subsidiaries; or (ii) that challenges, or that would have the effect of preventing, delaying, making illegal or otherwise interfering with, the Contemplated Transactions.

(b) Except as set forth in Section 2.15(b) of the Company Disclosure Schedule, since January 1, 2016 through the date of this Agreement, no Legal Proceeding has been pending against the Company that resulted in material liability to the Company.

(c) There is no order, writ, injunction, judgment or decree to which the Company or any of its Subsidiaries, or any of the material assets owned or used by the Company or any of its Subsidiaries, is subject. To the Knowledge of the Company, no officer of the Company or any of its Subsidiaries is subject to any order, writ, injunction, judgment or decree that prohibits such officer or employee from engaging in or continuing any conduct, activity or practice relating to the business of the Company or any of its Subsidiaries or to any material assets owned or used by the Company or any of its Subsidiaries.

2.16 **Tax Matters.**

(a) The Company and each of its Subsidiaries have timely filed all income Tax Returns and other material Tax Returns that they were required to file under applicable Law. All such Tax Returns are correct and complete in all material respects and have been prepared in compliance with all applicable Law. No claim has ever been made by any Governmental Body in any jurisdiction where the Company or any of its Subsidiaries does not file a particular Tax Return or pay a particular Tax that the Company or such Subsidiary is subject to taxation by that jurisdiction.

(b) All income and other material Taxes due and owing by the Company or any of its Subsidiaries on or before the date hereof (whether or not shown on any Tax Return) have been fully paid. The unpaid Taxes of the Company and its Subsidiaries did not, as of the date of the Company Unaudited Interim Balance Sheet, materially exceed the reserve for Tax liability (excluding any reserve for deferred Taxes established to reflect timing differences between book and Tax items) set forth on the face of the Company Unaudited Interim Balance Sheet. Since the date of the Company Unaudited Interim Balance Sheet, neither the Company nor any of its Subsidiaries has incurred any material Liability for Taxes outside the Ordinary Course of Business.

(c) All Taxes that the Company or any of its Subsidiaries are or were required by Law to withhold or collect have been duly and timely withheld or collected in all material respects on behalf of its respective employees, independent contractors, stockholders, lenders, customers or other third parties and, have been timely paid to the proper Governmental Body or other Person or properly set aside in accounts for this purpose.

(d) There are no Encumbrances for material Taxes (other than Permitted Encumbrances) upon any of the assets of the Company or any of its Subsidiaries.

(e) No deficiencies for income or other material Taxes with respect to the Company or any of its Subsidiaries have been claimed, proposed or assessed by any Governmental Body in writing. There are no pending or ongoing, and to the Knowledge of the Company, threatened audits, assessments or other actions for or relating to any liability in respect of a material amount of Taxes of the Company or any of its Subsidiaries. Neither the Company nor any of its Subsidiaries (or any of their predecessors) has waived any statute of limitations in respect of any income or other material Taxes or agreed to any extension of time with respect to any income or other material Tax assessment or deficiency.

(f) The Company has not been a United States real property holding corporation within the meaning of Section 897(c)(2) of the Code during the applicable period specified in Section 897(c)(1)(A)(ii) of the Code.

(g) Neither the Company nor any of its Subsidiaries is a party to any Tax allocation agreement, Tax sharing agreement, Tax indemnity agreement, or similar agreement or arrangement, other than customary commercial contracts entered into in the Ordinary Course of Business the principal subject matter of which is not Taxes.

(h) Neither the Company nor any of its Subsidiaries will be required to include any material item of income in, or exclude any material item of deduction from, taxable income for any Tax period (or portion thereof) ending after the Closing Date as a result of any: (i) change in method of accounting for Tax purposes filed on or prior to the Closing Date; (ii) use of an improper method of accounting for a Tax period ending on or prior to the Closing Date; (iii) "closing agreement" as described in Section 7121 of the Code (or any similar provision of state, local or foreign Law) executed on or prior to the Closing Date; (iv) intercompany transaction or excess loss account described in Treasury Regulations under Section 1502 of the Code (or any similar provision of state, local or foreign Law) entered into on or prior to the Closing Date; (v) installment sale or open transaction disposition made on or prior to the Closing Date; (vi) prepaid amount received on or prior to the Closing Date; or (vii) election under Section 108(i) of the Code (or any similar provision of state, local or foreign Law) made on or prior to the Closing Date. The Company has not made any election under Section 965(h) of the Code.

(i) Neither the Company nor any of its Subsidiaries has ever been (i) a member of a consolidated, combined or unitary Tax group (other than such a group the common parent of which is the Company) or (ii) a party to any joint venture, partnership, or other arrangement that is treated as a partnership for U.S. federal income Tax purposes. Neither the Company nor any of its Subsidiaries has any Liability for any material Taxes of any Person (other than the Company and any of its Subsidiaries) under Treasury Regulations Section 1.1502-6 (or any similar provision of state, local, or foreign Law), or as a transferee or successor.

(j) Neither the Company nor any of its Subsidiaries has, since January 1, 2017, distributed stock of another Person, or had its stock distributed by another Person, in a transaction that was purported or intended to be governed in whole or in part by Section 355 of the Code or Section 361 of the Code (or any similar provisions of state, local or foreign Law).

(k) Neither the Company nor any of its Subsidiaries (i) is a "controlled foreign corporation" as defined in Section 957 of the Code; (ii) is a "passive foreign investment company" within the meaning of Section 1297 of the Code; (iii) has ever had a permanent establishment (within the meaning of an applicable Tax treaty) or otherwise had an office or fixed place of business in a country other than the country in which it is organized; (iv) is or was a "surrogate foreign corporation" within the meaning of Section 7874(a)(2)(B) or is treated as a U.S. corporation under Section 7874(b) of the Code; or (v) was created or organized in the U.S. such that such entity would be taxable in the U.S. as a domestic entity pursuant to the dual charter provision of Treasury Regulations Section 301.7701-5(a).

(l) Neither the Company nor any of its Subsidiaries has participated in or been a party to a transaction that, as of the date of this Agreement, constitutes a "listed transaction" that is required to be reported to the IRS pursuant to Section 6011 of the Code and applicable Treasury Regulations thereunder.

(m) Neither the Company nor any of its Subsidiaries has taken or agreed to take any action or knows of any fact that would reasonably be expected to prevent the Merger from qualifying for the Intended Tax Treatment.

For purposes of this Section 2.16, each reference to the Company or any of its Subsidiaries shall be deemed to include any Person that was liquidated into, merged with, or is otherwise a predecessor to, the Company or such Subsidiary, respectively.

2.17 **Employee and Labor Matters; Benefit Plans**.

(a) Section 2.17(a) of the Company Disclosure Schedule is a list of all Company Benefit Plans, including, without limitation, each Company Benefit Plan that provides for retirement, change in control, stay or retention, deferred compensation, incentive compensation, severance or retiree medical or life insurance benefits. "***Company Benefit Plan***" means each (i) "employee benefit plan" as defined in Section 3(3) of ERISA and

(ii) other pension, retirement, deferred compensation, excess benefit, profit sharing, bonus, incentive, equity or equity-based (other than individual Company Options made pursuant to the Company's standard forms, in which case only representative standard forms of such stock option agreements shall be scheduled), phantom equity, employment, offer letter, consulting, severance, change-of-control, retention, health, life, disability, group insurance, paid-time off, holiday, welfare and fringe benefit plan, program, agreement, contract, or arrangement (whether written or unwritten, qualified or nonqualified, funded or unfunded and including any that have been frozen), in any case, maintained, contributed to, or required to be contributed to, by the Company or any of its Subsidiaries or Company ERISA Affiliates for the benefit of any current or former employee, director, officer or independent contractor of the Company or any of its Subsidiaries or under which the Company or any of its Subsidiaries has any actual or contingent liability (including, without limitation, as to the result of it being treated as a single employer under Code Section 414 with any other person).

(b) As applicable with respect to each Company Benefit Plan, the Company has made available to Parent, true and complete copies of (i) each Company Benefit Plan, including all amendments thereto, and in the case of an unwritten Company Benefit Plan, a written description thereof, (ii) all current trust documents, investment management contracts, custodial agreements, administrative services agreements and insurance and annuity contracts relating thereto, (iii) the current summary plan description and each summary of material modifications thereto, (iv) the most recently filed annual reports with any Governmental Body (*e.g.*, Form 5500 and all schedules thereto), (v) the most recent IRS determination, opinion or advisory letter, (vi) the most recent summary annual reports, nondiscrimination testing reports, actuarial reports, financial statements and trustee reports, (vii) all records, notices and filings concerning IRS or Department of Labor or other Governmental Body audits or investigations, "prohibited transactions" within the meaning of Section 406 of ERISA or Section 4975 of the Code, (viii) all policies and procedures established to comply with the privacy and security rules of HIPAA and (ix) any written reports constituting a valuation of the Company's capital stock for purposes of Sections 409A or 422 of the Code, whether prepared internally by the Company or by an outside, third-party valuation firm.

(c) Each Company Benefit Plan has been maintained, operated and administered in compliance in all material respects with its terms and any related documents or agreements and the applicable provisions of ERISA, the Code and all other Laws.

(d) The Company Benefit Plans which are "employee pension benefit plans" within the meaning of Section 3(2) of ERISA and which are intended to meet the qualification requirements of Section 401(a) of the Code have received determination or opinion letters from the IRS on which they may currently rely to the effect that such plans are qualified under Section 401(a) of the Code and the related trusts are exempt from federal income Taxes under Section 501(a) of the Code, respectively, and to the Knowledge of the Company, nothing has occurred that would reasonably be expected to materially adversely affect the qualification of such Company Benefit Plan or the tax exempt status of the related trust.

(e) Neither the Company, any of its Subsidiaries nor any Company ERISA Affiliate maintains, contributes to, is required to contribute to, or has any actual or contingent liability with respect to, (i) any "employee pension benefit plan" (within the meaning of Section 3(2) of ERISA) that is subject to Title IV or Section 302 of ERISA or Section 412 of the Code, (ii) any "multiemployer plan" (within the meaning of Section 3(37) of ERISA), (iii) any "multiple employer plan" (within the meaning of Section 413 of the Code) or (iv) any "multiple employer welfare arrangement" (within the meaning of Section 3(40) of ERISA).

(f) There are no pending audits or investigations by any Governmental Body involving any Company Benefit Plan, and no pending or, to the Knowledge of the Company, threatened claims (except for individual claims for benefits payable in the normal operation of the Company Benefit Plans), suits or proceedings involving any Company Benefit Plan, any fiduciary thereof or service provider thereto, in any case except as would not be reasonably expected to result in material liability to the Company or any of its Subsidiaries. All contributions and premium payments required to have been made under any of the Company

Benefit Plans or by applicable Law (without regard to any waivers granted under Section 412 of the Code), have been timely made in all material respects and neither the Company nor any Company ERISA Affiliate has any material liability for any unpaid contributions with respect to any Company Benefit Plan.

(g) Neither the Company, any of its Subsidiaries or Company ERISA Affiliates, nor to the Knowledge of the Company, any fiduciary, trustee or administrator of any Company Benefit Plan, has engaged in, or in connection with the Contemplated Transactions will engage in, any transaction with respect to any Company Benefit Plan which would subject any such Company Benefit Plan, the Company, any of its Subsidiaries or Company ERISA Affiliates or Parent to a material Tax, material penalty or material liability for a "prohibited transaction" under Section 406 of ERISA or Section 4975 of the Code.

(h) Except as provided in Section 2.17(h) of the Company Disclosure Schedule, no Company Benefit Plan provides death, medical, dental, vision, life insurance or other welfare benefits beyond termination of service or retirement other than coverage mandated by Law and neither the Company nor any of its Subsidiaries or Company ERISA Affiliates has made a written or oral representation promising the same.

(i) Neither the execution of, nor the performance of the Contemplated Transactions will either alone or in connection with any other event(s) (i) result in any payment becoming due to any current or former employee, director, officer, or independent contractor of the Company or any Subsidiary thereof, (ii) increase any amount of compensation or benefits otherwise payable under any Company Benefit Plan, (iii) result in the acceleration of the time of payment, funding or vesting of any benefits under any Company Benefit Plan, (iv) require any contribution or payment to fund any obligation under any Company Benefit Plan or (v) limit the right to merge, amend or terminate any Company Benefit Plan.

(j) Neither the execution of, nor the consummation of the Contemplated Transactions (either alone or when combined with the occurrence of any other event, including without limitation, a termination of employment) will result in the receipt or retention by any person who is a "disqualified individual" (within the meaning of Code Section 280G) with respect to the Company and its Subsidiaries of any payment or benefit that is or could be characterized as a "parachute payment" (within the meaning of Code Section 280G), determined without regard to the application of Code Section 280G(b)(5).

(k) The exercise price of each Company Option is not and never has been less than the fair market value of one share of Company Common Stock as of the grant date of such Company Option.

(l) Each Company Benefit Plan providing for deferred compensation that constitutes a "nonqualified deferred compensation plan" (as defined in Section 409A(d)(1) of the Code and the regulations promulgated thereunder) is, and has been, established, administered and maintained in compliance with the requirements of Section 409A of the Code and the regulations promulgated thereunder in all material respects.

(m) No current or former employee, officer, director or independent contractor of the Company or any of its Subsidiaries has any "gross up" agreements with the Company or any of its Subsidiaries or other assurance of reimbursement by the Company or any of its Subsidiaries for any Taxes imposed under Code Section 409A or Code Section 4999.

(n) No Company Benefit Plan is maintained outside of the United States.

(o) The Company has provided to Parent a true and correct list, as of the date of this Agreement, containing the names of all full-time, part-time or temporary employees and independent contractors (and indication as such), and, as applicable: (i) the annual dollar amount of all compensation (including wages, salary or fees, commissions, director's fees, fringe benefits, bonuses, profit sharing payments, and other payments or benefits of any type) payable to each person; (ii) dates of employment or service; (iii) title; (iv) any eligibility to receive severance, retention payment, change of control payment, or other similar compensation; (v) visa status, if applicable; and (vi) with respect to employees, a designation of whether they are classified as exempt or non-exempt for purposes of the Fair Labor Standards Act, as amended ("***FLSA***") and any similar state law.

(p) Neither the Company nor any of its Subsidiaries is or has ever been a party to, bound by, or has a duty to bargain under, any collective bargaining agreement or other Contract with a labor union, labor organization, or similar Person representing any of its employees, and there is no labor union, labor organization, or similar Person representing or, to the Knowledge of the Company, purporting to represent or seeking to represent any employees of the Company or its Subsidiaries, including through the filing of a petition for representation election. There is not and has not been in the past three years, nor is there or has there been in the past three years any threat of, any strike, slowdown, work stoppage, lockout, union election petition, demand for recognition, or any similar activity or dispute, or, to the Knowledge of the Company, any union organizing activity, against the Company or any of its Subsidiaries. No event has occurred, and no condition or circumstance exists, that might directly or indirectly be likely to give rise to or provide a basis for the commencement of any such strike, slowdown, work stoppage, lockout, union election petition, demand for recognition, any similar activity or dispute, or, to the Knowledge of the Company, any union organizing activity.

(q) The Company and each of its Subsidiaries is, and since January 1, 2016 has been, in material compliance with all applicable Laws respecting labor, employment, employment practices, and terms and conditions of employment, including worker classification, discrimination, harassment and retaliation, equal employment opportunities, fair employment practices, meal and rest periods, immigration, employee safety and health, payment of wages (including overtime wages), unemployment and workers' compensation, leaves of absence, and hours of work. Except as would not be reasonably likely to result in a material liability to the Company or any of its Subsidiaries, with respect to employees of the Company and its Subsidiaries, each of the Company and its Subsidiaries, since January 1, 2016: (i) has withheld and reported all amounts required by Law or by agreement to be withheld and reported with respect to wages, salaries and other payments, benefits, or compensation to employees, (ii) is not liable for any arrears of wages (including overtime wages), severance pay or any Taxes or any penalty for failure to comply with any of the foregoing, and (iii) is not liable for any payment to any trust or other fund governed by or maintained by or on behalf of any Governmental Body, with respect to unemployment compensation benefits, disability, social security or other benefits or obligations for employees (other than routine payments to be made in the Ordinary Course of Business). There are no actions, suits, claims, charges, lawsuits, investigations, audits or administrative matters pending or, to the Knowledge of the Company, threatened or reasonably anticipated against the Company or any of its Subsidiaries relating to any employee, applicant for employment, consultant, employment agreement or Company Benefit Plan (other than routine claims for benefits).

(r) Except as would not be reasonably likely to result in a material liability to the Company or any of its Subsidiaries, with respect to each individual who currently renders services to the Company or any of its Subsidiaries, the Company and each of its Subsidiaries has accurately classified each such individual as an employee, independent contractor, or otherwise under all applicable Laws and, for each individual classified as an employee, the Company and each of its Subsidiaries has accurately classified him or her as exempt or non-exempt under all applicable Laws. Neither the Company nor any of its Subsidiaries has any material liability with respect to any misclassification of: (a) any Person as an independent contractor rather than as an employee, (b) any employee leased from another employer, or (c) any employee currently or formerly classified as exempt under all applicable Laws.

(s) Within the preceding five (5) years, the Company has not implemented any "plant closing" or "mass layoff" of employees that would reasonably be expected to require notification under the WARN Act or any similar state or local Law, no such "plant closing" or "mass layoff" will be implemented before the Closing Date without advance notification to and approval of Parent, and there has been no "employment loss" as defined by the WARN Act within the ninety (90) days prior to the Closing Date.

(t) There is no Legal Proceeding, claim, unfair labor practice charge or compliant, labor dispute or grievance pending or, to the Knowledge of the Company, threatened against the Company relating to labor, employment, employment practices, or terms and conditions of employment.

2.18 **Environmental Matters.** The Company and each of its Subsidiaries are and since January 1, 2013 have complied with all applicable Environmental Laws, which compliance includes the possession by the Company of all permits and other Governmental Authorizations required under applicable Environmental Laws and compliance with the terms and conditions thereof, except for any failure to be in such compliance that, either individually or in the aggregate, would not reasonably be expected to be material to the Company or its business. Neither the Company nor any of its Subsidiaries has received since January 1, 2013 (or prior to that time, which is pending and unresolved), any written notice or other communication (in writing or otherwise), whether from a Governmental Body or other Person, that alleges that the Company or any of its Subsidiaries is not in compliance with or has liability pursuant to any Environmental Law and, to the Knowledge of the Company, there are no circumstances that would reasonably be expected to prevent or interfere with the Company's or any of its Subsidiaries' compliance in any material respects with any Environmental Law, except where such failure to comply would not reasonably be expected to be material to the Company or its business. No current or (during the time a prior property was leased or controlled by the Company or any of its Subsidiaries) prior property leased or controlled by the Company or any of its Subsidiaries has had a release of or exposure to Hazardous Materials in material violation of or as would reasonably be expected to result in any material liability of the Company or any of its Subsidiaries pursuant to Environmental Law. No consent, approval or Governmental Authorization of or registration or filing with any Governmental Body is required by Environmental Laws in connection with the execution and delivery of this Agreement or the Contemplated Transactions. Prior to the date hereof, the Company has provided or otherwise made available to Parent true and correct copies of all material environmental reports, assessments, studies and audits in the possession or control of the Company or any of its Subsidiaries with respect to any property leased or controlled by the Company or any of its Subsidiaries or any business operated by them.

2.19 **Insurance**. The Company has delivered or made available to Parent accurate and complete copies of all material insurance policies and all material self-insurance programs and arrangements relating to the business, assets, liabilities and operations of the Company and each of its Subsidiaries. Each of such insurance policies is in full force and effect and the Company and each of its Subsidiaries are in compliance in all material respects with the terms thereof. Other than customary end of policy notifications from insurance carriers, since January 1, 2016, neither the Company nor any of its Subsidiaries has received any notice or other communication regarding any actual or possible: (i) cancellation or invalidation of any insurance policy; or (ii) refusal or denial of any coverage, reservation of rights or rejection of any material claim under any insurance policy. The Company and each of its Subsidiaries have provided timely written notice to the appropriate insurance carrier(s) of each Legal Proceeding that is currently pending against the Company or any of its Subsidiaries for which the Company or such Subsidiary has insurance coverage, and no such carrier has issued a denial of coverage or a reservation of rights with respect to any such Legal Proceeding, or informed the Company or any of its Subsidiaries of its intent to do so.

2.20 **No Financial Advisors**. Except as set forth on Section 2.20 of the Company Disclosure Schedule, no broker, finder or investment banker is entitled to any brokerage fee, finder's fee, opinion fee, success fee, transaction fee or other fee or commission in connection with the Contemplated Transactions based upon arrangements made by or on behalf of the Company or any of its Subsidiaries.

2.21 **Disclosure**. The information supplied by the Company and each of its Subsidiaries for inclusion in the Proxy Statement (including any of the Company Financials) will not, as of the date of the Proxy Statement or as of the date such information is first mailed to Parent stockholders, (i) contain any statement that is inaccurate or misleading with respect to any material facts, or (ii) omit to state any material fact necessary in order to make such information, in light of the circumstances under which such information will be provided, not false or misleading.

2.22 **Transactions with Affiliates**.

(a) Section 2.22(a) of the Company Disclosure Schedule (i) describes any material transactions or relationships, since January 1, 2016, between, on one hand, the Company or any of its Subsidiaries and, on the other hand, any (A) executive officer or director of the Company or, to the Knowledge of the Company, any of its Subsidiaries or any of such executive officer's or director's immediate family members, (B) owner of more

than 5% of the voting power of the outstanding Company Capital Stock or (C) to the Knowledge of the Company, any "related person" (within the meaning of Item 404 of Regulation S-K under the Securities Act) of any such officer, director or owner (other than the Company or its Subsidiaries) in the case of each of (A), (B) or (C) that is of the type that would be required to be disclosed under Item 404 of Regulation S-K under the Securities Act; and (ii) identifies each Person who is (or who may be deemed to be) an Affiliate of the Company as of the date of this Agreement.

(b) Section 2.22(b) of the Company Disclosure Schedule lists each stockholders agreement, voting agreement, registration rights agreement, co-sale agreement or other similar Contract between the Company and any holders of Company Capital Stock, including any such Contract granting any Person investor rights, rights of first refusal, rights of first offer, registration rights, director designation rights or similar rights (collectively, the "***Investor Agreements***").

2.23 **Anti-Bribery**. None of the Company or any of its Subsidiaries or any of their respective directors, officers, employees or, to the Company's Knowledge, agents or any other Person acting on their behalf has directly or indirectly made any bribes, rebates, payoffs, influence payments, kickbacks, illegal payments, illegal political contributions, or other payments, in the form of cash, gifts, or otherwise, or taken any other action, in violation of the Foreign Corrupt Practices Act of 1977, the UK Bribery Act of 2010 or any other anti-bribery or anti-corruption Law (collectively, the "***Anti-Bribery Laws***"). Neither the Company nor any of its Subsidiaries is or has been the subject of any investigation or inquiry by any Governmental Body with respect to potential violations of Anti-Bribery Laws.

2.24 **Disclaimer of Other Representations or Warranties**.

(a) Except as previously set forth in this Section 2 or in any certificate delivered by the Company to Parent and/or Merger Sub pursuant to this Agreement, the Company makes no representation or warranty, express or implied, at law or in equity, with respect to it or any of its assets, liabilities or operations, and any such other representations or warranties are hereby expressly disclaimed.

(b) The Company acknowledges and agrees that, except for the representations and warranties of Parent and Merger Sub set forth in Section 3, none of Parent, Merger Sub or any of their respective Representatives is relying on any other representation or warranty of Parent or any other Person made outside of Section 3, including regarding the accuracy or completeness of any such other representations or warranties or the omission of any material information, whether express or implied, in each case, with respect to the Contemplated Transactions.

Section 3. REPRESENTATIONS AND WARRANTIES OF PARENT AND MERGER SUB

Subject to Section 10.13(h), except (a) as set forth in the disclosure schedule delivered by Parent to the Company (the "***Parent Disclosure Schedule***") or (b) as disclosed in the Parent SEC Documents filed with the SEC prior to the date hereof and publicly available on the SEC's Electronic Data Gathering Analysis and Retrieval system (but (i) without giving effect to any amendment thereof filed with, or furnished to the SEC on or after the date hereof and (ii) excluding any disclosures contained under the heading "Risk Factors" and any disclosure of risks included in any "forward-looking statements" disclaimer or in any other section to the extent they are forward-looking statements or cautionary, predictive or forward-looking in nature), it being understood that any matter disclosed in the Parent SEC Documents (x) shall not be deemed disclosed for the purposes of Section 3.1, Section 3.2, Section 3.3, Section 3.4, Section 3.5 or Section 3.6 and (y) shall be deemed to be disclosed in a section of the Parent Disclosure Schedule only to the extent that it is readily apparent from a reading of such Parent SEC Document that it is applicable to such section of the Parent Disclosure Schedule, Parent and Merger Sub represent and warrant to the Company as follows:

3.1 **Due Organization; No Subsidiaries**.

(a) Each of Parent and Merger Sub is a corporation duly incorporated, validly existing and in good standing under the Laws of Delaware, and has all necessary corporate power and authority: (i) to conduct

its business in the manner in which its business is currently being conducted; (ii) to own or lease and use its property and assets in the manner in which its property and assets are currently owned or leased and used; and (iii) to perform its obligations under all Contracts by which each is bound. Since the date of its incorporation, Merger Sub has not engaged in any activities other than activities incident to its formation or in connection with or as contemplated by this Agreement.

(b) Parent is duly licensed and qualified to do business, and is in good standing (to the extent applicable in such jurisdiction), under the Laws of all jurisdictions where the nature of its business requires such licensing or qualification other than in jurisdictions where the failure to be so qualified individually or in the aggregate would not be reasonably expected to have a Parent Material Adverse Effect.

(c) Other than Merger Sub, Parent does not have any Subsidiary.

(d) Parent is not and has not otherwise been, directly or indirectly, a party to, member of or participant in any partnership, joint venture or similar business entity. Parent has not agreed and is not obligated to make, and is not bound by any Contract under which it may become obligated to make, any future investment in or capital contribution to any other Entity. Parent has not, at any time, been a general partner of, and has not otherwise been liable for any of the debts or other obligations of, any general partnership, limited partnership or other Entity.

3.2 **Organizational Documents.** Parent has made available to the Company accurate and complete copies of Parent's and Merger Sub's Organizational Documents in effect as of the date of this Agreement. Neither Parent nor Merger Sub is in material breach or violation of its respective Organizational Documents.

3.3 **Authority; Binding Nature of Agreement**.

(a) Each of Parent and Merger Sub has all necessary corporate power and authority to enter into and to perform its obligations under this Agreement and, subject, with respect to Parent, to receipt of the Required Parent Stockholder Vote and, with respect to Merger Sub, the adoption of this Agreement by Parent in its capacity as sole stockholder of Merger Sub, to perform its obligations hereunder and to consummate the Contemplated Transactions. The Parent Board (at meetings duly called and held) has: (i) determined that the Contemplated Transactions are fair to, advisable and in the best interests of Parent and its stockholders; (ii) authorized, approved and declared advisable this Agreement and the Contemplated Transactions, including the issuance of shares of Parent Common Stock to the stockholders of the Company pursuant to the terms of this Agreement and the treatment of the Company Options pursuant to this Agreement; and (iii) determined to recommend, upon the terms and subject to the conditions set forth in this Agreement, that the stockholders of Parent vote to approve the Parent Stockholder Matters. The Merger Sub Board (by unanimous written consent) has: (A) determined that the Contemplated Transactions are fair to, advisable, and in the best interests of Merger Sub and its sole stockholder; (B) authorized, approved and declared advisable this Agreement and the Contemplated Transactions; and (C) determined to recommend, upon the terms and subject to the conditions set forth in this Agreement, that the stockholder of Merger Sub vote to adopt this Agreement and thereby approve the Contemplated Transactions.

(b) This Agreement has been duly executed and delivered by each of Parent and Merger Sub and, assuming the due authorization, execution and delivery by the Company, constitutes the legal, valid and binding obligation of Parent and Merger Sub, enforceable against each of Parent and Merger Sub in accordance with its terms, subject to the Enforceability Exceptions. Prior to the execution of the Parent Stockholder Support Agreements, the Parent Board approved the Parent Stockholder Support Agreements and the transactions contemplated thereby.

3.4 **Vote Required**. (a) The affirmative vote of the holders of a majority of the outstanding shares of Parent Common Stock is the only vote of the holders of any class or series of Parent's capital stock necessary to

approve the proposals in Section 5.3(a)(i) and (ii) and (b) the affirmative vote of a majority of the votes cast at the Parent Stockholders' Meeting is the only vote of the holders of any class or series of Parent's capital stock necessary to approve the proposals in Section 5.3(a)(iii) (the "***Required Parent Stockholder Vote***").

3.5 **Non-Contravention; Consents**. Subject to obtaining the Required Parent Stockholder Vote and the filing of the Certificate of Merger required by the DGCL, neither (x) the execution, delivery or performance of this Agreement by Parent or Merger Sub, nor (y) the consummation of the Contemplated Transactions, will directly or indirectly (with or without notice or lapse of time):

(a) contravene, conflict with or result in a violation of any of the provisions of the Organizational Documents of Parent or Merger Sub;

(b) contravene, conflict with or result in a material violation of, or to the Knowledge of Parent give any Governmental Body or other Person the right to challenge the Contemplated Transactions or to exercise any material remedy or obtain any material relief under, any Law or any order, writ, injunction, judgment or decree to which Parent or Merger Sub, or any of the assets owned or used by Parent or Merger Sub, is subject, except as would not reasonably be expected to be material to Parent or its business;

(c) contravene, conflict with or result in a violation of any of the terms or requirements of, or give any Governmental Body the right to revoke, withdraw, suspend, cancel, terminate or modify, any Governmental Authorization that is held by Parent, except as would not reasonably be expected to be material to Parent or its business;

(d) contravene, conflict with or result in a violation or breach of, or result in a default under, any provision of any Parent Material Contract, or give any Person the right to: (i) declare a default or exercise any remedy under any Parent Material Contract; (ii) any material payment, rebate, chargeback, penalty or change in delivery schedule under any Parent Material Contract; (iii) accelerate the maturity or performance of any Parent Material Contract; or (iv) cancel, terminate or modify any term of any Parent Material Contract, except in the case of any non-material breach, default, penalty or modification; or

(e) result in the imposition or creation of any Encumbrance upon or with respect to any material asset owned or used by Parent (except for Permitted Encumbrances).

Except for (i) any Consent set forth on Section 3.5 of the Parent Disclosure Schedule under any Parent Contract, (ii) the Required Parent Stockholder Vote, (iii) the filing of the Certificate of Merger with the Secretary of State of the State of Delaware pursuant to the DGCL, and (iv) such consents, waivers, approvals, orders, authorizations, registrations, declarations and filings as may be required under applicable federal and state securities Laws, Parent is not and will not be required to make any filing with or give any notice to, or to obtain any Consent from, any Person in connection with (A) the execution, delivery or performance of this Agreement, the Parent Stockholder Support Agreements, and the Parent Lock-up Agreements or (B) the consummation of the Contemplated Transactions, which if individually or in the aggregate were not given or obtained, would reasonably be expected to prevent or materially delay the ability of Parent and Merger Sub to consummate the Contemplated Transactions. The Parent Board and the Merger Sub Board have taken and will take all actions necessary to ensure that the restrictions applicable to business combinations contained in Section 203 of the DGCL are, and will be, inapplicable to the execution, delivery and performance of this Agreement, the Parent Stockholder Support Agreements, the Parent Lock-Up Agreements and to the consummation of the Contemplated Transactions. No other state takeover statute or similar Law applies or purports to apply to the Merger, this Agreement, the Parent Stockholder Support Agreements, the Parent Lock-Up Agreements or any of the other Contemplated Transactions.

3.6 **Capitalization**.

(a) The authorized capital stock of Parent as of the date of this Agreement consists of (i) 60,000,000 shares of Parent Common Stock, par value $0.001 per share, of which 24,051,844 shares have been

issued and are outstanding as of the close of business on the Reference Date and (ii) 5,000,000 shares of preferred stock of Parent, par value $0.001 per share, of which no shares have been issued and are outstanding as of the date of this Agreement. Parent does not hold any shares of its capital stock in its treasury. As of the close of business on the Reference Date, there are outstanding Parent Warrants to purchase 8,609,853 shares of Parent Common Stock.

(b) All of the outstanding shares of Parent Common Stock have been duly authorized and validly issued, and are fully paid and nonassessable. None of the outstanding shares of Parent Common Stock is entitled or subject to any preemptive right, right of participation, right of maintenance or any similar right and none of the outstanding shares of Parent Common Stock is subject to any right of first refusal in favor of Parent. Except as contemplated herein, there is no Parent Contract relating to the voting or registration of, or restricting any Person from purchasing, selling, pledging or otherwise disposing of (or granting any option or similar right with respect to), any shares of Parent Common Stock. Parent is not under any obligation, nor is it bound by any Contract pursuant to which it may become obligated, to repurchase, redeem or otherwise acquire any outstanding shares of Parent Common Stock or other securities. Section 3.6(b) of the Parent Disclosure Schedule accurately and completely lists all repurchase or forfeiture rights held by the Parent with respect to shares of Parent Common Stock (including shares issued pursuant to the exercise of stock options).

(c) Except for the Parent Stock Plans, Parent does not have any stock option plan or any other plan, program, agreement or arrangement providing for any equity-based compensation for any Person. As of the close of business on the Reference Date, 2,318,647 shares have been reserved for issuance upon exercise of Parent Options granted under the Parent Stock Plans that are outstanding as of the date of this Agreement, 155,426 shares have been reserved for issuance pursuant to Parent Deferred Stock Rights granted under the Parent Stock Plans that are outstanding as of the date of this Agreement, and 2,196,036 shares remain available for future issuance pursuant to the Parent Stock Plans. Section 3.6(c) of the Parent Disclosure Schedule sets forth the following information with respect to each Parent Option outstanding as of the date of this Agreement: (i) the name of the holder; (ii) the number of shares of Parent Common Stock subject to such Parent Option at the time of grant; (iii) the number of shares of Parent Common Stock subject to such Parent Option as of the date of this Agreement; (iv) the exercise price of such Parent Option; (v) the date on which such Parent Option was granted; (vi) the applicable vesting schedule, including the number of vested and unvested shares as of the date of this Agreement and any acceleration provisions; (vii) the date on which such Parent Option expires (and whether there has been any extension of such expiration date or any other provisions or agreements that may result in an extension of the expiration date of such Parent Option beyond the date(s) provided in the form of stock option agreement provided to the Company); and (viii) whether such Parent Option is intended to constitute an “incentive stock option” (as defined in the Code) or a non-qualified stock option. Section 3.6(c) of the Parent Disclosure Schedule sets forth the following information with respect to each Parent Deferred Stock Rights outstanding as of the date of this Agreement: (i) the name of the holder; (ii) the number of shares of Parent Common Stock subject to such Parent Deferred Stock Right at the time of grant; (iii) the number of shares of Parent Common Stock subject to such Parent Deferred Stock Right as of the date of this Agreement; (iv) the date on which such Parent Deferred Stock Right was granted; (v) the applicable vesting schedule, if any, including the number of vested and unvested shares as of the date of this Agreement and any acceleration provisions; and (vi) the distribution or settlement provisions applicable to such Parent Deferred Stock Right. Parent has made available to the Company accurate and complete copies of the Parent Stock Plans and all forms of the stock option and other award agreements evidencing outstanding awards granted thereunder.

(d) Except for the Parent Warrants, the Parent Stock Plans, the Parent Options, the Parent Deferred Stock Rights, there is no: (i) outstanding subscription, option, call, warrant or right (whether or not currently exercisable) to acquire any shares of the capital stock or other securities of Parent or any of its Subsidiaries; (ii) outstanding security, instrument or obligation that is or may become convertible into or exchangeable for any shares of the capital stock or other securities of Parent or any of its Subsidiaries; or (iii) condition or circumstance that is reasonably likely to give rise to or provide a basis for the assertion of a claim by any Person to the effect that such Person is entitled to acquire or receive any shares of capital stock or

other securities of Parent or any of its Subsidiaries. There are no outstanding or authorized stock appreciation, phantom stock, profit participation or other similar rights with respect to Parent or any of its Subsidiaries.

(e) All outstanding shares of Parent Common Stock, Parent Options, Parent Deferred Stock Rights, Parent Warrants and other securities of Parent have been issued and granted in material compliance with (i) all applicable securities Laws and other applicable Law, and (ii) all requirements set forth in applicable Contracts.

3.7 **SEC Filings; Financial Statements**.

(a) Parent has delivered or made available to the Company accurate and complete copies of all registration statements, proxy statements, Certifications (as defined below) and other statements, reports, schedules, forms and other documents filed by Parent with the SEC since January 1, 2018 (the "***Parent SEC Documents***"), other than such documents that can be obtained on the SEC's website at www.sec.gov. Since January 1, 2017, all material statements, reports, schedules, forms and other documents required to have been filed by Parent or its officers with the SEC have been so filed on a timely basis. As of the time it was filed with the SEC (or, if amended or superseded by a filing prior to the date of this Agreement, then on the date of such filing), each of the Parent SEC Documents complied in all material respects with the applicable requirements of the Securities Act or the Exchange Act (as the case may be) and, as of the time they were filed, none of the Parent SEC Documents contained any untrue statement of a material fact or omitted to state a material fact required to be stated therein or necessary in order to make the statements therein, in light of the circumstances under which they were made, not misleading. The certifications and statements required by (i) Rule 13a-14 under the Exchange Act and (ii) 18 U.S.C. §1350 (Section 906 of the Sarbanes-Oxley Act) relating to the Parent SEC Documents (collectively, the "***Certifications***") are accurate and complete and comply as to form and content with all applicable Laws. As used in this Section 3.7, the term "file" and variations thereof shall be broadly construed to include any manner in which a document or information is furnished, supplied or otherwise made available to the SEC.

(b) The financial statements (including any related notes) contained or incorporated by reference in the Parent SEC Documents: (i) complied as to form in all material respects with the published rules and regulations of the SEC applicable thereto; (ii) were prepared in accordance with GAAP (except as may be indicated in the notes to such financial statements or, in the case of unaudited financial statements, except as permitted by Form 10-Q of the SEC, and except that the unaudited financial statements may not contain footnotes and are subject to normal and recurring year-end adjustments) applied on a consistent basis unless otherwise noted therein throughout the periods indicated; and (iii) fairly present, in all material respects, the financial position of Parent as of the respective dates thereof and the results of operations and cash flows of Parent for the periods covered thereby. Other than as expressly disclosed in the Parent SEC Documents filed prior to the date hereof, there has been no material change in Parent's accounting methods or principles that would be required to be disclosed in Parent's financial statements in accordance with GAAP. The books of account and other financial records of Parent are true and complete in all material respects.

(c) Parent's independent registered accounting firm has at all times since the date Parent became subject to the applicable provisions of the Sarbanes-Oxley Act been; (i) a registered public accounting firm (as defined in Section 2(a)(12) of the Sarbanes-Oxley Act); (ii) to the Knowledge of Parent "Independent" with respect to Parent within the meaning of Regulation S-X under the Exchange Act; and (iii) to the Knowledge of Parent, in compliance with subsections (g) through (l) of Section 10A of the Exchange Act and the rules and regulations promulgated by the SEC and the Public Company Accounting Oversight Board thereunder.

(d) Since January 1, 2017 through the date of this Agreement, Parent has not received any comment letter from the SEC or the staff thereof or any correspondence from officials of Nasdaq or the staff thereof relating to the delisting or maintenance of listing of the Parent Common Stock on Nasdaq. Parent has not disclosed any unresolved comments in the Parent SEC Documents.

(e) Since January 1, 2017, there have been no formal investigations regarding financial reporting or accounting policies and practices discussed with, reviewed by or initiated at the direction of the chief executive officer, chief financial officer, principal accounting officer or general counsel of Parent, the Parent Board or any committee thereof, other than ordinary course audits or reviews of accounting policies and practices or internal controls required by the Sarbanes-Oxley Act.

(f) Parent is and since January 1, 2017 has been, in compliance in all material respects with the applicable current listing and governance rules and regulations of Nasdaq.

(g) Parent maintains, and at all times since January 1, 2017 has maintained, a system of internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) of the Exchange Act) that is sufficient to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with GAAP and to provide reasonable assurance (i) that Parent maintains records in reasonable detail accurately and fairly reflect the transactions and dispositions of the assets of Parent and Merger Sub; (ii) that transactions are recorded as necessary to permit preparation of financial statements in accordance with GAAP, (iii) that receipts and expenditures are made only in accordance with authorizations of management and the Parent Board and (iv) regarding prevention or timely detection of the unauthorized acquisition, use or disposition of Parent's assets that could have a material effect on Parent's financial statements. Parent has evaluated the effectiveness of Parent's internal control over financial reporting and, to the extent required by applicable Law, presented in any applicable Parent SEC Document that is a report on Form 10-K or Form 10-Q (or any amendment thereto) its conclusions about the effectiveness of the internal control over financial reporting as of the end of the period covered by such report or amendment based on such evaluation. Parent has disclosed, based on its most recent evaluation of internal control over financial reporting, to Parent's auditors and audit committee (and made available to the Company a summary of the significant aspects of such disclosure) (A) all material weaknesses and significant deficiencies, if any, in the design or operation of internal control over financial reporting that are reasonably likely to adversely affect Parent's ability to record, process, summarize and report financial information and (B) any known fraud that involves management or other employees who have a significant role in Parent's internal control over financial reporting. Parent has not identified, based on its most recent evaluation of internal control over financial reporting, any material weaknesses in the design or operation of Parent's internal control over financial reporting.

(h) Parent maintains "disclosure controls and procedures" (as defined in Rules 13a-15(e) and 15d-15(e) of the Exchange Act) that are reasonably designed to ensure that all information required to be disclosed by Parent in the periodic reports that it files or submits under the Exchange Act is recorded, processed, summarized and reported within the time periods required by the SEC, and that all such information is accumulated and communicated to Parent's management as appropriate to allow timely decisions regarding required disclosure and to make the Certifications.

3.8 **Absence of Changes**. Except as set forth on Section 3.8 of the Parent Disclosure Schedule, between the date of the Parent Balance Sheet and the date of this Agreement, Parent and its Subsidiaries have conducted its business only in the Ordinary Course of Business (except for the execution and performance of this Agreement and the discussions, negotiations and transactions related thereto) and there has not been any (a) Parent Material Adverse Effect or (b) action, event or occurrence that would have required consent of the Company pursuant to Section 4.1(b) had such action, event or occurrence taken place after the execution and delivery of this Agreement.

3.9 **Absence of Undisclosed Liabilities.** As of the date hereof, Parent does not have any Liability, individually or in the aggregate, of a type required to be recorded or reflected on a balance sheet or disclosed in the footnotes thereto under GAAP except for: (a) Liabilities disclosed, reflected or reserved against in the Parent Balance Sheet; (b) Liabilities that have been incurred by Parent since the date of the Parent Balance Sheet in the Ordinary Course of Business; (c) Liabilities for performance of obligations of Parent under Parent Contracts; (d) Liabilities incurred in connection with the Contemplated Transactions; (e) Liabilities which would not,

individually or in the aggregate, reasonably be expected to be material to the Parent; and (f) Liabilities described in Section 3.9 of the Parent Disclosure Schedule.

3.10 **Title to Assets**. Parent owns, and has good and valid title to, or, in the case of leased properties and assets, valid leasehold interests in, all tangible properties or tangible assets and equipment used or held for use in its business or operations or purported to be owned by it that are material to Parent or its business, including: (a) all tangible assets reflected on the Parent Balance Sheet; and (b) all other tangible assets reflected in the books and records of Parent as being owned by Parent. All of such assets are owned or, in the case of leased assets, leased by Parent free and clear of any Encumbrances, other than Permitted Encumbrances.

3.11 **Real Property; Leasehold**. Parent does not own any real property. Parent has made available to the Company (a) an accurate and complete list of all real properties with respect to which Parent directly or indirectly holds a valid leasehold interest as well as any other real estate that is in the possession of or leased by Parent, and (b) copies of all leases under which any such real property is possessed (the "***Parent Real Estate Leases***"), each of which is in full force and effect, with no existing material default thereunder. Parent's use and operation of each such leased property conforms to all applicable Laws in all material respects, and Parent has exclusive possession of each such leased property and has not granted any occupancy rights to tenants or licensees with respect to such leased property. In addition, each such leased property is free and clear of all Encumbrances other than Permitted Encumbrances.

3.12 **Intellectual Property**.

(a) Section 3.12(a) of the Parent Disclosure Schedule identifies each item of material Parent IP, including, with respect to each patent and patent application: (i) the name of the applicant/registrant, (ii) the jurisdiction of application/registration, (iii) the application or registration number and (iv) any other co-owners. To the Knowledge of Parent, each of the patents and patent applications included in the Section 3.12(a) of the Parent Disclosure Schedule properly identifies by name each and every inventor of the inventions claimed therein as determined in accordance with applicable Laws of the United States. To the knowledge of Parent, as of the date of this Agreement, no cancellation, interference, opposition, reissue, reexamination or other proceeding of any nature (other than office actions or similar communications issued by any Governmental Body in the ordinary course of prosecution of any pending applications for registration) is pending or threatened in writing, in which the scope, validity, enforceability or ownership of any Parent IP is being or has been contested or challenged.

(b) Except as has not had and would not reasonably be expected to have, individually or in the aggregate, a Parent Material Adverse Effect, Parent owns, is the assignee of, or has licensed all material Parent IP (other than as disclosed on Section 3.12(b) of the Parent Disclosure Schedule), free and clear of all Encumbrances other than Permitted Encumbrances. To the Knowledge of Parent, each Parent Associate involved in the creation or development of any material Parent IP, pursuant to such Parent Associate's activities on behalf of Parent, has signed a written agreement containing an assignment of such Parent Associate's rights in such Parent IP to Parent and confidentiality provisions protecting the Parent IP.

(c) To the Knowledge of Parent, no funding, facilities or personnel of any Governmental Body or any university, college, research institute or other educational institution has been used to create Parent IP, except for any such funding or use of facilities or personnel that does not result in such Governmental Body or institution obtaining ownership rights to such Parent IP or the right to receive royalties for the practice of such Parent IP.

(d) Section 3.12(d) of Parent Disclosure Schedule sets forth each license agreement pursuant to which the Parent (i) is granted a license under any material Intellectual Property Right owned by any third party that is used by Parent in its business as currently conducted (each a "***Parent In-bound License***") or (ii) grants to any third party a license under any material Parent IP or material Intellectual Property Right licensed to the

Parent under a Parent In-bound License (each a "***Parent Out-bound License***") (provided, that, Parent In-bound Licenses shall not include, when entered into in the ordinary course of business, material transfer agreements, services agreements, clinical trial agreements, agreements with Parent Associates, non-disclosure agreements, commercially available Software-as-a-Service offerings, off-the-shelf software licenses or generally available patent license agreements; and Parent Out-bound Licenses shall not include, when entered into in the ordinary course of business, material transfer agreements, clinical trial agreements, services agreements, non-disclosure agreements, or non-exclusive outbound licenses).

(e) To the Knowledge of Parent: (i) the operation of the business of Parent as currently conducted does not infringe, misappropriate or otherwise violate any valid and enforceable United States patent that is not included on Section 2.12(a) of the Company Disclosure Schedule and (ii) no other Person is infringing, misappropriating or otherwise violating any Parent IP. No Legal Proceeding is pending (or, to the Knowledge of Parent, is threatened in writing) (A) against Parent alleging that the operation of the business of Parent infringes or constitutes the misappropriation or other violation of any Intellectual Property Rights of another Person or (B) by Parent alleging that another Person has infringed, misappropriated or otherwise violated any of Parent IP or any Intellectual Property Rights exclusively licensed to Parent. Since January 1, 2017, Parent has not received any written notice or other written communication alleging that the operation of the business of Parent infringes or constitutes the misappropriation or other violation of any Intellectual Property Right of another Person.

(f) None of Parent IP or, to the Knowledge of Parent, any material Intellectual Property Rights exclusively licensed to Parent is subject to any pending or outstanding injunction, directive, order, judgment or other disposition of dispute that adversely and materially restricts the use, transfer, registration or licensing by Parent of any such Parent IP or material Intellectual Property Rights exclusively licensed to Parent or its Subsidiaries.

(g) To the Knowledge of Parent, the operation of Parent's business are in substantial compliance with all Laws pertaining to data privacy and data security of Sensitive Data, except to the extent that such noncompliance has not and would not reasonably be expected to have a Parent Material Adverse Effect. To the Knowledge of Parent, since January 1, 2017, there have been (i) no material losses or thefts of data or security breaches relating to Sensitive Data used in the business of Parent, (ii) no violations of any security policy of Parent regarding any such Sensitive Data used in the business of Parent, (iii) no unauthorized access, unauthorized use or unintended or improper disclosure of any Sensitive Data used in the business of Parent, in each case of (i) through (iii), except as would not reasonably be expected to, individually or in the aggregate, have a Parent Material Adverse Effect.

3.13 **Agreements, Contracts and Commitments.** Section 3.13 of the Parent Disclosure Schedule lists the following Parent Contracts in effect as of the date of this Agreement (and, except with respect to clauses (m) and (n) below, other than any Benefit Plans) (each, a "***Parent Material Contract***" and collectively, the "***Parent Material Contracts***"):

(a) a material contract as defined in Item 601(b)(10) of Regulation S-K as promulgated under the Securities Act;

(b) each Contract relating to any agreement of indemnification or guaranty not entered into in the Ordinary Course of Business;

(c) each Contract containing (A) any covenant limiting the freedom of Parent to engage in any line of business or compete with any Person, (B) any most-favored pricing arrangement, (C) any exclusivity provision, or (D) any non-solicitation provision with respect to employees of other Persons, in each case, except for restrictions that would not materially affect the ability of Parent to conduct its business;

(d) each Contract relating to capital expenditures and requiring payments after the date of this Agreement in excess of $250,000 pursuant to its express terms and not cancelable without penalty;

(e) each Contract relating to the disposition or acquisition of material assets or any ownership interest in any Entity, in each case, involving payments in excess of $250,000, other than Parent Contracts in which the applicable acquisition or disposition has been consummated and there are no material ongoing obligations;

(f) each Contract relating to any mortgages, indentures, loans, notes or credit agreements, security agreements or other agreements or instruments relating to the borrowing of money or extension of credit or creating any material Encumbrances with respect to any assets of Parent or any loans or debt obligations with officers or directors of Parent, in each case, having an outstanding principal in an amount in excess of $250,000;

(g) each Contract requiring payment by or to Parent after the date of this Agreement in excess of $250,000 pursuant to its express terms relating to: (A) any distribution agreement (identifying any that contain exclusivity provisions); (B) any agreement involving provision of services or products with respect to any pre-clinical or clinical development activities of Parent; (C) any dealer, distributor, joint marketing, alliance, joint venture, cooperation, development or other agreement currently in force under which Parent has continuing obligations to develop or market any product, technology or service, or any agreement pursuant to which Parent has continuing obligations to develop any Intellectual Property Rights that will not be owned, in whole or in part, by Parent; or (D) any Contract to license any third party to manufacture or produce any product, service or technology of Parent or any Contract to sell, distribute or commercialize any products or service of Parent, in each case, except for Contracts entered into in the Ordinary Course of Business;

(h) each Contract with any financial advisor, broker, finder, investment banker or other similar Person, providing advisory services to Parent in connection with the Contemplated Transactions;

(i) each Parent Real Estate Lease;

(j) each Contract with any Governmental Body (other than clinical trial agreements for clinical trial studies);

(k) each Parent Out-bound License and Parent In-bound License;

(l) each Contract containing any royalty, dividend or similar arrangement based on the revenues or profits of Parent;

(m) each Parent Contract, offer letter, employment agreement, or independent contractor agreement with any employee, consultant or independent contractor that (A) is not terminable by Parent without less than 60 days notice, severance, or other cost or liability, or (B) provides for retention payments, change of control payments, severance, accelerated vesting, or any payment or benefit that may or will become due as a result of the Merger (whether alone or in connection with any other event); or

(n) any other Contract that is not terminable at will (with no penalty or payment) by Parent and (A) which involves payment or receipt by Parent after the date of this Agreement under any such agreement, contract or commitment of more than $250,000 in the aggregate, or obligations after the date of this Agreement in excess of $250,000 in the aggregate, or (B) that is material to the business or operations of Parent.

Parent has delivered or made available to the Company accurate and complete copies of all Parent Material Contracts, including all amendments thereto. There are no Parent Material Contracts that are not in written form. Parent has not nor, to Parent's Knowledge, as of the date of this Agreement, has any other party to a Parent Material Contract, breached, violated or defaulted under, or received notice that it breached, violated or defaulted under, any of the terms or conditions of any Parent Material Contract in such manner as would permit any other party to cancel or terminate any such Parent Material Contract, or would permit any other party to seek damages which would reasonably be expected to be material to Parent or its business. As to Parent, as of the date of this

Agreement, each Parent Material Contract is valid, binding, enforceable and in full force and effect, subject to the Enforceability Exceptions. No Person is renegotiating, or has a right pursuant to the terms of any Parent Material Contract to change, any material amount paid or payable to Parent under any Parent Material Contract or any other material term or provision of any Parent Material Contract.

3.14 **Compliance; Permits**.

(a) Parent is, and since January 1, 2016 has been, in compliance in all material respects with all applicable Laws, including the FDCA, the FDA regulations adopted thereunder, the Public Health Service Act and any other similar Law administered or promulgated by the FDA or other Drug Regulatory Agency, except for any noncompliance, either individually or in the aggregate, which would not be material to Parent. No investigation, claim, suit, proceeding, audit or other action by any Governmental Body is pending or, to the Knowledge of Parent, threatened against Parent. There is no agreement, judgment, injunction, order or decree binding upon Parent which (i) has or would reasonably be expected to have the effect of prohibiting or materially impairing any business practice of Parent, any acquisition of material property by Parent or the conduct of business by Parent as currently conducted, (ii) is reasonably likely to have an adverse effect on Parent's ability to comply with or perform any covenant or obligation under this Agreement, or (iii) is reasonably likely to have the effect of preventing, delaying, making illegal or otherwise interfering with the Contemplated Transactions.

(b) Parent holds all required Governmental Authorizations which are material to the operation of the business of Parent as currently conducted (the "***Parent Permits***"). Section 3.14(b) of the Parent Disclosure Schedule identifies each Parent Permit. Parent is in material compliance with the terms of the Parent Permits. No Legal Proceeding is pending or, to the Knowledge of Parent, threatened, which seeks to revoke, limit, suspend, or materially modify any Parent Permit.

(c) There are no proceedings pending or, to the Knowledge of Parent, threatened against Parent with respect to an alleged material violation by Parent of the FDCA, FDA regulations adopted thereunder, the Public Health Service Act or any other similar Law administered or promulgated by any Drug Regulatory Agency.

(d) All clinical, pre-clinical and other studies and tests conducted by or on behalf of, or sponsored by, Parent, or in which Parent or its respective current products or product candidates have participated, were and, if still pending, are being conducted in all material respects in accordance with standard medical and scientific research procedures and in compliance in all material respects with the applicable regulations of any applicable Drug Regulatory Agency and other applicable Law, as applicable, including 21 C.F.R. Parts 50, 54, 56, 58 and 312. No preclinical or clinical trial conducted by or on behalf of Parent has been terminated or suspended prior to completion for safety or non-compliance reasons. Since January 1, 2016, Parent has not received any notices, correspondence, or other communications from any Drug Regulatory Agency requiring, or to the Knowledge of Parent threatening to initiate, the termination or suspension of any clinical studies conducted by or on behalf of, or sponsored by, Parent or in which Parent or its current products or product candidates have participated.

(e) Parent is not the subject of any pending or, to the Knowledge of Parent, threatened investigation in respect of its business or products by the FDA pursuant to its "Fraud, Untrue Statements of Material Facts, Bribery, and Illegal Gratuities" Final Policy set forth in 56 Fed. Reg. 46191 (September 10, 1991) and any amendments thereto. To the Knowledge of Parent, Parent has not committed any acts, made any statement, or has not failed to make any statement, in each case in respect of its business or products that would violate the FDA's "Fraud, Untrue Statements of Material Facts, Bribery, and Illegal Gratuities" Final Policy, and any amendments thereto. Parent or any of its officers, employees or, to the Knowledge of Parent, agents has not been convicted of any crime or engaged in any conduct that could result in a debarment or exclusion (i) under 21 U.S.C. Section 335a or (ii) any similar applicable Law. No debarment or exclusionary claims, actions, proceedings or investigations in respect of their business or products are pending or, to the Knowledge of Parent, threatened against Parent or any of its officers, employees or, to the Knowledge of Parent, agents.

(f) Parent is not a Covered Entity governed by HIPPA, but each of its health plans, if required, has complied with all Laws relating to HIPAA, including the standards for the privacy of Individually Identifiable Health Information at 45 C.F.R. Parts 160 and 164, Subparts A and E, the standards for the protection of Electronic Protected Health Information set forth at 45 C.F.R. Part 160 and 45 C.F.R. Part 164, Subpart A and Subpart C, the standards for transactions and code sets used in electronic transactions at 45 C.F.R. Part 160, Subpart A and Part 162, and the standards for Breach Notification for Unsecured Protected Health Information at 45 C.F.R. Part 164, Subpart D, all as amended from time to time. Each of Parent's health plans has entered into, where required, and are in compliance in all material respects with the terms of all Business Associate Agreements to which Parent has signed as plan sponsor where the plan is a party or otherwise bound. Each of Parent's health plans, where required, has created and maintained written policies and procedures to protect the privacy of all protected health information, provide training to all employees and agents as required under HIPAA, and have implemented security procedures, including physical, technical and administrative safeguards, to protect all personal information and Protected Health Information stored or transmitted in electronic form. Parent has not received written notice from the Office for Civil Rights for the U.S. Department of Health and Human Services or any other Governmental Body of any allegation regarding its failure to comply with HIPAA or any other state law or regulation applicable to the protection of individually identifiable health information or personally identifiable information. No successful Security Incident, Breach of Unsecured Protected Health Information or breach of personally identifiable information under applicable state or federal laws have occurred with respect to information maintained or transmitted to any health plan of Parent or an agent or third party subject to a Business Associate Agreement with any health plan of Parent. If required, each health plan of Parent is currently submitting, receiving and handling or is capable of submitting receiving and handling transactions in accordance with the Standard Transaction Rule. Parent has materially complied with its requirements related to protection of Protected Health Information under its clinical trial agreements with health care provider Covered Entities that have participated in Parent's clinical studies under such agreements. All capitalized terms in this Section 3.14(f) not otherwise defined in this Agreement shall have the meanings set forth under HIPAA.

3.15 **Legal Proceedings; Orders**.

(a) As of the date of this Agreement, there is no material pending Legal Proceeding and, to the Knowledge of Parent, no Person has threatened in writing to commence any Legal Proceeding: (i) that involves (A) Parent, (B) any Parent Associate (in his or her capacity as such) or (C) any of the material assets owned or used by Parent; or (ii) that challenges, or that would have the effect of preventing, delaying, making illegal or otherwise interfering with, the Contemplated Transactions.

(b) Since January 1, 2016 through the date of this Agreement, no Legal Proceeding has been pending against Parent that resulted in material liability to Parent.

(c) There is no order, writ, injunction, judgment or decree to which Parent, or any of the material assets owned or used by Parent, is subject. To the Knowledge of Parent, no officer of Parent is subject to any order, writ, injunction, judgment or decree that prohibits such officer or employee from engaging in or continuing any conduct, activity or practice relating to the business of Parent or to any material assets owned or used by Parent.

3.16 **Tax Matters**.

(a) Parent and Merger Sub have timely filed all income Tax Returns and other material Tax Returns that they were required to file under applicable Law. All such Tax Returns are correct and complete in all material respects and have been prepared in compliance with all applicable Law. No claim has ever been made by any Governmental Body in any jurisdiction where Parent or Merger Sub does not file a particular Tax Return or pay a particular Tax that Parent or Merger Sub is subject to taxation by that jurisdiction.

(b) All income and other material Taxes due and owing by Parent or Merger Sub on or before the date hereof (whether or not shown on any Tax Return) have been fully paid. The unpaid Taxes of Parent and Merger Sub did not, as of the date of the Parent Balance Sheet, materially exceed the reserve for Tax liability (excluding any reserve for deferred Taxes established to reflect timing differences between book and Tax items) set forth on the face of the Parent Balance Sheet. Since the Parent Balance Sheet Date, neither Parent nor Merger Sub has incurred any material Liability for Taxes outside the Ordinary Course of Business.

(c) All Taxes that Parent or Merger Sub are or were required by Law to withhold or collect have been duly and timely withheld or collected in all material respects on behalf of its respective employees, independent contractors, stockholders, lenders, customers or other third parties and, have been timely paid to the proper Governmental Body or other Person or properly set aside in accounts for this purpose.

(d) There are no Encumbrances for material Taxes (other than Permitted Encumbrances) upon any of the assets of Parent or Merger Sub.

(e) No deficiencies for income or other material Taxes with respect to Parent or Merger Sub have been claimed, proposed or assessed by any Governmental Body in writing. There are no pending or ongoing, and to the Knowledge of Parent, threatened audits, assessments or other actions for or relating to any liability in respect of a material amount of Taxes of Parent or Merger Sub. Neither Parent nor Merger Sub (or any of their predecessors) has waived any statute of limitations in respect of any income or other material Taxes or agreed to any extension of time with respect to any income or other material Tax assessment or deficiency.

(f) Parent has not been a United States real property holding corporation within the meaning of Section 897(c)(2) of the Code during the applicable period specified in Section 897(c)(1)(A)(ii) of the Code.

(g) Neither Parent nor Merger Sub is a party to any Tax allocation agreement, Tax sharing agreement, Tax indemnity agreement, or similar agreement or arrangement, other than customary commercial contracts entered into in the Ordinary Course of Business the principal subject matter of which is not Taxes.

(h) Neither Parent nor Merger Sub will be required to include any material item of income in, or exclude any material item of deduction from, taxable income for any Tax period (or portion thereof) ending after the Closing Date as a result of any: (i) change in method of accounting for Tax purposes filed on or prior to the Closing Date; (ii) use of an improper method of accounting for a Tax period ending on or prior to the Closing Date; (iii) “closing agreement” as described in Section 7121 of the Code (or any similar provision of state, local or foreign Law) executed on or prior to the Closing Date; (iv) intercompany transaction or excess loss account described in Treasury Regulations under Section 1502 of the Code (or any similar provision of state, local or foreign Law) entered into on or prior to the Closing Date; (v) installment sale or open transaction disposition made on or prior to the Closing Date; (vi) prepaid amount received on or prior to the Closing Date; or (vii) election under Section 108(i) of the Code (or any similar provision of state, local or foreign Law) made on or prior to the Closing Date. Parent has not made any election under Section 965(h) of the Code.

(i) Neither Parent nor Merger Sub has ever been (i) a member of a consolidated, combined or unitary Tax group (other than such a group the common parent of which is Parent) or (ii) a party to any joint venture, partnership, or other arrangement that is treated as a partnership for U.S. federal income Tax purposes. Neither Parent nor Merger Sub has any Liability for any material Taxes of any Person (other than Parent and Merger Sub) under Treasury Regulations Section 1.1502-6 (or any similar provision of state, local, or foreign Law), or as a transferee or successor.

(j) Neither Parent nor Merger Sub has, since January 1, 2017, distributed stock of another Person, or had its stock distributed by another Person, in a transaction that was purported or intended to be governed in whole or in part by Section 355 of the Code or Section 361 of the Code (or any similar provisions of state, local or foreign Law).

(k) Neither Parent nor Merger Sub (i) is a "controlled foreign corporation" as defined in Section 957 of the Code; (ii) is a "passive foreign investment company" within the meaning of Section 1297 of the Code; (iii) has ever had a permanent establishment (within the meaning of an applicable Tax treaty) or otherwise had an office or fixed place of business in a country other than the country in which it is organized; (iv) is or was a "surrogate foreign corporation" within the meaning of Section 7874(a)(2)(B) or is treated as a U.S. corporation under Section 7874(b) of the Code; or (v) was created or organized in the U.S. such that such entity would be taxable in the U.S. as a domestic entity pursuant to the dual charter provision of Treasury Regulations Section 301.7701-5(a).

(l) Neither Parent nor Merger Sub has participated in or been a party to a transaction that, as of the date of this Agreement, constitutes a "listed transaction" that is required to be reported to the IRS pursuant to Section 6011 of the Code and applicable Treasury Regulations thereunder.

(m) Neither Parent nor Merger Sub has taken or agreed to take any action or knows of any fact that would reasonably be expected to prevent the Merger from qualifying for the Intended Tax Treatment.

For purposes of this Section 3.16, each reference to Parent or Merger Sub shall be deemed to include any Person that was liquidated into, merged with, or is otherwise a predecessor to, Parent or Merger Sub, respectively.

3.17 **Employee and Labor Matters; Benefit Plans**.

(a) Section 3.17(a) of the Parent Disclosure Schedule is a list of all Parent Benefit Plans, including, without limitation, each Parent Benefit Plan that provides for retirement, change in control, stay or retention deferred compensation, incentive compensation, severance or retiree medical or life insurance benefits. "***Parent Benefit Plan***" means each (i) "employee benefit plan" as defined in Section 3(3) of ERISA and (ii) other pension, retirement, deferred compensation, excess benefit, profit sharing, bonus, incentive, equity or equity-based (other than individual Parent Options made pursuant to the Parent's standard forms, in which case only representative standard forms of such stock option agreements shall be scheduled), phantom equity, employment, offer letter, consulting, severance, change-of-control, retention, health, life, disability, group insurance, paid-time off, holiday, welfare and fringe benefit plan, program, contract, or arrangement (whether written or unwritten, qualified or nonqualified, funded or unfunded and including any that have been frozen), in any case, maintained, contributed to, or required to be contributed to, by Parent or Parent ERISA Affiliates for the benefit of any current or former employee, director, officer or independent contractor of Parent or under which Parent has any actual or contingent liability (including, without limitation, as to the result of it being treated as a single employer under Code Section 414 with any other person).

(b) As applicable with respect to each Parent Benefit Plan, Parent has made available to the Company, true and complete copies of (i) each Parent Benefit Plan, including all amendments thereto, and in the case of an unwritten Parent Benefit Plan, a written description thereof, (ii) all current trust documents, investment management contracts, custodial agreements, administrative services agreements and insurance and annuity contracts relating thereto, (iii) the current summary plan description and each summary of material modifications thereto, (iv) the most recently filed annual reports with any Governmental Body (*e.g.*, Form 5500 and all schedules thereto), (v) the most recent IRS determination, opinion or advisory letter, (vi) the most recent summary annual reports, nondiscrimination testing reports, actuarial reports, financial statements and trustee reports, (vii) all records, notices and filings concerning IRS or Department of Labor or other Governmental Body audits or investigations, "prohibited transactions" within the meaning of Section 406 of ERISA or Section 4975 of the Code and (viii) all policies and procedures established to comply with the privacy and security rules of HIPAA.

(c) Each Parent Benefit Plan has been maintained, operated and administered in compliance in all material respects with its terms and any related documents or agreements and the applicable provisions of ERISA, the Code and all other Laws.

(d) The Parent Benefit Plans which are "employee pension benefit plans" within the meaning of Section 3(2) of ERISA and which are intended to meet the qualification requirements of Section 401(a) of the Code have received determination or opinion letters from the IRS on which they may currently rely to the effect that such plans are qualified under Section 401(a) of the Code and the related trusts are exempt from federal income Taxes under Section 501(a) of the Code, respectively, and to the Knowledge of Parent nothing has occurred that would reasonably be expected to materially adversely affect the qualification of such Parent Benefit Plan or the tax exempt status of the related trust.

(e) Neither Parent nor any Parent ERISA Affiliate maintains, contributes to, is required to contribute to, or has any actual or contingent liability with respect to, (i) any "employee pension benefit plan" (within the meaning of Section 3(2) of ERISA) that is subject to Title IV or Section 302 of ERISA or Section 412 of the Code, (ii) any "multiemployer plan" (within the meaning of Section 3(37) of ERISA), (iii) any "multiple employer plan" (within the meaning of Section 413 of the Code) or (iv) any "multiple employer welfare arrangement" (within the meaning of Section 3(40) of ERISA).

(f) There are no pending audits or investigations by any Governmental Body involving any Parent Benefit Plan, and no pending or, to the Knowledge of Parent, threatened claims (except for individual claims for benefits payable in the normal operation of the Parent Benefit Plans), suits or proceedings involving any Parent Benefit Plan, any fiduciary thereof or service provider thereto, in any case, except as would not be reasonably expected to result in material liability to Parent. All contributions and premium payments required to have been made under any of the Parent Benefit Plans or by applicable Law (without regard to any waivers granted under Section 412 of the Code), have been timely made in all material respects and neither Parent nor any Parent ERISA Affiliate has any material liability for any unpaid contributions with respect to any Parent Benefit Plan.

(g) Neither Parent or any Parent ERISA Affiliates, nor to the Knowledge of Parent, any fiduciary, trustee or administrator of any Parent Benefit Plan, has engaged in, or in connection with the transactions contemplated by this Agreement will engage in, any transaction with respect to any Parent Benefit Plan which would subject any such Parent Benefit Plan, Parent or Parent ERISA Affiliates to a material Tax, material penalty or material liability for a "prohibited transaction" under Section 406 of ERISA or Section 4975 of the Code.

(h) No Parent Benefit Plan provides death, medical, dental, vision, life insurance or other welfare benefits beyond termination of service or retirement other than coverage mandated by Law and neither Parent nor any Parent ERISA Affiliates has made a written or oral representation promising the same.

(i) Neither the execution of, nor the performance of the transactions contemplated by, this Agreement will either alone or in connection with any other event(s) (i) result in any payment becoming due to any current or former employee, director, officer, or independent contractor of Parent, (ii) increase any amount of compensation or benefits otherwise payable under any Parent Benefit Plan, (iii) result in the acceleration of the time of payment, funding or vesting of any benefits under any Parent Benefit Plan, (iv) require any contribution or payment to fund any obligation under any Parent Benefit Plan or (v) limit the right to merge, amend or terminate any Parent Benefit Plan.

(j) Neither the execution of, nor the consummation of the transactions contemplated by this Agreement (either alone or when combined with the occurrence of any other event, including without limitation, a termination of employment) will result in the receipt or retention by any person who is a "disqualified individual" (within the meaning of Code Section 280G) with respect to Parent of any payment or benefit that is or could be characterized as a "parachute payment" (within the meaning of Code Section 280G), determined without regard to the application of Code Section 280G(b)(5).

(k) The exercise price of each Parent Option is not, never has been, less than the fair market value of one share of Parent Common Stock as of the grant date of such Parent Option.

(l) Each Parent Benefit Plan providing for deferred compensation that constitutes a "nonqualified deferred compensation plan" (as defined in Section 409A(d)(1) of the Code and the regulations promulgated thereunder) is, and has been, established, administered and maintained in compliance with the requirements of Section 409A of the Code and the regulations promulgated thereunder in all material respects.

(m) No current or former employee, officer, director or independent contractor of Parent has any "gross up" agreements with the Parent or other assurance of reimbursement by the Parent for any Taxes imposed under Code Section 409A or Code Section 4999.

(n) Parent has provided to the Company a true and correct list, as of the date of this Agreement, containing the names of all full-time, part-time or temporary employees and independent contractors (and indication as such), and, as applicable: (i) the annual dollar amount of all compensation (including wages, salary or fees, commissions, director's fees, fringe benefits, bonuses, profit sharing payments, and other payments or benefits of any type) payable to each person; (ii), dates of employment or service; (iii) title; (iv) any eligibility to receive severance, notice of termination, retention payment, change of control payment, or other similar compensation; (v) visa status, if applicable; and (vi) with respect to employees, a designation of whether they are classified as exempt or non-exempt for purposes of FLSA and any similar state law.

(o) Parent is not and never has been a party to, bound by, or has a duty to bargain under, any collective bargaining agreement or other Contract with a labor union, labor organization, or similar Person representing any of its employees, and there is no labor union, labor organization, or similar Person representing or, to the Knowledge of Parent, purporting to represent or seeking to represent any employees of Parent, including through the filing of a petition for representation election. There is not and has not been in the past three years, nor is there or has there been in the past three years any threat of, any strike, slowdown, work stoppage, lockout, union election petition, demand for recognition, or any similar activity or dispute, or, to the Knowledge of Parent, any union organizing activity, against Parent or any of its Subsidiaries. No event has occurred, and no condition or circumstance exists, that might directly or indirectly be likely to give rise to or provide a basis for the commencement of any such strike, slowdown, work stoppage, lockout, union election petition, demand for recognition, any similar activity or dispute, or, to the Knowledge of Parent, any union organizing activity.

(p) Parent is, and since January 1, 2016 has been, in material compliance with all applicable Laws respecting labor, employment, employment practices, and terms and conditions of employment, including worker classification, discrimination, harassment and retaliation, equal employment opportunities, fair employment practices, meal and rest periods, immigration, employee safety and health, payment of wages (including overtime wages), unemployment and workers' compensation, leaves of absence, and hours of work. Except as would not be reasonably likely to result in a material liability to Parent, with respect to employees of Parent, Parent, since January 1, 2016: (i) has withheld and reported all amounts required by Law or by agreement to be withheld and reported with respect to wages, salaries and other payments, benefits, or compensation to employees, (ii) is not liable for any arrears of wages (including overtime wages), severance pay or any Taxes or any penalty for failure to comply with any of the foregoing, and (iii) is not liable for any payment to any trust or other fund governed by or maintained by or on behalf of any Governmental Body, with respect to unemployment compensation benefits, disability, social security or other benefits or obligations for employees (other than routine payments to be made in the Ordinary Course of Business). There are no actions, suits, claims, charges, lawsuits, investigations, audits or administrative matters pending or, to the Knowledge of Parent, threatened or reasonably anticipated against Parent relating to any employee, applicant for employment, consultant, employment agreement or Parent Benefit Plan (other than routine claims for benefits).

(q) Except as would not be reasonably likely to result in a material liability to Parent, with respect to each individual who currently renders services to Parent, Parent has accurately classified each such individual as an employee, independent contractor, or otherwise under all applicable Laws and, for each individual classified as an employee, Parent has accurately classified him or her as exempt or non-exempt under

all applicable Laws. Parent has no material liability with respect to any misclassification of: (i) any Person as an independent contractor rather than as an employee, (ii) any employee leased from another employer, or (iii) any employee currently or formerly classified as exempt under all applicable Laws.

(r) Within the preceding five (years, Parent has not implemented any "plant closing" or "mass layoff" of employees that would reasonably be expected to require notification under the WARN Act or any similar state or local Law, no such "plant closing" or "mass layoff" will be implemented before the Closing Date without advance notification to and approval of Parent, and there has been no "employment loss" as defined by the WARN Act within the 90 days prior to the Closing Date.

(s) There is no Legal Proceeding, claim, unfair labor practice charge or complaint, labor dispute or grievance pending or, to the Knowledge of Parent, threatened against Parent relating to labor, employment, employment practices, or terms and conditions of employment.

(t) No Parent Benefit Plan is maintained outside the United States.

(u) Since September 30, 2018 through the date of this Agreement, no employee of Parent has terminated his or her employment for any reason.

3.18 **Environmental Matters.** Parent is and since January 1, 2013 has complied with all applicable Environmental Laws, which compliance includes the possession by Parent of all permits and other Governmental Authorizations required under applicable Environmental Laws and compliance with the terms and conditions thereof, except for any failure to be in such compliance that, either individually or in the aggregate, would not reasonably be expected to be material to Parent or its business. Parent has not received since January 1, 2013 (or prior to that time, which is pending and unresolved), any written notice or other communication (in writing or otherwise), whether from a Governmental Body or other Person, that alleges that Parent is not in compliance with or has liability pursuant to any Environmental Law and, to the Knowledge of Parent, there are no circumstances that would reasonably be expected to prevent or interfere with Parent's compliance in any material respects with any Environmental Law, except where such failure to comply would not reasonably be expected to be material to Parent or its business. No current or (during the time a prior property was leased or controlled by Parent) prior property leased or controlled by Parent has had a release of or exposure to Hazardous Materials in material violation of or as would reasonably be expected to result in any material liability of Parent pursuant to Environmental Law. No consent, approval or Governmental Authorization of or registration or filing with any Governmental Body is required by Environmental Laws in connection with the execution and delivery of this Agreement or the consummation of Contemplated Transactions. Prior to the date hereof, Parent has provided or otherwise made available to the Company true and correct copies of all material environmental reports, assessments, studies and audits in the possession or control of Parent with respect to any property leased or controlled by Parent or any business operated by it.

3.19 **Transactions with Affiliates**. Except as set forth in the Parent SEC Documents filed prior to the date of this Agreement, since the date of Parent's last proxy statement filed in 2017 with the SEC, no event has occurred that would be required to be reported by Parent pursuant to Item 404 of Regulation S-K. Section 3.19 of the Parent Disclosure Schedule identifies each Person who is (or who may be deemed to be) an Affiliate of Parent as of the date of this Agreement.

3.20 **Insurance**. Parent has delivered or made available to the Company accurate and complete copies of all material insurance policies and all material self-insurance programs and arrangements relating to the business, assets, liabilities and operations of Parent. Each of such insurance policies is in full force and effect and Parent is in compliance in all material respects with the terms thereof. Other than customary end of policy notifications from insurance carriers, since January 1, 2016, Parent has not received any notice or other communication regarding any actual or possible: (a) cancellation or invalidation of any insurance policy; or (b) refusal or denial of any coverage, reservation of rights or rejection of any material claim under any insurance

policy. Parent has provided timely written notice to the appropriate insurance carrier(s) of each Legal Proceeding that is currently pending against Parent for which Parent has insurance coverage, and no such carrier has issued a denial of coverage or a reservation of rights with respect to any such Legal Proceeding, or informed Parent of its intent to do so.

3.21 **No Financial Advisors**. Except as set forth on Section 3.21 of the Parent Disclosure Schedule, no broker, finder or investment banker is entitled to any brokerage fee, finder's fee, opinion fee, success fee, transaction fee or other fee or commission in connection with the Contemplated Transactions based upon arrangements made by or on behalf of Parent.

3.22 **Anti-Bribery**. Neither Parent nor any of its directors, officers, employees or, to Parent's Knowledge, agents or any other Person acting on its behalf has directly or indirectly made any bribes, rebates, payoffs, influence payments, kickbacks, illegal payments, illegal political contributions, or other payments, in the form of cash, gifts, or otherwise, or taken any other action, in violation of Anti-Bribery Laws. Parent is not or has not been the subject of any investigation or inquiry by any Governmental Body with respect to potential violations of Anti-Bribery Laws.

3.23 **Valid Issuance**. The Parent Common Stock to be issued in the Merger will, when issued in accordance with the provisions of this Agreement, be validly issued, fully paid and nonassessable.

3.24 **Opinion of Financial Advisor**. The Parent Board has received an opinion of Aquilo Partners, L.P. to the effect that, as of the date of this Agreement and subject to the assumptions, qualifications, limitations and other matters set forth therein that the Consideration is fair, from a financial point of view, to the holders of Parent Common Stock. It is agreed and understood that such opinion is for the benefit of the Parent Board and may not be relied upon by the Company.

3.25 **Disclaimer of Other Representations or Warranties**.

(a) Except as previously set forth in this Section 3 or in any certificate delivered by Parent or Merger Sub to the Company pursuant to this Agreement, neither Parent nor Merger Sub makes any representation or warranty, express or implied, at law or in equity, with respect to it or any of its assets, liabilities or operations, and any such other representations or warranties are hereby expressly disclaimed.

(b) Each of Parent and Merger Sub acknowledges and agrees that, except for the representations and warranties of the Company set forth in Section 2, none of the Company or any of their respective Representatives is relying on any other representation or warranty of the Company or any other Person made outside of Section 2, including regarding the accuracy or completeness of any such other representations or warranties or the omission of any material information, whether express or implied, in each case, with respect to the Contemplated Transactions.

Section 4. CERTAIN COVENANTS OF THE PARTIES

4.1 **Operation of Parent's Business**.

(a) Except as set forth on Section 4.1(a) of the Parent Disclosure Schedule, as expressly permitted by this Agreement, as required by applicable Law or unless the Company shall otherwise consent in writing (which consent shall not be unreasonably withheld, delayed or conditioned), during the period commencing on the date of this Agreement and continuing until the earlier to occur of the termination of this Agreement pursuant to Section 9 and the Effective Time (the "***Pre-Closing Period***"): each of Parent and Merger Sub shall conduct its business and operations in the Ordinary Course of Business and in compliance in all material respects with all applicable Laws and the requirements of all Contracts that constitute Parent Material Contracts.

(b) Except (i) as expressly permitted by this Agreement, (ii) as set forth in Section 4.1(b) of the Parent Disclosure Schedule, (iii) as required by applicable Law or (iv) with the prior written consent of the Company (which consent shall not be unreasonably withheld, delayed or conditioned), at all times during the Pre-Closing Period, Parent shall not, nor shall its cause or permit Merger Sub to, do any of the following:

(i) declare, accrue, set aside or pay any dividend or make any other distribution in respect of any shares of its capital stock or repurchase, redeem or otherwise reacquire any shares of its capital stock or other securities (except in connection with the payment of withholding Taxes incurred upon the exercise, settlement or vesting of any award granted under the Parent Stock Plans in accordance with the terms of such award in effect on the date of this Agreement);

(ii) sell, issue, grant, pledge or otherwise dispose of or encumber or authorize any of the foregoing with respect to: (A) any capital stock or other security of Parent (except for Parent Common Stock issued upon the valid exercise of outstanding Parent Options or Parent Warrants); (B) any option, warrant or right to acquire any capital stock or any other security; or (C) any instrument convertible into or exchangeable for any capital stock or other security of Parent;

(iii) except as required to give effect to anything in contemplation of the Closing, amend any of its Organizational Documents, or effect or be a party to any merger, consolidation, share exchange, business combination, recapitalization, reclassification of shares, stock split, reverse stock split or similar transaction except, for the avoidance of doubt, the Contemplated Transactions;

(iv) form any Subsidiary or acquire any equity interest or other interest in any other Entity or enter into a joint venture with any other Entity;

(v) (A) lend money to any Person, (B) incur or guarantee any indebtedness for borrowed money, (C) guarantee any debt securities of others, or (D) make any capital expenditure or commitment in excess of the budgeted capital expenditure and commitment amounts set forth in the Parent operating budget delivered to the Company concurrently with the execution of this Agreement (the "***Parent Budget***");

(vi) other than as required by applicable Law or the terms of any Parent Benefit Plan as in effect on the date of this Agreement: (A) adopt, terminate, establish or enter into any Parent Benefit Plan; (B) cause or permit any Parent Benefit Plan to be amended in any material respect (other than approval of the 2019 Plan pursuant to Section 5.20); (C) pay any bonus or make any profit-sharing or similar payment to, or increase the amount of the wages, salary, commissions, benefits or other compensation or remuneration payable to, any of its directors, officers or employees; (D) increase the severance, retention or change of control benefits offered to any current or former or new employees, directors or consultants; (E) hire or retain any officer, employee or consultant; or (F) terminate or give notice of termination to any officer or employee, other than any termination for cause;

(vii) recognize any labor union, labor organization, or similar Person except as otherwise required by law and after advance notice to the Company;

(viii) enter into any transaction other than in the Ordinary Course of Business;

(ix) enter into any transaction with respect to the SARD Compound or the SARM Compound (each, as defined in the CVR Agreement);

(x) acquire any material asset or sell, lease or otherwise irrevocably dispose of any of its material assets or properties, or grant any Encumbrance with respect to such assets or properties;

(xi) sell, assign, transfer, license, sublicense or otherwise dispose of any material Parent IP (other than pursuant to non-exclusive licenses in the Ordinary Course of Business);

(xii) make, change or revoke any material Tax election, fail to pay any income or other material Tax as such Tax becomes due and payable, file any amendment making any material

change to any Tax Return, settle or compromise any income or other material Tax liability, enter into any Tax allocation, sharing, indemnification or other similar agreement or arrangement (other than customary commercial contracts entered into in the Ordinary Course of Business the principal subject matter of which is not Taxes), request or consent to any extension or waiver of any limitation period with respect to any claim or assessment for any income or other material Taxes (other than pursuant to an extension of time to file any Tax Return granted in the Ordinary Course of Business of not more than six months), or adopt or change any material accounting method in respect of Taxes;

(xiii) enter into, materially amend or terminate any Parent Material Contract;

(xiv) except as otherwise set forth in the Parent Budget (and other than incurrence or payment of Parent Transaction Expenses up to an aggregate of $100,000 in excess of the amount budgeted for the aggregate Parent Transaction Expenses in the Parent Budget), make any expenditures, incur any Liabilities or discharge or satisfy any Liabilities, in each case, in amounts that exceed the aggregate amount of the Parent Budget;

(xv) other than as required by Law or GAAP, take any action to change accounting policies or procedures;

(xvi) initiate or settle any Legal Proceeding; or

(xvii) agree, resolve or commit to do any of the foregoing.

Nothing contained in this Agreement shall give the Company, directly or indirectly, the right to control or direct the operations of Parent prior to the Effective Time. Prior to the Effective Time, Parent shall exercise, consistent with the terms and conditions of this Agreement, complete unilateral control and supervision over its business operations.

4.2 **Operation of the Company's Business**.

(a) Except as set forth on Section 4.2(a) of the Company Disclosure Schedule, as expressly permitted by this Agreement, as required by applicable Law or unless Parent shall otherwise consent in writing (which consent shall not be unreasonably withheld, delayed or conditioned), during the Pre-Closing Period: each of the Company and its Subsidiaries shall conduct its business and operations in the Ordinary Course of Business and in compliance in all material respects with all applicable Laws and the requirements of all Contracts that constitute Company Material Contracts.

(b) Except (i) as expressly permitted by this Agreement, (ii) as set forth in Section 4.2(b) of the Company Disclosure Schedule, (iii) as required by applicable Law or (iv) with the prior written consent of Parent (which consent shall not be unreasonably withheld, delayed or conditioned), at all times during the Pre-Closing Period, the Company shall not, nor shall it cause or permit any of its Subsidiaries to, do any of the following:

(i) declare, accrue, set aside or pay any dividend or make any other distribution in respect of any shares of its capital stock or repurchase, redeem or otherwise reacquire any shares of its capital stock or other securities (except for shares of Company Common Stock from terminated employees, directors or consultants of the Company);

(ii) sell, issue, grant, pledge or otherwise dispose of or encumber or authorize any of the foregoing with respect to: (A) any capital stock or other security of the Company or any of its Subsidiaries (except for shares of outstanding Company Common Stock issued upon the valid exercise of Company Options or Company Warrants); (B) any option, warrant, right to acquire any capital stock or any other security; or (C) any other instrument convertible into or exchangeable for any capital stock or other security of the Company or any of its Subsidiaries;

(iii) except as required to give effect to anything in contemplation of the Closing, amend any of its or its Subsidiaries' Organizational Documents, or effect or be a party to any merger,

consolidation, share exchange, business combination, recapitalization, reclassification of shares, stock split, reverse stock split or similar transaction except, for the avoidance of doubt, the Contemplated Transactions;

(iv) form any Subsidiary or acquire any equity interest or other interest in any other Entity or enter into a joint venture with any other Entity;

(v) (A) lend money to any Person, (B) incur or guarantee any indebtedness for borrowed money, (C) guarantee any debt securities of others, or (D) make any capital expenditure or commitment in excess of $500,000;

(vi) other than as required by applicable Law or the terms of any Company Benefit Plan as in effect on the date of this Agreement: (A) adopt, terminate, establish or enter into any Company Benefit Plan; (B) cause or permit any Company Benefit Plan to be amended in any material respect; (C) pay any bonus or make any profit-sharing or similar payment to, or increase the amount of the wages, salary, commissions, benefits or other compensation or remuneration payable to, any of its directors, officers or employees; (D) increase the severance or change of control benefits offered to any current or new employees, directors or consultants or (E) terminate or give notice of termination to any (x) officer or (y) employee whose annual base salary is or is expected to be more than $125,000 per year, other than any termination for cause;

(vii) recognize any labor union, labor organization, or similar Person, except as otherwise required by law and after advance notice to the Parent;

(viii) enter into any transaction other than in the Ordinary Course of Business;

(ix) acquire any material asset or sell, lease or otherwise irrevocably dispose of any of its material assets or properties, or grant any Encumbrance with respect to such assets or properties;

(x) sell, assign, transfer, license, sublicense or otherwise dispose of any material Company IP (other than pursuant to non-exclusive licenses in the Ordinary Course of Business);

(xi) make, change or revoke any material Tax election, fail to pay any income or other material Tax as such Tax becomes due and payable, file any amendment making any material change to any Tax Return, settle or compromise any income or other material Tax liability, enter into any Tax allocation, sharing, indemnification or other similar agreement or arrangement (other than customary commercial contracts entered into in the Ordinary Course of Business the principal subject matter of which is not Taxes), request or consent to any extension or waiver of any limitation period with respect to any claim or assessment for any income or other material Taxes (other than pursuant to an extension of time to file any Tax Return granted in the Ordinary Course of Business of not more than six months), or adopt or change any material accounting method in respect of Taxes;

(xii) enter into, materially amend or terminate any Company Material Contract;

(xiii) other than incurrence or payment of any Company Transaction Expenses, make any expenditures, incur any Liabilities or discharge or satisfy any Liabilities, in each case, in amounts that exceed $500,000 in the aggregate;

(xiv) other than as required by Law or GAAP, take any action to change accounting policies or procedures;

(xv) initiate or settle any Legal Proceeding; or

(xvi) agree, resolve or commit to do any of the foregoing.

(c) Nothing contained in this Agreement shall give Parent, directly or indirectly, the right to control or direct the operations of the Company prior to the Effective Time. Prior to the Effective Time, the Company shall exercise, consistent with the terms and conditions of this Agreement, complete unilateral control and supervision over its business operations.

4.3 **Access and Investigation**.

(a) Subject to the terms of the Confidentiality Agreement, which the Parties agree will continue in full force following the date of this Agreement, during the Pre-Closing Period, upon reasonable notice, Parent, on the one hand, and the Company, on the other hand, shall and shall use commercially reasonable efforts to cause such Party's Representatives to: (i) provide the other Party and such other Party's Representatives with reasonable access during normal business hours to such Party's Representatives, personnel, property and assets and to all existing books, records, Tax Returns, work papers and other documents and information relating to such Party and its Subsidiaries; (ii) provide the other Party and such other Party's Representatives with such copies of the existing books, records, Tax Returns, work papers, product data, and other documents and information relating to such Party and its Subsidiaries, and with such additional financial, operating and other data and information regarding such Party and its Subsidiaries as the other Party may reasonably request; (iii) permit the other Party's officers and other employees to meet, upon reasonable notice and during normal business hours, with the chief financial officer and other officers and managers of such Party responsible for such Party's financial statements and the internal controls of such Party to discuss such matters as the other Party may deem necessary or appropriate and; (iv) make available to the other Party copies of unaudited financial statements, material operating and financial reports prepared for senior management or the board of directors of such Party, and any material notice, report or other document filed with or sent to or received from any Governmental Body in connection with the Contemplated Transactions. Any investigation conducted by either Parent or the Company pursuant to this Section 4.3 shall be conducted in such manner as not to interfere unreasonably with the conduct of the business of the other Party.

(b) Notwithstanding the foregoing, any Party may restrict the foregoing access to the extent that any Law applicable to such Party requires such Party to restrict or prohibit access to any such properties or information.

4.4 **Parent Non-Solicitation**.

(a) Parent agrees that, during the Pre-Closing Period, it shall not, and shall not authorize any of its Representatives to, directly or indirectly: (i) solicit, initiate or knowingly encourage, induce or facilitate the communication, making, submission or announcement of any Acquisition Proposal or Acquisition Inquiry or take any action that could reasonably be expected to lead to an Acquisition Proposal or Acquisition Inquiry; (ii) furnish any non-public information regarding Parent to any Person in connection with or in response to an Acquisition Proposal or Acquisition Inquiry; (iii) engage in discussions or negotiations with any Person with respect to any Acquisition Proposal or Acquisition Inquiry; (iv) approve, endorse or recommend any Acquisition Proposal (subject to Section 5.3); (v) execute or enter into any letter of intent or any Contract contemplating or otherwise relating to any Acquisition Transaction (other than a confidentiality agreement permitted under this Section 4.4(a)); or (vi) publicly propose to do any of the foregoing; *provided*, *however*, that, notwithstanding anything contained in this Section 4.4 and subject to compliance with this Section 4.4, prior to obtaining the Required Parent Stockholder Vote, Parent may furnish non-public information regarding Parent to, and enter into discussions or negotiations with, any Person in response to a *bona fide* Acquisition Proposal by such Person, which the Parent Board determines in good faith, after consultation with Parent's outside financial advisors and outside legal counsel, constitutes, or is reasonably likely to result in, a Superior Offer (and is not withdrawn) if: (A) neither Parent nor any of its Representatives shall have breached this Section 4.4 in any material respect, (B) the Parent Board concludes in good faith based on the advice of outside legal counsel, that the failure to take such action is reasonably likely to be inconsistent with the fiduciary duties of the Parent Board under applicable Law; (C) at least two (2) Business Days prior to furnishing such nonpublic confidential information to, or entering into discussions with, such Person, Parent gives the Company written notice of the identity of such Person and of Parent's intention to furnish nonpublic information to, or enter into discussions with, such Person; (D) Parent receives from such Person an executed confidentiality agreement containing provisions, in the aggregate, at least as favorable to Parent as those contained in the Confidentiality Agreement; and (E) at least two (2) Business Days prior to furnishing any such nonpublic information to such Person, Parent furnishes such

nonpublic information to the Company (to the extent such information has not been previously furnished by Parent to the Company). Without limiting the generality of the foregoing, Parent acknowledges and agrees that, in the event any Representative of Parent (whether or not such Representative is purporting to act on behalf of Parent) takes any action that, if taken by Parent, would constitute a breach of this Section 4.4, the taking of such action by such Representative shall be deemed to constitute a breach of this Section 4.4 by Parent for purposes of this Agreement.

(b) If Parent or any Representative of Parent receives an Acquisition Proposal or Acquisition Inquiry at any time during the Pre-Closing Period, then Parent shall promptly (and in no event later than twenty-four (24) hours after Parent becomes aware of such Acquisition Proposal or Acquisition Inquiry) advise the Company orally and in writing of such Acquisition Proposal or Acquisition Inquiry (including the identity of the Person making or submitting such Acquisition Proposal or Acquisition Inquiry, and the material terms thereof). Parent shall keep the Company reasonably informed with respect to the status and material terms of any such Acquisition Proposal or Acquisition Inquiry and any material modification or proposed material modification thereto.

(c) Parent shall immediately cease and cause to be terminated any existing discussions, negotiations and communications with any Person that relate to any Acquisition Proposal or Acquisition Inquiry as of the date of this Agreement and request the destruction or return of any nonpublic information of Parent provided to such Person.

4.5 **Company Non-Solicitation**.

(a) The Company agrees that, during the Pre-Closing Period, neither it nor any of its Subsidiaries shall, nor shall it or any of its Subsidiaries authorize any of its Representatives to, directly or indirectly: (i) solicit, initiate or knowingly encourage, induce or facilitate the communication, making, submission or announcement of any Acquisition Proposal or Acquisition Inquiry or take any action that could reasonably be expected to lead to an Acquisition Proposal or Acquisition Inquiry; (ii) furnish any non-public information regarding the Company or any of its Subsidiaries to any Person in connection with or in response to an Acquisition Proposal or Acquisition Inquiry; (iii) engage in discussions or negotiations with any Person with respect to any Acquisition Proposal or Acquisition Inquiry; (iv) approve, endorse or recommend any Acquisition Proposal; (v) execute or enter into any letter of intent or any Contract contemplating or otherwise relating to any Acquisition Transaction; or (vi) publicly propose to do any of the foregoing *provided*, *however*, that, notwithstanding anything contained in this Section 4.5 and subject to compliance with this Section 4.5, prior to obtaining the Required Company Stockholder Vote, the Company may furnish non-public information regarding the Company to, and enter into discussions or negotiations with, any Person in response to a *bona fide* Acquisition Proposal by such Person, which the Company Board determines in good faith, after consultation with the Company's outside financial advisors and outside legal counsel, constitutes, or is reasonably likely to result in, a Superior Offer (and is not withdrawn) if: (A) neither the Company nor any of its Representatives shall have breached this Section 4.5 in any material respect, (B) the Company Board concludes in good faith based on the advice of outside legal counsel, that the failure to take such action is reasonably likely to be inconsistent with the fiduciary duties of the Company Board under applicable Law; (C) at least two (2) Business Days prior to furnishing such nonpublic confidential information to, or entering into discussions with, such Person, the Company gives Parent written notice of the identity of such Person and of the Company's intention to furnish nonpublic information to, or enter into discussions with, such Person; (D) the Company receives from such Person an executed confidentiality agreement containing provisions, in the aggregate, at least as favorable to the Company as those contained in the Confidentiality Agreement; and (E) at least two (2) Business Days prior to furnishing any such nonpublic information to such Person, the Company furnishes such nonpublic information to Parent (to the extent such information has not been previously furnished by the Company to Parent). Without limiting the generality of the foregoing, the Company acknowledges and agrees that, in the event any Representative of the Company (whether or not such Representative is purporting to act on behalf of the Company) takes any action that, if taken by the Company, would constitute a breach of this Section 4.5, the

taking of such action by such Representative shall be deemed to constitute a breach of this Section 4.5 by the Company for purposes of this Agreement.

(b) If the Company or any Representative of the Company receives an Acquisition Proposal or Acquisition Inquiry at any time during the Pre-Closing Period, then the Company shall promptly (and in no event later than twenty-four (24) hours after the Company becomes aware of such Acquisition Proposal or Acquisition Inquiry) advise Parent orally and in writing of such Acquisition Proposal or Acquisition Inquiry (including the identity of the Person making or submitting such Acquisition Proposal or Acquisition Inquiry, and the material terms thereof). The Company shall keep Parent reasonably informed with respect to the status and material terms of any such Acquisition Proposal or Acquisition Inquiry and any material modification or proposed material modification thereto.

(c) The Company shall immediately cease and cause to be terminated any existing discussions, negotiations and communications with any Person that relate to any Acquisition Proposal or Acquisition Inquiry as of the date of this Agreement and request the destruction or return of any nonpublic information of the Company or any of its Subsidiaries provided to such Person.

4.6 **Notification of Certain Matters**.

(a) During the Pre-Closing Period, the Company shall promptly notify Parent (and, if in writing, furnish copies of) if any of the following occurs: (i) any notice or other communication is received from any Person alleging that the Consent of such Person is or may be required in connection with any of the Contemplated Transactions; (ii) any Legal Proceeding against or involving or otherwise affecting the Company or its Subsidiaries is commenced, or, to the Knowledge of the Company, threatened against the Company or its Subsidiaries or, to the Knowledge of the Company, any director or officer of the Company or its Subsidiaries; (iii) the Company becomes aware of any inaccuracy in any representation or warranty made by it in this Agreement; or (iv) the failure of the Company to comply with any covenant or obligation of the Company; in the case of (iii) and (iv) that could reasonably be expected to make the timely satisfaction of any of the conditions set forth in Sections 6 or 7, as applicable, impossible or materially less likely. No notification given to Parent pursuant to this Section 4.6(a) shall change, limit or otherwise affect any of the representations, warranties, covenants or obligations of the Company or any of its Subsidiaries contained in this Agreement or the Company Disclosure Schedule for purposes of Sections 6 and 7, as applicable.

(b) During the Pre-Closing Period, Parent shall promptly notify the Company (and, if in writing, furnish copies of) if any of the following occurs: (i) any notice or other communication is received from any Person alleging that the Consent of such Person is or may be required in connection with any of the Contemplated Transactions; (ii) any Legal Proceeding against or involving or otherwise affecting Parent is commenced, or, to the Knowledge of Parent, threatened against Parent or, to the Knowledge of Parent, any director or officer of Parent; (iii) Parent becomes aware of any inaccuracy in any representation or warranty made by it in this Agreement; or (iv) the failure of Parent to comply with any covenant or obligation of Parent or Merger Sub; in the case of (iii) and (iv) that could reasonably be expected to make the timely satisfaction of any of the conditions set forth in Sections 6 or 8, as applicable, impossible or materially less likely. No notification given to the Company pursuant to this Section 4.6(b) shall change, limit or otherwise affect any of the representations, warranties, covenants or obligations of Parent contained in this Agreement or the Parent Disclosure Schedule for purposes of Sections 6 and 8, as applicable.

Section 5. ADDITIONAL AGREEMENTS OF THE PARTIES

5.1 **Registration Statement; Proxy Statement**.

(a) As promptly as practicable after the date of this Agreement (but in no event later than 30 days following the date of this Agreement), the Company shall prepare, and Parent shall cause to be filed with

the SEC, the Registration Statement, in which the Proxy Statement will be included as a prospectus. Parent covenants and agrees that the information provided by Parent or its Subsidiaries to the Company for inclusion in the Proxy Statement, including any pro forma financial statements included therein (and the letter to stockholders, notice of meeting and form of proxy included therewith), will not, at the time that the Proxy Statement or any amendment or supplement thereto is filed with the SEC or is first mailed to the Parent stockholders contain any untrue statement of a material fact or omit to state any material fact required to be stated therein or necessary in order to make the statements made therein, in light of the circumstances under which they were made, not misleading. The Company covenants and agrees that the information provided by the Company or its Subsidiaries to Parent for inclusion in the Proxy Statement (including the Company Financials) will not contain any untrue statement of a material fact or omit to state any material fact required to be stated therein or necessary in order to make such information not misleading. Notwithstanding the foregoing, (i) Parent makes no covenant, representation or warranty with respect to statements made in the Proxy Statement (and the letter to stockholders, notice of meeting and form of proxy included therewith), if any, based on information provided by the Company or its Subsidiaries or any of their Representatives specifically for inclusion therein and (ii) the Company makes no covenant, representation or warranty with respect to statements made in the Proxy Statement (and the letter to stockholders, notice of meeting and form of proxy included therewith), if any, other than with respect to the information provided by the Company or its Subsidiaries or any of their Representatives for inclusion therein. Parent and its legal counsel shall be given reasonable opportunity to review and comment on the Proxy Statement, including all amendments and supplements thereto, prior to the filing thereof with the SEC, and on the response to any comments of the SEC on the Proxy Statement, prior to the filing thereof with the SEC. Each of the Parties shall use commercially reasonable efforts to cause the Registration Statement and the Proxy Statement to comply with the applicable rules and regulations promulgated by the SEC, to respond promptly to any comments of the SEC or its staff and to have the Registration Statement declared effective under the Securities Act as promptly as practicable after it is filed with the SEC. Parent shall use commercially reasonable efforts to cause the Proxy Statement to be mailed to Parent's stockholders as promptly as practicable after the Registration Statement is declared effective under the Securities Act. Each Party shall promptly furnish to the other Party all information concerning such Party and such Party's Affiliates and such Party's stockholders that may be required or reasonably requested in connection with any action contemplated by this Section 5.1. If Parent, Merger Sub or the Company become aware of any event or information that, pursuant to the Securities Act or the Exchange Act, should be disclosed in an amendment or supplement to the Registration Statement or Proxy Statement, as the case may be, then such Party, as the case may be, shall promptly inform the other Parties thereof and shall cooperate with such other Parties in filing such amendment or supplement with the SEC and, if appropriate, in mailing such amendment or supplement to the Parent stockholders.

(b) Prior to the Effective Time, Parent shall use commercially reasonable efforts to obtain all regulatory approvals needed to ensure that the Parent Common Stock to be issued in the Merger (to the extent required) shall be registered or qualified or exempt from registration or qualification under the securities law of every jurisdiction of the United States in which any registered holder of Company Capital Stock has an address of record on the applicable record date for determining the holders of Company Capital Stock entitled to notice and to vote pursuant to the Company Stockholder Written Consent.

(c) Parent shall reasonably cooperate with the Company and provide, and require its Representatives to provide, the Company and its Representatives, with all true, correct and complete information regarding Parent or its Subsidiaries that is required by Law to be included in the Registration Statement or reasonably requested by the Company to be included in the Registration Statement. The Company will use commercially reasonable efforts to cause to be delivered to Parent a consent letter of the Company's independent accounting firm, dated no more than two Business Days before the date on which the Registration Statement becomes effective (and reasonably satisfactory in form and substance to Parent), that is customary in scope and substance for consent letters delivered by independent public accountants in connection with registration statements similar to the Registration Statement.

(d) For the avoidance of doubt, the Company shall use commercially reasonable efforts to undertake, or shall cause its Representatives to undertake, the actions contemplated in the definition of "Combined Transaction Expenses".

5.2 **Company Information Statement; Stockholder Written Consent**.

(a) Promptly after the Registration Statement shall have been declared effective under the Securities Act, and in any event no later than three Business Days thereafter, the Company shall prepare, with the cooperation of Parent, and commence mailing to its stockholders an information statement (the "***Information Statement***") to solicit the Company Stockholder Consent evidencing the Required Company Stockholder Vote for purposes of (within 10 Business Days after the Registration Statement shall have been declared effective) (i) adopting and approving this Agreement and the Contemplated Transactions, (ii) acknowledging that the approval given thereby is irrevocable and that such stockholder is aware of its rights to demand appraisal for its shares pursuant to Section 262 of the DGCL, a true and correct copy of which will be attached thereto, and that such stockholder has received and read a copy of Section 262 of the DGCL, (iii) acknowledging that by its approval of the Merger it is not entitled to appraisal rights with respect to its shares in connection with the Merger and thereby waives any rights to receive payment of the fair value of its capital stock under the DGCL, and (iv) the Preferred Stock Conversion (collectively, the "***Company Stockholder Matters***"). Under no circumstances shall the Company assert that any other approval or consent is necessary by its stockholders to approve the Company Stockholder Matters. All materials (including any amendments thereto) submitted to the stockholders of the Company in accordance with this Section 5.2(a) shall be subject to Parent's advance review and reasonable approval.

(b) The Company covenants and agrees that the Information Statement, including any pro forma financial statements included therein (and the letter to stockholders and form of Company Stockholder Written Consent included therewith), will not, at the time that the Information Statement or any amendment or supplement thereto is first mailed to the stockholders of the Company, at the time of receipt of the Required Company Stockholder Vote and at the Effective Time, contain any untrue statement of a material fact or omit to state any material fact required to be stated therein or necessary in order to make the statements made therein, in light of the circumstances under which they were made, not misleading. Notwithstanding the foregoing, the Company makes no covenant, representation or warranty with respect to statements made in the Information Statement (and the letter to the stockholders and form of Company Stockholder Written Consent included therewith), if any, based on information furnished in writing by Parent specifically for inclusion therein. Each of the Parties shall use commercially reasonable efforts to cause the Information Statement to comply with the applicable rules and regulations promulgated by the SEC in all material respects.

(c) Promptly following receipt of the Required Company Stockholder Vote, the Company shall prepare and mail a notice (the "***Stockholder Notice***") to every stockholder of the Company that did not execute the Company Stockholder Written Consent. The Stockholder Notice shall (i) be a statement to the effect that the Company Board determined that the Merger is advisable in accordance with Section 251(b) of the DGCL and in the best interests of the stockholders of the Company and approved and adopted this Agreement, the Merger and the other Contemplated Transactions, (ii) provide the stockholders of the Company to whom it is sent with notice of the actions taken in the Company Stockholder Written Consent, including the adoption and approval of this Agreement, the Merger and the other Contemplated Transactions in accordance with Section 228(e) of the DGCL and the certificate of incorporation and bylaws of the Company and (iii) include a description of the appraisal rights of the Company's stockholders available under the DGCL, along with such other information as is required thereunder and pursuant to applicable Law. All materials (including any amendments thereto) submitted to the stockholders of the Company in accordance with this Section 5.2(c) shall be subject to Parent's advance review and reasonable approval.

(d) The Company agrees that: (i) the Company Board shall recommend that the Company's stockholders vote to approve the Company Stockholder Matters and shall use reasonable best efforts to solicit

such approval from each of the Company stockholders necessary to deliver the Company Stockholder Written Consent evidencing the Required Company Stockholder Vote within the time set forth in Section 5.2(a) (the recommendation of the Company Board that the Company's stockholders vote to adopt and approve this Agreement being referred to as the "***Company Board Recommendation***"); and (ii) the Company Board Recommendation shall not be withdrawn or modified (and the Company Board shall not publicly propose to withdraw or modify the Company Board Recommendation) in a manner adverse to Parent, and no resolution by the Company Board or any committee thereof to withdraw or modify the Company Board Recommendation in a manner adverse to Parent or to adopt, approve or recommend (or publicly propose to adopt, approve or recommend) any Acquisition Proposal shall be adopted or proposed (the actions set forth in the foregoing clause (ii), collectively, a "***Company Board Adverse Recommendation Change***").

(e) Notwithstanding anything to the contrary contained in this Agreement, if at any time prior to the approval of Company Stockholder Matters by the Required Company Stockholder Vote:

(i) if Company has received a written Acquisition Proposal (which Acquisition Proposal did not arise out of a material breach of Section 4.5) from any Person that has not been withdrawn and after consultation with outside legal counsel, the Company Board shall have determined, in good faith, that such Acquisition Proposal is a Superior Offer, the Company Board may make a Company Board Adverse Recommendation Change, if and only if: (A) the Company Board determines in good faith, after consultation with Company's outside legal counsel, that the failure to do so could be inconsistent with the fiduciary duties of the Company Board to the Company's stockholders under applicable Law; (B) Company shall have given the Parent prior written notice of its intention to consider making a Company Board Adverse Recommendation Change or terminate this Agreement pursuant to Section 9.1(g) at least four Business Days prior to making any such Company Board Adverse Recommendation Change or termination (a "***Company Determination Notice***") (which notice shall not constitute a Company Board Adverse Recommendation Change); and (C) (1) the Company shall have provided to Parent a summary of the material terms and conditions of the Acquisition Proposal in accordance with Section 4.5(b), (2) the Company shall have given Parent the four Business Days after the Company Determination Notice to propose revisions to the terms of this Agreement or make another proposal and shall have made its Representatives reasonably available to negotiate in good faith with Parent (to the extent Parent desires to negotiate) with respect to such proposed revisions or other proposal, if any, and (3) after considering the results of any such negotiations and giving effect to the proposals made by Parent, if any, after consultation with outside legal counsel, the Company Board shall have determined, in good faith, that such Acquisition Proposal is a Superior Offer and that the failure to make the Company Board Adverse Recommendation Change or terminate this Agreement pursuant to Section 9.1(g) could be inconsistent with the fiduciary duties of the Company Board to the Company's stockholders under applicable Law. For the avoidance of doubt, the provisions of this Section 5.2(e)(i) shall also apply to any material change to the facts and circumstances relating to such Acquisition Proposal and require a new Company Determination Notice, except that the references to four Business Days shall be deemed to be three Business Days.

(ii) other than in connection with an Acquisition Proposal, the Company Board may make a Company Board Adverse Recommendation Change in response to a Company Change in Circumstance, if and only if: (A) the Company Board determines in good faith, after consultation with the Company's outside legal counsel, that the failure to do so could be inconsistent with the fiduciary duties of the Company Board to Parent's stockholders under applicable Law; (B) the Company shall have given Parent a Company Determination Notice at least four Business Days prior to making any such Company Board Adverse Recommendation Change; and (C) (1) Company shall have specified the Company Change in Circumstance in reasonable detail, (2) the Company shall have given Parent the four Business Days after the Company Determination Notice to propose revisions to the terms of this Agreement or make another

proposal, and shall have made its Representatives reasonably available to negotiate in good faith with Parent (to the extent Parent desires to do so) with respect to such proposed revisions or other proposal, if any, and (3) after considering the results of any such negotiations and giving effect to the proposals made by Parent, if any, after consultation with outside legal counsel, the Company Board shall have determined, in good faith, that the failure to make the Company Board Adverse Recommendation Change in response to such Company Change in Circumstance could be inconsistent with the fiduciary duties of the Company Board to the Company's stockholders under applicable Law. For the avoidance of doubt, the provisions of this Section 5.2(e)(ii) shall also apply to any material change to the facts and circumstances relating to such Company Change in Circumstance and require a new Company Determination Notice, except that the references to four Business Days shall be deemed to be three Business Days.

(f) The Company's obligation to solicit the consent of its stockholders to sign the Company Stockholder Written Consent in accordance with Section 5.2(a) and Section 5.2(d) shall not be limited or otherwise affected by the commencement, disclosure, announcement or submission of any Superior Offer or other Acquisition Proposal.

5.3 **Parent Stockholders' Meeting**.

(a) Promptly after the Registration Statement has been declared effective by the SEC under the Securities Act, Parent shall take all action necessary under applicable Law to call, give notice of and hold a meeting of the holders of Parent Common Stock for the purpose of seeking approval of:

(i) the amendment of Parent's certificate of incorporation to effect the Nasdaq Reverse Split;

(ii) this Agreement, including the issuance of shares of Parent Common Stock to the Company's stockholders in connection with the Contemplated Transactions;

(iii) the change of control of Parent resulting from the Merger pursuant to the Nasdaq rules;

(iv) the 2019 Plan (as defined in Section 5.20(a)); and

(v) in accordance with Section 14A of the Exchange Act and the applicable SEC rules issued thereunder, seeking advisory approval of a proposal to the Parent's stockholders for a non-binding, advisory vote to approve certain compensation that may become payable to Parent's named executed officers in connection with the completion of the Merger, if applicable (the matters contemplated by the clauses 5.3(a)(i) – (iii) are referred to as the "***Parent Stockholder Matters***," and the matters contemplated by clauses 5.3(a)(iv) – (v) is referred to herein as the "***Other Parent Stockholder Matters***," and such meeting, the "***Parent Stockholders' Meeting***").

(b) The Parent Stockholders' Meeting shall be held as promptly as practicable after the Registration Statement is declared effective under the Securities Act. Parent shall take reasonable measures to ensure that all proxies solicited in connection with the Parent Stockholders' Meeting are solicited in compliance with all applicable Law. Notwithstanding anything to the contrary contained herein, if on the date of the Parent Stockholders' Meeting, or a date preceding the date on which the Parent Stockholders' Meeting is scheduled, Parent reasonably believes that (i) it will not receive proxies sufficient to obtain the Required Parent Stockholder Vote, whether or not a quorum would be present or (ii) it will not have sufficient shares of Parent Common Stock represented (whether in person or by proxy) to constitute a quorum necessary to conduct the business of the Parent Stockholders' Meeting, Parent may postpone or adjourn, or make one or more successive postponements or adjournments of, the Parent Stockholders' Meeting as long as the date of the Parent Stockholders' Meeting is not postponed or adjourned more than an aggregate of 30 calendar days in connection with any postponements or adjournments.

(c) Parent agrees that, subject to Section 5.3(d): (i) the Parent Board shall recommend that the holders of Parent Common Stock vote to approve the Parent Stockholder Matters and shall use commercially

reasonable efforts to solicit such approval, (ii) the Proxy Statement shall include a statement to the effect that the Parent Board recommends that Parent's stockholders vote to approve the Parent Stockholder Matters (the recommendation of the Parent Board with respect to the Parent Stockholder Matters being referred to as the "***Parent Board Recommendation***"); and (iii) the Parent Board Recommendation shall not be withheld, amended, withdrawn or modified (and the Parent Board shall not publicly propose to withhold, amend, withdraw or modify the Parent Board Recommendation) in a manner adverse to the Company (the actions set forth in the foregoing clause (iii), collectively, a "***Parent Board Adverse Recommendation Change***").

(d) Notwithstanding anything to the contrary contained in this Agreement, if at any time prior to the approval of Parent Stockholder Matters by the Required Parent Stockholder Vote:

(i) if Parent has received a written Acquisition Proposal (which Acquisition Proposal did not arise out of a material breach of Section 4.4) from any Person that has not been withdrawn and after consultation with outside legal counsel, the Parent Board shall have determined, in good faith, that such Acquisition Proposal is a Superior Offer, the Parent Board may make a Parent Board Adverse Recommendation Change, if and only if: (A) the Parent Board determines in good faith, after consultation with Parent's outside legal counsel, that the failure to do so could be inconsistent with the fiduciary duties of the Parent Board to Parent's stockholders under applicable Law; (B) Parent shall have given the Company prior written notice of its intention to consider making a Parent Board Adverse Recommendation Change or terminate this Agreement pursuant to Section 9.1(f) at least four Business Days prior to making any such Parent Board Adverse Recommendation Change or termination (a "***Determination Notice***") (which notice shall not constitute a Parent Board Adverse Recommendation Change); and (C) (1) Parent shall have provided to the Company a summary of the material terms and conditions of the Acquisition Proposal in accordance with Section 4.4(b), (2) Parent shall have given the Company the four Business Days after the Determination Notice to propose revisions to the terms of this Agreement or make another proposal and shall have made its Representatives reasonably available to negotiate in good faith with the Company (to the extent the Company desires to negotiate) with respect to such proposed revisions or other proposal, if any, and (3) after considering the results of any such negotiations and giving effect to the proposals made by the Company, if any, after consultation with outside legal counsel, the Parent Board shall have determined, in good faith, that such Acquisition Proposal is a Superior Offer and that the failure to make the Parent Board Adverse Recommendation Change or terminate this Agreement pursuant to Section 9.1(f) could be inconsistent with the fiduciary duties of the Parent Board to Parent's stockholders under applicable Law. For the avoidance of doubt, the provisions of this Section 5.3(d)(i) shall also apply to any material change to the facts and circumstances relating to such Acquisition Proposal and require a new Determination Notice, except that the references to four Business Days shall be deemed to be three Business Days.

(ii) other than in connection with an Acquisition Proposal, the Parent Board may make a Parent Board Adverse Recommendation Change in response to a Parent Change in Circumstance, if and only if: (A) the Parent Board determines in good faith, after consultation with Parent's outside legal counsel, that the failure to do so could be inconsistent with the fiduciary duties of the Parent Board to Parent's stockholders under applicable Law; (B) Parent shall have given the Company a Determination Notice at least four Business Days prior to making any such Parent Board Adverse Recommendation Change; and (C) (1) Parent shall have specified the Parent Change in Circumstance in reasonable detail, (2) Parent shall have given the Company the four Business Days after the Determination Notice to propose revisions to the terms of this Agreement or make another proposal, and shall have made its Representatives reasonably available to negotiate in good faith with the Company (to the extent the Company desires to do so) with respect to such proposed revisions or other proposal, if any, and (3) after considering the results of any such negotiations and giving effect to the proposals made by the Company, if any, after consultation with outside legal counsel, the Parent Board shall have determined, in good faith, that

the failure to make the Parent Board Adverse Recommendation Change in response to such Parent Change in Circumstance could be inconsistent with the fiduciary duties of the Parent Board to Parent's stockholders under applicable Law. For the avoidance of doubt, the provisions of this Section 5.3(d)(ii) shall also apply to any material change to the facts and circumstances relating to such Parent Change in Circumstance and require a new Determination Notice, except that the references to four Business Days shall be deemed to be three Business Days.

(e) Parent's obligation to solicit the consent of its stockholders to approve the Parent Stockholder Matters shall not be limited or otherwise affected by the commencement, disclosure, announcement or submission of any Superior Offer or other Acquisition Proposal.

(f) Nothing contained in this Agreement shall prohibit Parent or the Parent Board from (i) complying with Rules 14d-9 and 14e-2(a) promulgated under the Exchange Act, (ii) issuing a "stop, look and listen" communication or similar communication of the type contemplated by Section 14d-9(f) under the Exchange Act or (iii) otherwise making any disclosure to the Parent stockholders; *provided however*, that in the case of the foregoing clause (iii) the Parent Board determines in good faith, after consultation with its outside legal counsel, that failure to make such disclosure is reasonably likely to be inconsistent with applicable Law, including its fiduciary duties under applicable Law.

5.4 **Regulatory Approvals**.

(a) Each party hereto shall (i) consult and cooperate with one another, and consider in good faith the views of one another, in connection with any analyses, appearances, presentations, memoranda, briefs, arguments, opinions and proposals made or submitted by or on behalf of any party hereto in connection with proceedings under or relating to the HSR Act or any foreign or other antitrust Law, (ii) coordinate with one another in preparing and exchanging such materials and (iii) promptly provide one another (and its counsel) with copies of all filings, presentations or submissions made by such party to any Governmental Body in connection with this Agreement. In addition, any party may, as it deems advisable and necessary, reasonably designate any confidential and competitively sensitive material provided to the other parties under this Section 5.4 as "Outside Counsel Only" or redact information regarding valuation or negotiation strategy. Materials identified as "Outside Counsel Only" and the information contained therein shall be given only to the outside legal counsel of the recipient and will not be disclosed by such outside counsel to employees, officers, or directors of the recipient, unless express written permission is obtained in advance from the source of the materials.

(b) Each of Parent and the Company shall use its respective reasonable best efforts to resolve objections, if any, as may be asserted by any Governmental Body with respect to the Contemplated Transactions under any applicable antitrust Laws, including responding promptly to and complying with any requests for information relating to this Agreement or any initial filings required under the HSR Act and any other additional filings ("***Merger Notification Filings***") from any Governmental Body charged with enforcing, applying, administering or investigating any antitrust Laws.

(c) Notwithstanding anything to the contrary herein (i) neither Party shall have any obligation to litigate or contest any such Legal Proceeding or order resulting therefrom and (ii) neither Party shall be under an obligation to make proposals, execute or carry out agreements or submit to orders providing for (A) the sale, license, divestiture, or other disposition or holding separate of any assets of Parent or the Company or any of their respective Affiliates, (B) the imposition of any limitation or restriction on the ability of Parent or the Company or any of their respective Affiliates to freely conduct their business, or (C) any limitation or regulation on the ability of Parent or any of its Affiliates to exercise full rights of ownership of the Company.

5.5 **Company Options and Company Warrants**.

(a) At the Effective Time, each Company Option that is outstanding and unexercised immediately prior to the Effective Time under the Company Plan, whether or not vested, shall be converted into

and become an option to purchase Parent Common Stock, and Parent shall assume the Company Plan and each such Company Option in accordance with the terms (as in effect as of the date of this Agreement) of the Company Plan and the terms of the stock option agreement by which such Company Option is evidenced (but with changes to such documents as Parent and the Company mutually agree are appropriate to reflect the substitution of the Company Options by Parent to purchase shares of Parent Common Stock). All rights with respect to Company Common Stock under Company Options assumed by Parent shall thereupon be converted into rights with respect to Parent Common Stock. Accordingly, from and after the Effective Time: (i) each Company Option assumed by Parent may be exercised solely for shares of Parent Common Stock; (ii) the number of shares of Parent Common Stock subject to each Company Option assumed by Parent shall be determined by multiplying (A) the number of shares of Company Common Stock that were subject to such Company Option, as in effect immediately prior to the Effective Time, by (B) the Exchange Ratio, and rounding the resulting number down to the nearest whole number of shares of Parent Common Stock; (iii) the per share exercise price for the Parent Common Stock issuable upon exercise of each Company Option assumed by Parent shall be determined by dividing (A) the per share exercise price of Company Common Stock subject to such Company Option, as in effect immediately prior to the Effective Time, by (B) the Exchange Ratio and rounding the resulting exercise price up to the nearest whole cent; and (iv) any restriction on the exercise of any Company Option assumed by Parent shall continue in full force and effect and the term, exercisability, vesting schedule and other provisions of such Company Option shall otherwise remain unchanged; *provided, however*, that: (A) to the extent provided under the terms of a Company Option and the Company Plans, such Company Option may be further adjusted as necessary to reflect Parent's substitution of the Company Options with options to purchase Parent Common Stock (such as by making any change in control or similar definition relate to Parent and having any provision that provides for the adjustment of Company Options upon the occurrence of certain corporate events relate to corporate events that relate to Parent and/or Parent Common Stock); and (B) the Parent Board or a committee thereof shall succeed to the authority and responsibility of the Company Board or any committee thereof with respect to each Company Option assumed by Parent. Notwithstanding anything to the contrary in this Section 5.5(a), the conversion of each Company Option (regardless of whether such option qualifies as an "incentive stock option" within the meaning of Section 422 of the Code) into an option to purchase shares of Parent Common Stock shall be made in a manner consistent with Treasury Regulation Section 1.424-1, such that the conversion of a Company Option shall not constitute a "modification" of such Company Option for purposes of Section 409A or Section 424 of the Code.

(b) Parent shall file with the SEC, promptly after the Effective Time, a registration statement on Form S-8 (or any successor or alternative form), relating to the shares of Parent Common Stock issuable with respect to Company Options assumed by Parent in accordance with Section 5.5(a).

(c) At the Effective Time, each Company Warrant that is outstanding and unexercised as of immediately prior to the Effective Time (for the avoidance of doubt, excluding Company Warrants that are deemed to have been automatically exercised or terminated pursuant to their terms as a result of the consummation of the Merger or the Preferred Stock Conversion), if any, shall be converted into and become a warrant to purchase Parent Common Stock and Parent shall assume each such Company Warrant in accordance with its terms. All rights with respect to Company Capital Stock under Company Warrants assumed by Parent shall thereupon be converted into rights with respect to Parent Common Stock. Accordingly, from and after the Effective Time: (i) each Company Warrant assumed by Parent may be exercised solely for shares of Parent Common Stock; (ii) the number of shares of Parent Common Stock subject to each Company Warrant assumed by Parent shall be determined by multiplying (A) the number of shares of Company Common Stock, or the number of shares of Company Preferred Stock issuable upon exercise of the Company Warrant, as applicable, that were subject to such Company Warrant immediately prior to the Effective Time by (B) the Exchange Ratio and rounding the resulting number down to the nearest whole number of shares of Parent Common Stock; (iii) the per share exercise price for the Parent Common Stock issuable upon exercise of each Company Warrant assumed by Parent shall be determined by dividing the per share exercise price of Company Capital Stock subject to such Company Warrant, as in effect immediately prior to the Effective Time, by the Exchange Ratio and rounding the resulting exercise price up to the nearest whole cent; and (iv) any restriction on any Company

Warrant assumed by Parent shall continue in full force and effect and the term and other provisions of such Company Warrant shall otherwise remain unchanged.

(d) Prior to the Effective Time, the Company shall take all actions that may be necessary (under the Company Plan, the Company Warrants, and otherwise) to effectuate the provisions of this Section 5.5 and to ensure that, from and after the Effective Time, holders of Company Options, and Company Warrants have no rights with respect thereto other than those specifically provided in this Section 5.5.

5.6 **Indemnification of Officers and Directors**.

(a) From the Effective Time through the sixth anniversary of the date on which the Effective Time occurs, each of Parent and the Surviving Corporation shall indemnify and hold harmless each person who is now, or has been at any time prior to the date hereof, or who becomes prior to the Effective Time, a director or officer of Parent or the Company and their respective Subsidiaries, respectively (the "***D&O Indemnified Parties***"), against all claims, losses, liabilities, damages, judgments, fines and reasonable fees, costs and expenses, including attorneys' fees and disbursements (collectively, "***Costs***"), incurred in connection with any claim, action, suit, proceeding or investigation, whether civil, criminal, administrative or investigative, arising out of or pertaining to the fact that the D&O Indemnified Party is or was a director or officer of Parent or of the Company, whether asserted or claimed prior to, at or after the Effective Time, in each case, to the fullest extent permitted under applicable Law. Each D&O Indemnified Party will be entitled to advancement of expenses incurred in the defense of any such claim, action, suit, proceeding or investigation from each of Parent and the Surviving Corporation, jointly and severally, upon receipt by Parent or the Surviving Corporation from the D&O Indemnified Party of a request therefor; *provided* that any such person to whom expenses are advanced provides an undertaking to Parent, to the extent then required by the DGCL, to repay such advances if it is ultimately determined that such person is not entitled to indemnification.

(b) The provisions of the certificate of incorporation and bylaws of Parent with respect to indemnification, advancement of expenses and exculpation of present and former directors and officers of Parent that are presently set forth in the certificate of incorporation and bylaws of Parent shall not be amended, modified or repealed for a period of six years from the Effective Time in a manner that would adversely affect the rights thereunder of individuals who, at or prior to the Effective Time, were officers or directors of Parent. The certificate of incorporation and bylaws of the Surviving Corporation shall contain, and Parent shall cause the certificate of incorporation and bylaws of the Surviving Corporation to so contain, provisions no less favorable with respect to indemnification, advancement of expenses and exculpation of present and former directors and officers as those presently set forth in the certificate of incorporation and bylaws of Parent.

(c) From and after the Effective Time, (i) the Surviving Corporation shall fulfill and honor in all respects the obligations of the Company to its D&O Indemnified Parties as of immediately prior to the Closing pursuant to any indemnification provisions under the Company's Organizational Documents and pursuant to any indemnification agreements between the Company and such D&O Indemnified Parties, with respect to claims arising out of matters occurring at or prior to the Effective Time and (ii) Parent shall fulfill and honor in all respects the obligations of Parent to its D&O Indemnified Parties as of immediately prior to the Closing pursuant to any indemnification provisions under Parent's Organizational Documents and pursuant to any indemnification agreements between Parent and such D&O Indemnified Parties, with respect to claims arising out of matters occurring at or prior to the Effective Time.

(d) From and after the Effective Time, Parent shall maintain directors' and officers' liability insurance policies, with an effective date as of the Closing Date, on commercially available terms and conditions and with coverage limits customary for U.S. public companies similarly situated to Parent. In addition, Parent shall purchase, prior to the Effective Time, a six-year prepaid "tail policy" for the non-cancellable extension of the directors' and officers' liability coverage of Parent's existing directors' and officers' insurance policies for a claims reporting or discovery period of at least six years from and after the Effective Time with respect to any claim related to any period of time at or prior to the Effective Time (the "***D&O Tail Policy***").

(e) From and after the Effective Time, Parent shall pay all expenses, including reasonable attorneys' fees, that are incurred by the persons referred to in this Section 5.6 in connection with their successful enforcement of the rights provided to such persons in this Section 5.6.

(f) The provisions of this Section 5.6 are intended to be in addition to the rights otherwise available to the current and former officers and directors of Parent and the Company by Law, charter, statute, bylaw or agreement, and shall operate for the benefit of, and shall be enforceable by, each of the D&O Indemnified Parties, their heirs and their representatives.

(g) In the event Parent or the Surviving Corporation or any of their respective successors or assigns (i) consolidates with or merges into any other Person and shall not be the continuing or surviving corporation or entity of such consolidation or merger, or (ii) transfers all or substantially all of its properties and assets to any Person, then, and in each such case, proper provision shall be made so that the successors and assigns of Parent or the Surviving Corporation, as the case may be, shall succeed to the obligations set forth in this Section 5.6. Parent shall cause the Surviving Corporation to perform all of the obligations of the Surviving Corporation under this Section 5.6.

5.7 **Additional Agreements**. The Parties shall use commercially reasonable efforts to cause to be taken all actions necessary to consummate the Contemplated Transactions. Without limiting the generality of the foregoing, each Party to this Agreement: (a) shall make all filings and other submissions (if any) and give all notices (if any) required to be made and given by such Party in connection with the Contemplated Transactions; (b) shall use reasonable best efforts to obtain each Consent (if any) reasonably required to be obtained (pursuant to any applicable Law or Contract, or otherwise) by such Party in connection with the Contemplated Transactions or for such Contract (with respect to Contracts set forth in **Schedule 5.7**) to remain in full force and effect; (c) shall use commercially reasonable efforts to lift any injunction prohibiting, or any other legal bar to, the Contemplated Transactions; and (d) shall use commercially reasonable efforts to satisfy the conditions precedent to the consummation of this Agreement.

5.8 **Disclosure**. The initial press release relating to this Agreement shall be a joint press release issued by the Company and Parent and thereafter Parent and the Company shall consult with each other before issuing any further press release(s) or otherwise making any public statement or making any announcement to Parent Associates or Company Associates (to the extent not previously issued or made in accordance with this Agreement) with respect to the Contemplated Transactions and shall not issue any such press release, public statement or announcement to Parent Associates or Company Associates without the other Party's written consent (which shall not be unreasonably withheld, conditioned or delayed). Notwithstanding the foregoing: (a) each Party may, without such consultation or consent, make any public statement in response to questions from the press, analysts, investors or those attending industry conferences, make internal announcements to employees and make disclosures in Parent SEC Documents, so long as such statements are consistent with previous press releases, public disclosures or public statements made jointly by the parties (or individually, if approved by the other Party); (b) a Party may, without the prior consent of the other Party hereto but subject to giving advance notice to the other Party, issue any such press release or make any such public announcement or statement as may be required by any Law; and (c) Parent need not consult with the Company in connection with such portion of any press release, public statement or filing to be issued or made pursuant to Section 5.3(f) or with respect to any Acquisition Proposal or Parent Board Adverse Recommendation Change.

5.9 **Listing**. Parent shall use its commercially reasonable efforts, (a) to maintain its existing listing on Nasdaq until the Effective Time and to obtain approval of the listing of the combined corporation on Nasdaq, (b) to the extent required by the rules and regulations of Nasdaq, to prepare and submit to Nasdaq a notification form for the listing of the shares of Parent Common Stock to be issued in connection with the Contemplated Transactions, and to cause such shares to be approved for listing (subject to official notice of issuance); (c) to effect the Nasdaq Reverse Split; and (d) to the extent required by Nasdaq Marketplace Rule 5110, to file an initial listing application for the Parent Common Stock on Nasdaq (the "***Nasdaq Listing Application***") and to

cause such Nasdaq Listing Application to be conditionally approved prior to the Effective Time. The Parties will use commercially reasonable efforts to coordinate with respect to compliance with Nasdaq rules and regulations. Each Party will promptly inform the other Party of all verbal or written communications between Nasdaq and such Party or its representatives. Parent and the Company agree to evenly split all Nasdaq fees associated with the Nasdaq Listing Application and the Nasdaq Reverse Split, if any (the "***Nasdaq Fees***"). The Company will cooperate with Parent as reasonably requested by Parent with respect to the Nasdaq Listing Application and promptly furnish to Parent all information concerning the Company and its stockholders that may be required or reasonably requested in connection with any action contemplated by this Section 5.9.

5.10 **Tax Matters**.

(a) For United States federal income Tax purposes, (i) the Parties intend that the Merger qualify as a "reorganization" within the meaning of Section 368(a) of the Code (the "***Intended Tax Treatment***"), and (ii) this Agreement is intended to be, and is hereby adopted as, a "plan of reorganization" for purposes of Section 354 and 361 of the Code and Treasury Regulations Section 1.368-2(g) and 1.368-3(a), to which the Parent, Merger Sub and the Company are parties under Section 368(b) of the Code. The Parties shall treat and shall not take any tax reporting position inconsistent with the treatment of the Merger as a reorganization within the meaning of Section 368(a) of the Code for U.S. federal, state and other relevant Tax purposes, unless otherwise required pursuant to a "determination" within the meaning of Section 1313(a) of the Code.

(b) The Parties shall use their respective reasonable best efforts to cause the Merger to qualify, and will not take any action or cause any action to be taken which action would reasonably be expected to prevent the Merger from qualifying, for the Intended Tax Treatment.

(c) Each of the Parties shall use its reasonable best efforts to obtain (1) the Parent Registration Statement Tax Opinion, (2) the Company Registration Statement Tax Opinion, (3) the Parent Closing Tax Opinion and (4) the Company Closing Tax Opinion, including (i) delivering to Latham & Watkins LLP ("***Latham & Watkins***") and Cooley LLP ("***Cooley***") prior to the filing of the Registration Statement, tax representation letters substantially in the forms set forth in Section 5.10(c)(i) of the Company Disclosure Schedule and Section 5.10(c)(i) of the Parent Disclosure Schedule, respectively, and (ii) delivering to Latham & Watkins and Cooley, dated and executed as of the dates of such Tax opinions, tax representation letters in substantially the forms set forth in Section 5.10(c)(ii) of the Company Disclosure Schedule and Section 5.10(c)(ii) of the Parent Disclosure Schedule, respectively. Each of the Parties shall use its reasonable best efforts not to, and not permit any affiliate to, take or cause to be taken any action that would cause to be untrue (or fail to take or cause not to be taken any action which inaction would cause to be untrue) any of the representations and covenants made to counsel in the tax representation letters described in this Section.

5.11 **Legends**. Parent shall be entitled to place appropriate legends on the book entries and/or certificates evidencing any shares of Parent Common Stock to be received in the Merger by equity holders of the Company who may be considered "affiliates" of Parent for purposes of Rules 144 and 145 under the Securities Act reflecting the restrictions set forth in Rules 144 and 145 and to issue appropriate stop transfer instructions to the transfer agent for Parent Common Stock.

5.12 **Directors and Officers**.

(a) The Parties shall use reasonable best efforts and take all necessary action so that immediately after the Effective Time, (a) the Parent Board is comprised of nine members, with (i) two such members designated by Parent, (ii) two such members designated by Shanghai Pharmaceuticals USA, (iii) one member being the Chairman of the Company, (iv) one member being the Chief Executive Officer of the Company, and (v) the remaining three members being listed on **Exhibit C** under the heading "Additional Directors", (b) the Persons listed in **Exhibit C** under the heading "Officers" are elected or appointed, as applicable, to the positions of officers of Parent and the Surviving Corporation, as set forth therein, to serve in such positions effective as of

the Effective Time until successors are duly appointed and qualified in accordance with applicable Law and (c) Persons reasonably acceptable to Parent are elected or appointed, as applicable to the positions of officer of Parent set forth on **Exhibit C**. If any Person listed in **Exhibit C** is unable or unwilling to serve as an officer of Parent or the Surviving Corporation, as set forth therein, as of the Effective Time, the Parties shall mutually agree upon a successor. The Persons listed in **Exhibit C** under the heading "Board Designees – Parent" shall be Parent's designees pursuant to clause (a) of this Section 5.12 (which list may be changed by Parent at any time prior to the Closing by written notice to the Company to include different board designees who are reasonably acceptable to the Company) (the "***Parent Designees***"). The Persons listed in **Exhibit C** under the heading "Board Designees – Company" shall be the Company's designees pursuant to clause (a) of this Section 5.12 (which list may be changed by the Company at any time prior to the Closing by written notice to Parent to include different board designees who are reasonably acceptable to Parent).

(b) One of the Parent Designees shall be placed in the same class of Parent's current directors elected at Parent's 2019 annual meeting of stockholders, as identified on **Exhibit C**. After the Closing, the nominating committee of the Surviving Corporation shall nominate the Parent Designees for re-election in the first year in which the Parent Designees' term expires.

(c) For a period of three years after the Closing, J.R. Hyde, III will have the right to designate a Person to participate in the Parent Board meetings as an observer (the "***Board Observer***"); provided that (i) the obligations of Parent shall be subject to the Board Observer agreeing in writing to a customary confidentiality agreement with respect to information so provided, and (ii) Parent and the Parent Board may withhold any information from and exclude the Board Observer from any meeting or portion thereof to the extent access to such information or attendance at such meeting could adversely affect the attorney-client privilege between Parent and its counsel or result in disclosure of Parent's trade secrets or if such information or meeting involves a material conflict of interest with Parent and the Board Observer. The Person listed in **Exhibit C** under the heading "Board Observer" is designated as the Board Observer until J.R. Hyde, III appoints a successor.

5.13 **Termination of Certain Agreements and Rights**. The Company shall cause any Investor Agreements (excluding the Company Stockholder Support Agreements and Company Lock-up Agreements) to be terminated immediately prior to the Effective Time, without any liability being imposed on the part of Parent or the Surviving Corporation.

5.14 **Section 16 Matters**. Prior to the Effective Time, Parent and the Company shall take all such steps as may be required (to the extent permitted under applicable Laws) to cause any acquisitions of Parent Common Stock, restricted stock awards to acquire Parent Common Stock and any options to purchase Parent Common Stock in connection with the Contemplated Transactions, by each individual who is reasonably expected to become subject to the reporting requirements of Section 16(a) of the Exchange Act with respect to Parent, to be exempt under Rule 16b-3 promulgated under the Exchange Act.

5.15 **Cooperation**. Each Party shall cooperate reasonably with the other Party and shall provide the other Party with such assistance as may be reasonably requested for the purpose of facilitating the performance by each Party of its respective obligations under this Agreement and to enable the combined entity to continue to meet its obligations following the Effective Time.

5.16 **Allocation Certificates**.

(a) The Company will prepare and deliver to Parent at least five Business Days prior to the Closing Date a certificate signed by the Chief Financial Officer of the Company in a form reasonably acceptable to Parent setting forth (as of immediately prior to the Effective Time) (i) each holder of Company Common Stock, Company Options, and Company Warrants; (ii) such holder's name and address; (iii) the number and type of Company Common Stock held and/or underlying the Company Options, and Company Warrants as of the immediately prior to the Effective Time for each such holder; and (iv) the number of shares of Parent Common

Stock to be issued to such holder, or to underlie any Company Option or Company Warrant to be issued to such holder, pursuant to this Agreement in respect of the Company Common Stock, Company Options or Company Warrants held by such holder as of immediately prior to the Effective Time (the "***Allocation Certificate***").

(b) Parent will prepare and deliver to the Company at least five Business Days prior to the Closing Date a certificate signed by the Chief Financial Officer of Parent in a form reasonably acceptable to the Company, setting forth, as of immediately prior to the Effective Time (i) each record holder of Parent Common Stock, Parent Options, Parent Deferred Stock Rights, or Parent Warrants; (ii) such record holder's name and address; and (iii) the number of shares of Parent Common Stock held and/or underlying the Parent Options, Parent Deferred Stock Rights, or Parent Warrants as of the Effective Time for such holder (the "***Parent Outstanding Shares Certificate***").

5.17 **Company Financial Statements**. As promptly as reasonably practicable following the date of this Agreement (i) and no later than March 22, 2019 the Company will furnish to Parent audited financial statements for the fiscal years ended 2017 and 2018 for inclusion in the Proxy Statement and the Registration Statement (the "***Company Audited Financial Statements***") and (ii) the Company will furnish to Parent unaudited interim financial statements for each interim period completed prior to Closing that would be required to be included in the Registration Statement or any periodic report due prior to the Closing if the Company were subject to the periodic reporting requirements under the Securities Act or the Exchange Act (the "***Company Interim Financial Statements***"). Each of the Company Audited Financial Statements and the Company Interim Financial Statements will be suitable for inclusion in the Proxy Statement and the Registration Statement and prepared in accordance with GAAP as applied on a consistent basis during the periods involved (except in each case as described in the notes thereto) and on that basis will present fairly, in all material respects, the financial position and the results of operations, changes in stockholders' equity, and cash flows of the Company as of the dates of and for the periods referred to in the Company Audited Financial Statements or the Company Interim Financial Statements, as the case may be.

5.18 **Takeover Statutes**. If any Takeover Statute is or may become applicable to the Contemplated Transactions, each of the Company, the Company Board, Parent and the Parent Board, as applicable, shall grant such approvals and take such actions as are necessary so that the Contemplated Transactions may be consummated as promptly as practicable on the terms contemplated by this Agreement and otherwise act to eliminate or minimize the effects of such statute or regulation on the Contemplated Transactions.

5.19 **Stockholder Litigation**. Each Party shall keep the other Party reasonably informed regarding any stockholder litigation against any Party or any of its respective directors relating to or challenging this Agreement or the consummation of the Contemplated Transactions. Prior to the Closing, Parent shall reasonably consult with and permit the Company and its Representatives to participate in the defense, negotiations and settlement of any such stockholder litigation, and Parent shall give consideration to the Company's advice with respect to stockholder litigation. Parent shall promptly advise the Company orally and in writing of the initiation of, and shall keep the Company reasonably apprised of any material developments in connection with, any such stockholder litigation.

5.20 **Parent Equity Plan**.

(a) Prior to or as of the Effective Time, the Board of Directors and stockholders of Parent shall adopt the incentive award plan attached hereto as **Exhibit F** (the "***2019 Plan***") reserving for issuance 12% of the Parent Fully-Diluted Shares after giving effect to the Closing. The 2019 Plan will provide that the number of shares reserved for issuance thereunder will be increased annually on the first day of each year beginning in 2020 and ending in 2029, at the discretion of the Parent's Board of Directors, in an amount equal to the least of (a) five percent of the shares of Parent Common Stock outstanding (on an as-converted basis) on the last day of the immediately preceding year and (b) such smaller number of shares of stock as determined by the Parent's Board of Directors.

(b) Parent shall file with the SEC, promptly after the Effective Time, a registration statement on Form S-8 (or any successor form), if available for use by Parent, relating to the shares of Parent Common Stock issuable with respect to 2019 Plan.

5.21 **Preferred Stock Conversion.** The Company shall take all necessary action to effect the conversion of the Company Preferred Stock into Company Common Stock immediately prior to the Effect Time (the "***Preferred Stock Conversion***").

5.22 **Parent Options.**

(a) Prior to the Closing, the Parent Board shall have adopted appropriate resolutions and taken all other actions necessary and appropriate to provide that each unexpired and unexercised Parent Option, whether vested or unvested, shall be accelerated in full effective as of immediately prior to the Effective Time.

(b) Prior to the Closing, Parent shall take all actions that may be necessary (under the Parent Stock Plans and otherwise) to effectuate the provisions of this Section 5.22.

5.23 **Termination of Parent Deferred Stock Rights**. Prior to the Effective Time (but in no event more than 30 days prior to the Effective Time), Parent's Board of Directors or a duly authorized committee thereof shall, without any further action on the part of any holder thereof, take all actions necessary to cause the termination and liquidation of the Parent 2018 Amended and Restated Directors' Deferred Compensation Plan and all Parent Deferred Stock Rights or other deferrals thereunder effective immediately prior to the Effective Time, subject to the consummation of the Merger. Parent shall take all actions necessary to ensure that any deferrals under the Parent 2018 Amended and Restated Directors' Deferred Compensation Plan on or after January 3, 2019 shall be settled only in cash and that the maximum number of shares of Parent Common Stock issuable upon settlement of the Parent Deferred Share Units shall be limited to the number of Parent Deferred Share Units outstanding as of the date of this Agreement as set forth in Section 3.6(c).

Section 6. CONDITIONS PRECEDENT TO OBLIGATIONS OF EACH PARTY

The obligations of each Party to effect the Merger and otherwise consummate the Contemplated Transactions to be consummated at the Closing are subject to the satisfaction or, to the extent permitted by applicable Law, the written waiver by each of the Parties, at or prior to the Closing, of each of the following conditions:

6.1 **Effectiveness of Registration Statement**. The Registration Statement shall have become effective in accordance with the provisions of the Securities Act, and shall not be subject to any stop order or proceeding (or threatened proceeding by the SEC) seeking a stop order with respect to the Registration Statement that has not been withdrawn.

6.2 **No Restraints**. No temporary restraining order, preliminary or permanent injunction or other order preventing the consummation of the Contemplated Transactions shall have been issued by any court of competent jurisdiction or other Governmental Body of competent jurisdiction and remain in effect and there shall not be any Law which has the effect of making the consummation of the Contemplated Transactions illegal.

6.3 **Stockholder Approval**. (a) Parent shall have obtained the Required Parent Stockholder Vote and (b) the Company shall have obtained the Required Company Stockholder Vote.

6.4 **Listing**. The existing shares of Parent Common Stock shall have been continually listed on Nasdaq as of and from the date of this Agreement through the Closing Date, the approval of the listing of additional shares of Parent Common Stock on Nasdaq shall have been obtained and the shares of Parent Common Stock to be issued in the Merger pursuant to this Agreement shall have been approved for listing (subject to official notice of issuance) on Nasdaq as of the Closing.

6.5 **Regulatory Approvals**. All applicable waiting periods (and any extension thereof) applicable to the Merger under the HSR Act shall have expired or early termination of such waiting periods shall have been granted and all applicable foreign antitrust approvals shall have been obtained.

Section 7. ADDITIONAL CONDITIONS PRECEDENT TO OBLIGATIONS OF PARENT AND MERGER SUB

The obligations of Parent and Merger Sub to effect the Merger and otherwise consummate the transactions to be consummated at the Closing are subject to the satisfaction or the written waiver by Parent, at or prior to the Closing, of each of the following conditions:

7.1 **Accuracy of Representations**. The Company Fundamental Representations shall have been true and correct in all material respects as of the date of this Agreement and shall be true and correct in all material respects on and as of the Closing Date with the same force and effect as if made on and as of such date (except to the extent such representations and warranties are specifically made as of a particular date, in which case such representations and warranties shall be true and correct in all material respects as of such date). The representations and warranties of the Company contained in this Agreement (other than the Company Fundamental Representations) shall have been true and correct as of the date of this Agreement and shall be true and correct on and as of the Closing Date with the same force and effect as if made on the Closing Date, except (a) in each case, or in the aggregate, where the failure to be true and correct would not reasonably be expected to have a Company Material Adverse Effect (without giving effect to any references therein to any Company Material Adverse Effect or other materiality qualifications), or (b) for those representations and warranties which address matters only as of a particular date (which representations shall have been true and correct, subject to the qualifications as set forth in the preceding clause (a), as of such particular date) (it being understood that, for purposes of determining the accuracy of such representations and warranties, any update of or modification to the Company Disclosure Schedule made or purported to have been made after the date of this Agreement shall be disregarded).

7.2 **Performance of Covenants**. The Company shall have performed or complied with in all material respects all agreements and covenants required to be performed or complied with by it under this Agreement at or prior to the Effective Time.

7.3 **Documents**. Parent shall have received the following documents, each of which shall be in full force and effect:

(a) a certificate executed by the Chief Executive Officer or Chief Financial Officer of the Company certifying (i) that the conditions set forth in Sections 7.1, 7.2, 7.5, 7.6 and 7.9 have been duly satisfied and (ii) that the information set forth in the Allocation Certificate delivered by the Company in accordance with Section 5.16 is true and accurate in all respects as of the Closing Date; and

(b) the Allocation Certificate.

7.4 **FIRPTA Certificate**. Parent shall have received (i) an original signed statement from the Company that the Company is not, and has not been at any time during the applicable period specified in Section 897(c)(1)(A)(ii) of the Code, a "United States real property holding corporation," as defined in Section 897(c)(2) of the Code, conforming to the requirements of Treasury Regulations Section 1.1445-2(c)(3) and 1.897-2(h), and (ii) an original signed notice to be delivered to the IRS in accordance with the provisions of Treasury Regulations Section 1.897-2(h)(2), together with written authorization for Parent to deliver such notice to the IRS on behalf of the Company following the Closing, each dated as of the Closing Date, duly executed by an authorized officer of the Company, and in form and substance reasonably acceptable to Parent.

7.5 **No Company Material Adverse Effect**. Since the date of this Agreement, there shall not have occurred any Company Material Adverse Effect that is continuing.

7.6 **Termination of Investor Agreements**. The Investor Agreements shall have been terminated.

7.7 **Company Lock-Up Agreements**. Parent shall have received the Company Lock-Up Agreements duly executed by each of the Company Signatories, each stockholder of the Company expected to own more than ten percent (10%) of the outstanding Parent Common Stock after the Closing and each executive officer and director of the Company who is elected or appointed, as applicable, as an executive officer and director of Parent as of immediately following the Closing, each of which shall be in full force and effect.

7.8 **Company Stockholder Written Consent**. The Company Stockholder Written Consent evidencing the Required Company Stockholder Vote shall be in full force and effect.

7.9 **Preferred Stock Conversion**. The Company has effected the Preferred Stock Conversion.

7.10 **Parent Closing Tax Opinion**. Parent shall have received (i) the Parent Closing Tax Opinion and (ii) a copy of the Company Closing Tax Opinion.

Section 8. ADDITIONAL CONDITIONS PRECEDENT TO OBLIGATION OF THE COMPANY

The obligations of the Company to effect the Merger and otherwise consummate the transactions to be consummated at the Closing are subject to the satisfaction or the written waiver by the Company, at or prior to the Closing, of each of the following conditions:

8.1 **Accuracy of Representations**. The Parent Fundamental Representations shall have been true and correct in all material respects as of the date of this Agreement and shall be true and correct in all material respects on and as of the Closing Date with the same force and effect as if made on and as of such date (except to the extent such representations and warranties are specifically made as of a particular date, in which case such representations and warranties shall be true and correct in all material respects as of such date). The representations and warranties of Parent and Merger Sub contained in this Agreement (other than the Parent Fundamental Representations) shall have been true and correct as of the date of this Agreement and shall be true and correct on and as of the Closing Date with the same force and effect as if made on the Closing Date except (a) in each case, or in the aggregate, where the failure to be true and correct would not reasonably be expected to have a Parent Material Adverse Effect (without giving effect to any references therein to any Parent Material Adverse Effect or other materiality qualifications), or (b) for those representations and warranties which address matters only as of a particular date (which representations shall have been true and correct, subject to the qualifications as set forth in the preceding clause (a), as of such particular date) (it being understood that, for purposes of determining the accuracy of such representations and warranties, any update of or modification to the Parent Disclosure Schedule made or purported to have been made after the date of this Agreement shall be disregarded).

8.2 **Performance of Covenants**. Parent and Merger Sub shall have performed or complied with in all material respects all of their agreements and covenants required to be performed or complied with by each of them under this Agreement at or prior to the Effective Time.

8.3 **Documents**. The Company shall have received the following documents, each of which shall be in full force and effect:

(a) a certificate executed by the Chief Executive Officer or Chief Financial Officer of Parent confirming that the conditions set forth in Sections 8.1, 8.2, and 8.4 have been duly satisfied;

(b) the Parent Outstanding Shares Certificate; and

(c) a written resignation, in a form reasonably satisfactory to the Company, dated as of the Closing Date and effective as of the Closing, executed by each of the officers and directors of Parent who are not to continue as officers or directors of Parent after the Closing pursuant to Section 5.12 hereof.

8.4 **No Parent Material Adverse Effect**. Since the date of this Agreement, there shall not have occurred any Parent Material Adverse Effect.

8.5 **Parent Lock-Up Agreements**. The Company shall have received the Parent Lock-Up Agreements duly executed by each of the Parent Signatories, each of which shall be in full force and effect.

8.6 **Company Closing Tax Opinion**. The Company shall have received (i) the Company Closing Tax Opinion and (ii) a copy of the Parent Closing Tax Opinion.

8.7 **Board of Directors**. Parent shall have caused the Parent Board to be constituted as set forth in Section 5.12 of this Agreement effective as of the Effective Time.

Section 9. TERMINATION

9.1 **Termination**. This Agreement may be terminated prior to the Effective Time (whether before or after adoption of this Agreement by the Company's stockholders and whether before or after approval of the Parent Stockholder Matters by Parent's stockholders, unless otherwise specified below):

(a) by mutual written consent of Parent and the Company;

(b) by either Parent or the Company if the Contemplated Transactions shall not have been consummated by August 6, 2019 (subject to possible extension as provided in this Section 9.1(b), the "***End Date***"); *provided*, *however*, that the right to terminate this Agreement under this Section 9.1(b) shall not be available to the Company, on the one hand, or to Parent, on the other hand, if such Party's action or failure to act has been a principal cause of the failure of the Contemplated Transactions to occur on or before the End Date and such action or failure to act constitutes a breach of this Agreement, *provided*, *further*, *however*, that, in the event that a request for additional information has been made by any Governmental Body, or in the event that the SEC has not declared effective under the Exchange Act the Registration Statement by the date which is 60 days prior to the End Date, then either the Company or Parent shall be entitled to extend the End Date for an additional 60 days by written notice to the other the Party;

(c) by either Parent or the Company if a court of competent jurisdiction or other Governmental Body shall have issued a final and nonappealable order, decree or ruling, or shall have taken any other action, having the effect of permanently restraining, enjoining or otherwise prohibiting the Contemplated Transactions;

(d) by Parent if the Company Stockholder Written Consent evidencing the Required Company Stockholder Vote shall not have been obtained within the later of (i) 15 Business Days of the Registration Statement becoming effective in accordance with the provisions of the Securities Act and (ii) the date on which Parent obtains the Required Parent Stockholder Vote; *provided*, *however*, that once the Company Stockholder Written Consent evidencing the Required Company Stockholder Vote has been obtained, Parent may not terminate this Agreement pursuant to this Section 9.1(d);

(e) by either Parent or the Company if (i) the Parent Stockholders' Meeting (including any adjournments and postponements thereof) shall have been held and completed and Parent's stockholders shall have taken a final vote on the Parent Stockholder Matters and (ii) the Parent Stockholder Matters shall not have been approved at the Parent Stockholders' Meeting (or at any adjournment or postponement thereof) by the Required Parent Stockholder Vote *provided*, *however,* that the right to terminate this Agreement under this Section 9.1(e) shall not be available to Parent where the failure to obtain the Required Parent Stockholder Vote has been caused by the action or failure to act of Parent or Merger Sub and such action or failure to act constitutes a material breach by Parent or Merger Sub of this Agreement;

(f) by the Company (at any time prior to the approval of the Parent Stockholder Matters by the Required Parent Stockholder Vote) if a Parent Triggering Event shall have occurred;

(g) by Parent (at any time prior to the Required Company Stockholder Vote being obtained) if a Company Triggering Event shall have occurred;

(h) by the Company, upon a breach of any representation, warranty, covenant or agreement set forth in this Agreement by Parent or Merger Sub or if any representation or warranty of Parent or Merger Sub shall have become inaccurate, in either case, such that the conditions set forth in Section 8.1 or Section 8.2 would not be satisfied as of the time of such breach or as of the time such representation or warranty shall have become inaccurate; *provided* that the Company is not then in material breach of any representation, warranty, covenant or agreement under this Agreement; *provided*, *further*, that if such inaccuracy in Parent's or Merger Sub's representations and warranties or breach by Parent or Merger Sub is curable by the End Date by Parent or Merger Sub, then this Agreement shall not terminate pursuant to this Section 9.1(h) as a result of such particular breach or inaccuracy until the expiration of a 15-day period commencing upon delivery of written notice from the Company to Parent or Merger Sub of such breach or inaccuracy and its intention to terminate pursuant to this Section 9.1(h) (it being understood that this Agreement shall not terminate pursuant to this Section 9.1(h) as a result of such particular breach or inaccuracy if such breach by Parent or Merger Sub is cured prior to such termination becoming effective); or

(i) by Parent, upon a breach of any representation, warranty, covenant or agreement set forth in this Agreement by the Company or if any representation or warranty of the Company shall have become inaccurate, in either case, such that the conditions set forth in Section 7.1 or Section 7.2 would not be satisfied as of the time of such breach or as of the time such representation or warranty shall have become inaccurate; *provided* that Parent is not then in material breach of any representation, warranty, covenant or agreement under this Agreement; *provided*, *further*, that if such inaccuracy in the Company's representations and warranties or breach by the Company is curable by the End Date by the Company then this Agreement shall not terminate pursuant to this Section 9.1(i) as a result of such particular breach or inaccuracy until the expiration of a 15-day period commencing upon delivery of written notice from Parent to the Company of such breach or inaccuracy and its intention to terminate pursuant to this Section 9.1(i) (it being understood that this Agreement shall not terminate pursuant to this Section 9.1(i) as a result of such particular breach or inaccuracy if such breach by the Company is cured prior to such termination becoming effective).

9.2 **Effect of Termination**. In the event of the termination of this Agreement as provided in Section 9.1, this Agreement shall be of no further force or effect; *provided*, *however*, that (a) this Section 9.2, Section 5.8, Section 9.3, Section 10 and the definitions of the defined terms in such Sections shall survive the termination of this Agreement and shall remain in full force and effect, (b) the termination of this Agreement and the provisions of Section 9.3 shall not relieve any Party of any liability for fraud or for any willful and material breach of any representation, warranty, covenant, obligation or other provision contained in this Agreement, and (c) in the event this Agreement is terminated (i) by the Company pursuant to Section 9.1(h), then Parent shall pay to the Company an amount equal to $500,000 within five Business Days of terminating this Agreement, (ii) by Parent pursuant to Section 9.1(i), then the Company shall pay to Parent an amount equal to $500,000 within five Business Days of terminating this Agreement.

9.3 **Expenses; Termination Fees**.

(a) Except as set forth in this Section 9.3, whether or not the Merger is consummated, (i) all Parent Transaction Expenses shall be paid by Parent (or on behalf of Parent) at or prior to the Closing and (ii) all Company Transaction Expenses shall be paid by the Company.

(b) If (i) this Agreement is terminated by the Company pursuant to Section 9.1(f), and (ii) an Acquisition Proposal with respect to Parent shall have been publicly announced or disclosed or otherwise communicated to Parent or the Parent Board after the date of this Agreement but prior to the termination of this Agreement, and (iii) within 12 months after the date of such termination, Parent enters into a definitive agreement with respect to any Subsequent Transaction, then Parent shall pay to the Company an amount equal to

$1,000,000 within five Business Days of such entry into a definitive agreement with respect to a Subsequent Transaction.

(c) If (i) this Agreement is terminated by Parent pursuant to Section 9.1(g), and (ii) an Acquisition Proposal with respect to the Company shall have been publicly announced or disclosed or otherwise communicated to the Company or the Company Board after the date of this Agreement but prior to the termination of this Agreement, and (iii) within 12 months after the date of such termination, the Company enters into a definitive agreement with respect to any Subsequent Transaction, then the Company shall pay to Parent an amount equal to $1,000,000 within five Business Days of such entry into a definitive agreement with respect to a Subsequent Transaction.

(d) If this Agreement is terminated (i) by Parent pursuant to Section 9.1(d), or (ii) by the Company pursuant to Section 9.1(b) and the Company Stockholder Written Consent evidencing the Required Company Stockholder Vote has not been obtained by the Company, then the Company shall pay to Parent within five Business Days of such termination an amount equal to $2,000,000.

(e) If (i) this Agreement is terminated by either Parent or the Company pursuant to Section 9.1(e), or (ii) by Parent pursuant to Section 9.1(b) and the Required Parent Stockholder Vote has not been obtained by Parent, then Parent shall pay to the Company within five Business Days of such termination an amount equal to $2,000,000

(f) Any fee payable by the Company or Parent under Section 9.2 or this Section 9.3 shall be paid by wire transfer of same day funds. If a Party fails to pay when due any amount payable by it under Section 9.2 or this Section 9.3, then such Party shall pay to the other Party interest on such overdue amount (for the period commencing as of the date such overdue amount was originally required to be paid and ending on the date such overdue amount is actually paid to the other Party in full) at a rate per annum equal to the "prime rate" (as published in *The Wall Street Journal* or any successor thereto) in effect on the date such overdue amount was originally required to be paid.

(g) The Parties agree that, (i) subject to Section 9.2, any fee payable by Parent to the Company under this Section 9.3, in the circumstances in which it is owed in accordance with the terms of this Agreement, constitute the sole and exclusive remedy of the Company following the termination of this Agreement under the circumstances described in this Section 9.3, it being understood that in no event shall Parent be required to pay the amounts payable pursuant to this Section 9.3 on more than one occasion and (ii) following payment of any fee payable by Parent to the Company under this Section 9.3 (A) Parent shall have no further liability to the Company in connection with or arising out of this Agreement or the termination thereof, any breach of this Agreement by Parent giving rise to such termination, or the failure of the Contemplated Transactions to be consummated, (B) neither the Company nor any of its Affiliates shall be entitled to bring or maintain any other claim, action or proceeding against Parent or Merger Sub or seek to obtain any recovery, judgment or damages of any kind against such Parties (or any partner, member, stockholder, director, officer, employee, Subsidiary, Affiliate, agent or other Representative of such Parties) in connection with or arising out of this Agreement or the termination thereof, any breach by any such Parties giving rise to such termination or the failure of the Contemplated Transactions to be consummated and (C) the Company and its Affiliates shall be precluded from any other remedy against Parent, Merger Sub and their respective Affiliates, at law or in equity or otherwise, in connection with or arising out of this Agreement or the termination thereof, any breach by such Party giving rise to such termination or the failure of the Contemplated Transactions to be consummated; *provided*, *however*, that nothing in this Section 9.3(g) shall limit the rights of Parent and Merger Sub under Section 10.11.

(h) The Parties agree that, (i) subject to Section 9.2, any fee payable by the Company to Parent under this Section 9.3 shall, in the circumstances in which it is owed in accordance with the terms of this Agreement, constitute the sole and exclusive remedy of Parent following the termination of this Agreement under the circumstances described in this Section 9.3, it being understood that in no event shall the Company be

required to pay the amounts payable pursuant to this Section 9.3 on more than one occasion and (ii) following payment of any fee payable by the Company to Parent under this Section 9.3 (A) the Company shall have no further liability to Parent in connection with or arising out of this Agreement or the termination thereof, any breach of this Agreement by the Company giving rise to such termination, or the failure of the Contemplated Transactions to be consummated, (B) neither Parent nor any of its Affiliates shall be entitled to bring or maintain any other claim, action or proceeding against the Company or seek to obtain any recovery, judgment or damages of any kind against such Parties (or any partner, member, stockholder, director, officer, employee, Subsidiary, Affiliate, agent or other Representative of such Parties) in connection with or arising out of this Agreement or the termination thereof, any breach by any such Parties giving rise to such termination or the failure of the Contemplated Transactions to be consummated and (C) Parent and its Affiliates shall be precluded from any other remedy against the Company and its Affiliates, at law or in equity or otherwise, in connection with or arising out of this Agreement or the termination thereof, any breach by such Party giving rise to such termination or the failure of the Contemplated Transactions to be consummated; *provided*, *however*, that nothing in this Section 9.3(h) shall limit the rights of the Company under Section 10.11.

(i) Each of the Parties acknowledges that (i) the agreements contained in this Section 9.3 are an integral part of the Contemplated Transactions, (ii) without these agreements, the Parties would not enter into this Agreement and (iii) any amount payable pursuant to this Section 9.3 is not a penalty, but rather is liquidated damages in a reasonable amount that will compensate the Company in the circumstances in which such amount is payable.

Section 10. MISCELLANEOUS PROVISIONS

10.1 **Non-Survival of Representations and Warranties**. The representations and warranties of the Company, Parent and Merger Sub contained in this Agreement or any certificate or instrument delivered pursuant to this Agreement shall terminate at the Effective Time, and only the covenants that by their terms survive the Effective Time and this Section 10 shall survive the Effective Time.

10.2 **Amendment**. This Agreement may be amended with the approval of the respective boards of directors of the Company, Merger Sub and Parent at any time (whether before or after the adoption and approval of this Agreement by the Company's stockholders or before or after obtaining the Required Parent Stockholder Vote); *provided*, *however*, that after any such approval of this Agreement by a Party's stockholders, no amendment shall be made which by Law requires further approval of such stockholders without the further approval of such stockholders. This Agreement may not be amended except by an instrument in writing signed on behalf of each of the Company, Merger Sub and Parent.

10.3 **Waiver**.

(a) No failure on the part of any Party to exercise any power, right, privilege or remedy under this Agreement, and no delay on the part of any Party in exercising any power, right, privilege or remedy under this Agreement, shall operate as a waiver of such power, right, privilege or remedy; and no single or partial exercise of any such power, right, privilege or remedy shall preclude any other or further exercise thereof or of any other power, right, privilege or remedy.

(b) No Party shall be deemed to have waived any claim arising out of this Agreement, or any power, right, privilege or remedy under this Agreement, unless the waiver of such claim, power, right, privilege or remedy is expressly set forth in a written instrument duly executed and delivered on behalf of such Party and any such waiver shall not be applicable or have any effect except in the specific instance in which it is given.

10.4 **Entire Agreement; Counterparts; Exchanges by Electronic Transmission**. This Agreement and the other agreements referred to in this Agreement constitute the entire agreement and supersede all prior agreements and understandings, both written and oral, among or between any of the Parties with respect to the

subject matter hereof and thereof; *provided*, *however*, that the Confidentiality Agreement shall not be superseded and shall remain in full force and effect in accordance with its terms. This Agreement may be executed in several counterparts, each of which shall be deemed an original and all of which shall constitute one and the same instrument. The exchange of a fully executed Agreement (in counterparts or otherwise) by all Parties by electronic transmission in .PDF format shall be sufficient to bind the Parties to the terms and conditions of this Agreement.

10.5 **Applicable Law; Jurisdiction**. This Agreement shall be governed by, and construed in accordance with, the Laws of the State of Delaware, regardless of the Laws that might otherwise govern under applicable principles of conflicts of laws. In any action or proceeding between any of the Parties arising out of or relating to this Agreement or any of the Contemplated Transactions, each of the Parties: (a) irrevocably and unconditionally consents and submits to the exclusive jurisdiction and venue of the Court of Chancery of the State of Delaware or, to the extent such court does not have subject matter jurisdiction, the United States District Court for the District of Delaware or, to the extent that neither of the foregoing courts has jurisdiction, the Superior Court of the State of Delaware; (b) agrees that all claims in respect of such action or proceeding shall be heard and determined exclusively in accordance with clause (a) of this Section 10.5; (c) waives any objection to laying venue in any such action or proceeding in such courts; (d) waives any objection that such courts are an inconvenient forum or do not have jurisdiction over any Party; (e) agrees that service of process upon such Party in any such action or proceeding shall be effective if notice is given in accordance with Section 10.8 of this Agreement; and (f) irrevocably and unconditionally waives the right to trial by jury.

10.6 **Attorneys' Fees**. In any action at law or suit in equity to enforce this Agreement or the rights of any of the Parties, the prevailing Party in such action or suit (as determined by a court of competent jurisdiction) shall be entitled to recover its reasonable out-of-pocket attorneys' fees and all other reasonable costs and expenses incurred in such action or suit.

10.7 **Assignability**. This Agreement shall be binding upon, and shall be enforceable by and inure solely to the benefit of, the Parties and their respective successors and permitted assigns; *provided*, *however*, that neither this Agreement nor any of a Party's rights or obligations hereunder may be assigned or delegated by such Party without the prior written consent of the other Party, and any attempted assignment or delegation of this Agreement or any of such rights or obligations by such Party without the other Party's prior written consent shall be void and of no effect.

10.8 **Notices**. All notices and other communications hereunder shall be in writing and shall be deemed to have been duly delivered and received hereunder (a) one Business Day after being sent for next Business Day delivery, fees prepaid, via a reputable international overnight courier service, (b) upon delivery in the case of delivery by hand, or (c) on the date delivered in the place of delivery if sent by email (with a written or electronic confirmation of delivery) prior to 5:00 p.m. Central time, otherwise on the next succeeding Business Day, in each case to the intended recipient as set forth below:

if to Parent or Merger Sub:

GTx, Inc.
175 Toyota Plaza, 7th Floor
Memphis, TN 38103
Attention: Marc S. Hanover; Henry P. Doggrell
Email: mhanover@gtxinc.com; hdoggrell@gtxinc.com

with a copy to (which shall not constitute notice):

Cooley LLP
101 California Street, 5th Floor
San Francisco, CA 94111-5800
Attention: Chadwick Mills, Laura Medina, Kassendra Galindo
Email: cmills@cooley.com, lmedina@cooley.com, kgalindo@cooley.com

if to the Company:

Oncternal Therapeutics, Inc.
3525 Del Mar heights Rd., #821
San Diego, CA 92130
Attention: James Breitmeyer, President & CEO
Email: jbreitmeyer@oncternal.com

with a copy to (which shall not constitute notice):

Latham & Watkins LLP
12670 High Bluff Drive
San Diego, CA 92130
Attention: Cheston J. Larson
Email: cheston.larson@lw.com

10.9 **Cooperation**. Each Party agrees to cooperate fully with the other Party and to execute and deliver such further documents, certificates, agreements and instruments and to take such other actions as may be reasonably requested by the other Party to evidence or reflect the Contemplated Transactions and to carry out the intent and purposes of this Agreement.

10.10 **Severability**. Any term or provision of this Agreement that is invalid or unenforceable in any situation in any jurisdiction shall not affect the validity or enforceability of the remaining terms and provisions of this Agreement or the validity or enforceability of the offending term or provision in any other situation or in any other jurisdiction. If a final judgment of a court of competent jurisdiction declares that any term or provision of this Agreement is invalid or unenforceable, the Parties agree that the court making such determination shall have the power to limit such term or provision, to delete specific words or phrases or to replace such term or provision with a term or provision that is valid and enforceable and that comes closest to expressing the intention of the invalid or unenforceable term or provision, and this Agreement shall be valid and enforceable as so modified. In the event such court does not exercise the power granted to it in the prior sentence, the Parties agree to replace such invalid or unenforceable term or provision with a valid and enforceable term or provision that will achieve, to the extent possible, the economic, business and other purposes of such invalid or unenforceable term or provision.

10.11 **Other Remedies; Specific Performance**. Except as otherwise provided herein, any and all remedies herein expressly conferred upon a Party will be deemed cumulative with and not exclusive of any other remedy conferred hereby, or by law or equity upon such Party, and the exercise by a Party of any one remedy will not preclude the exercise of any other remedy. The Parties agree that irreparable damage for which monetary damages, even if available, would not be an adequate remedy, would occur in the event that any Party does not perform the provisions of this Agreement (including failing to take such actions as are required of it hereunder to consummate this Agreement) in accordance with its specified terms or otherwise breaches such provisions. Accordingly, the Parties acknowledge and agree that the Parties shall be entitled to an injunction, specific performance and other equitable relief to prevent breaches of this Agreement and to enforce specifically the terms and provisions hereof, in addition to any other remedy to which they are entitled at law or in equity. Each of the Parties agrees that it will not oppose the granting of an injunction, specific performance or other equitable relief on the basis that any other Party has an adequate remedy at law or that any award of specific performance is not an appropriate remedy for any reason at law or in equity. Any Party seeking an injunction or injunctions to prevent breaches of this Agreement shall not be required to provide any bond or other security in connection with any such order or injunction.

10.12 **No Third Party Beneficiaries**. Nothing in this Agreement, express or implied, is intended to or shall confer upon any Person (other than the Parties and the D&O Indemnified Parties to the extent of their respective rights pursuant to Section 5.6) any right, benefit or remedy of any nature whatsoever under or by reason of this Agreement.

10.13 **Construction**.

(a) References to “cash,” “dollars” or “$” are to U.S. dollars.

(b) For purposes of this Agreement, whenever the context requires: the singular number shall include the plural, and vice versa; the masculine gender shall include the feminine and neuter genders; the feminine gender shall include the masculine and neuter genders; and the neuter gender shall include masculine and feminine genders.

(c) The Parties have participated jointly in the negotiating and drafting of this Agreement and agree that any rule of construction to the effect that ambiguities are to be resolved against the drafting Party shall not be applied in the construction or interpretation of this Agreement, and no presumption or burden of proof shall arise favoring or disfavoring any Party by virtue of the authorship of any provision of this Agreement.

(d) As used in this Agreement, the words “include” and “including,” and variations thereof, shall not be deemed to be terms of limitation, but rather shall be deemed to be followed by the words “without limitation.”

(e) Except as otherwise indicated, all references in this Agreement to “Sections,” “Exhibits” and “Schedules” are intended to refer to Sections of this Agreement and Exhibits and Schedules to this Agreement, respectively.

(f) Any reference to legislation or to any provision of any legislation shall include any modification, amendment, re-enactment thereof, any legislative provision substituted therefore and all rules, regulations, and statutory instruments issued or related to such legislations.

(g) The bold-faced headings and table of contents contained in this Agreement are for convenience of reference only, shall not be deemed to be a part of this Agreement and shall not be referred to in connection with the construction or interpretation of this Agreement.

(h) The Parties agree that each of the Company Disclosure Schedule and the Parent Disclosure Schedule shall be arranged in sections and subsections corresponding to the numbered and lettered sections and subsections contained in this Agreement. The disclosures in any section or subsection of the Company Disclosure Schedule or the Parent Disclosure Schedule shall qualify other sections and subsections in this Agreement to the extent it is readily apparent on its face from a reading of the disclosure that such disclosure is applicable to such other sections and subsections.

(i) Each of “delivered” or “made available” means, with respect to any documentation, that prior to 11:59 p.m. (Central time) on the date that is two Business Days prior to the date of this Agreement (i) a copy of such material has been posted to and made available by a Party to the other Party and its Representatives in the electronic data room maintained by such disclosing Party or (ii) such material is disclosed in the Parent SEC Documents filed with the SEC prior to the date hereof and publicly made available on the SEC’s Electronic Data Gathering Analysis and Retrieval system.

(j) Whenever the last day for the exercise of any privilege or the discharge of any duty hereunder shall fall upon a Saturday, Sunday, or any date on which banks in New York, New York are authorized or obligated by Law to be closed, the Party having such privilege or duty may exercise such privilege or discharge such duty on the next succeeding day which is a regular Business Day.

(*Remainder of page intentionally left blank*)

IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed as of the date first above written.

GTX, INC.

By: */s/ Marc Hannover*
Name: Marc Hanover
Title: Chief Executive Officer

IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed as of the date first above written.

GRIZZLY MERGER SUB, INC.

By: */s/ Henry Doggrell*
Name: Henry Doggrell
Title: Chief Executive Officer

IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed as of the date first above written.

ONCTERNAL THERAPEUTICS, INC.

By: */s/ James Breitmeyer*
Name: James Breitmeyer
Title: President and Chief Executive Officer

EXHIBIT A

CERTAIN DEFINITIONS

(a) For purposes of this Agreement (including this Exhibit A):

"***Acquisition Inquiry***" means, with respect to a Party, an inquiry, indication of interest or request for information (other than an inquiry, indication of interest or request for information made or submitted by the Company, on the one hand, or Parent, on the other hand, to the other Party) that would reasonably be expected to lead to an Acquisition Proposal.

"***Acquisition Proposal***" means, with respect to a Party, any offer or proposal, whether written or oral (other than an offer or proposal made or submitted by or on behalf of the Company or any of its Affiliates, on the one hand, or by or on behalf of Parent or any of its Affiliates, on the other hand, to the other Party) contemplating or otherwise relating to any Acquisition Transaction with such Party.

"***Acquisition Transaction***" means any transaction or series of related transactions involving:

(i) any merger, consolidation, amalgamation, share exchange, business combination, issuance of securities, acquisition of securities, reorganization, recapitalization, tender offer, exchange offer or other similar transaction: (i) in which a Party is a constituent entity; (ii) in which a Person or "group" (as defined in the Exchange Act and the rules promulgated thereunder) of Persons directly or indirectly acquires beneficial or record ownership of securities representing more than 20% of the outstanding securities of any class of voting securities of a Party or any of its Subsidiaries; or (iii) in which a Party or any of its Subsidiaries issues securities representing more than 20% of the outstanding securities of any class of voting securities of such Party or any of its Subsidiaries; or

(ii) any sale, lease, exchange, transfer, license, acquisition or disposition of any business or businesses or assets that constitute or account for 20% or more of the consolidated book value or the fair market value of the assets of a Party and its Subsidiaries, taken as a whole.

"***Affiliate***" of a Person means any other Person that directly or indirectly, through one or more intermediaries, controls, is controlled by, or is under common control with, such Person. The term "control" (including the terms "controlled by" and "under common control with") means the possession, directly or indirectly, of the power to direct or cause the direction of the management and policies of a Person, whether through the ownership of voting securities, by contract or otherwise.

"***Agreement***" means the Agreement and Plan of Merger and Reorganization to which this **Exhibit A** is attached, as it may be amended from time to time.

"***Business Day***" means any day other than a Saturday, Sunday or other day on which banks in New York, New York are authorized or obligated by Law to be closed.

"***Cash and Cash Equivalents***" means all (a) cash and cash equivalents (excluding Restricted Cash) and (b) marketable securities, in each case determined in accordance with GAAP, consistently applied.

"***CCC***" means the California Corporations Code, as amended.

"***Code***" means the Internal Revenue Code of 1986, as amended.

"***Combined Transaction Expenses***" means legal expenses incurred by the Company in preparing the Registration Statement, Proxy Statement, and any amendments and supplements thereto, preparing responses to any SEC comments, and drafting any charter amendments and the Amended Plan (and in each case, the related

disclosure required in the Registration Statement and Proxy Statement) and preparing such other transaction documents in connection with the Contemplated Transaction as Cooley and Latham & Watkins agree shall be produced by Latham & Watkins, which amount shall not exceed $250,000 in the aggregate, and in each case, shall be evidenced by an invoice delivered by the Company to Parent no later than seven Business Days prior to Closing.

"***Company Affiliate***" means any Person that is (or at any relevant time was) under common control with the Company within the meaning of Sections 414(b), (c), (m) and (o) of the Code, and the regulations issued thereunder.

"***Company Associate***" means any current or former employee, independent contractor, officer or director of the Company.

"***Company Board***" means the board of directors of the Company.

"***Company Capital Stock***" means the Company Common Stock and the Company Preferred Stock.

"***Company Cash Amount***" means the Cash and Cash Equivalents of the Company as of the Determination Date, as calculated in accordance with Section 1.13.

"***Company Change in Circumstance***" means a change in circumstances (other than an Acquisition Proposal) that affects the business, assets or operations of the Company that occurs or arises after the date of this Agreement.

"***Company Closing Tax Opinion***" means a written opinion from Latham & Watkins, dated as of the Closing Date, based on the facts, representations, assumptions and exclusions set forth or described in such opinion, and substantially in the form set forth in Section 5.10(c)(4) of the Company Disclosure Schedule, to the effect that the Merger will qualify for the Intended Tax Treatment. In rendering such opinion, Latham & Watkins shall be entitled to rely upon customary assumptions, representations, warranties and covenants reasonably satisfactory to it, including representations set forth in certificates of officers of Parent and the Company, in substantially the forms set forth in Section 5.10(c)(ii) of the Parent Disclosure Schedule and Section 5.10(c)(ii) of the Company Disclosure Schedule.

"***Company Common Stock***" means the Common Stock, $0.0001 par value per share, of the Company.

"***Company Contract***" means any Contract: (a) to which the Company or any of its Subsidiaries is a Party; (b) by which the Company or any of its Subsidiaries or any Company IP or any other asset of the Company or its Subsidiaries is or may become bound or under which the Company or any of its Subsidiaries has, or may become subject to, any obligation; or (c) under which the Company or any of its Subsidiaries has or may acquire any right or interest.

"***Company ERISA Affiliate***" means any corporation or trade or business (whether or not incorporated) which is (or at any relevant time was) treated with the Company or any of its Subsidiaries as a single employer within the meaning of Section 414 of the Code.

"***Company Fundamental Representations***" means the representations and warranties of the Company set forth in Sections 2.1 (Due Organization; Subsidiaries), 2.3 (Authority; Binding Nature of Agreement), 2.6(a) and (c) (Capitalization) and 2.20 (No Financial Advisors).

"***Company IP***" means all Intellectual Property Rights that are owned or purported to be owned by, assigned to, or licensed by, the Company or its Subsidiaries.

"***Company Material Adverse Effect***" means any Effect that, considered together with all other Effects that have occurred prior to the date of determination of the occurrence of a Company Material Adverse Effect, has or would reasonably be expected to have a material adverse effect on the business, financial condition, assets, liabilities or results of operations of the Company or its Subsidiaries, taken as a whole; *provided*, *however*, that Effects arising or resulting from the following shall not be taken into account in determining whether there has been a Company Material Adverse Effect: (a) general business, economic or political conditions affecting the industry in which the Company and its Subsidiaries operate, (b) any natural disaster or any acts of war, armed hostilities or terrorism, (c) changes in financial, banking or securities markets, (d) the failure of the Company to meet internal or analysts' expectations or projections or the results of operations of the Company, (e) any clinical trial programs or studies, including any adverse data, event or outcome arising out of or relating to any such programs or studies, (f) any change in, or any compliance with or action taken for the purpose of complying with, any Law or GAAP (or interpretations of any Law or GAAP), (g) resulting from the announcement of this Agreement or the pendency of the Contemplated Transactions, or (h) resulting from the taking of any action, or the failure to take any action, by the Company that is required to be taken by this Agreement; except in each case with respect to clauses (a) through (c), to the extent disproportionately affecting the Company and its Subsidiaries, taken as a whole, relative to other similarly situated companies in the industries in which the Company and its Subsidiaries operate.

"***Company Options***" means options or other rights to purchase shares of Company Common Stock issued by the Company.

"***Company Plans***" means the Oncternal Therapeutics, Inc. 2016 Equity Incentive Plan and the Oncternal Therapeutics, Inc. 2015 Equity Incentive Plan.

"***Company Registration Statement Tax Opinion***" means a written opinion from Latham & Watkins, dated as of such date as may be required by the SEC in connection with the filing of the Registration Statement, based on the facts, representations, assumptions and exclusions set forth or described in such opinion, and substantially in the form set forth in Section 5.10(c)(2) of the Company Disclosure Schedule, to the effect that the Merger will qualify for the Intended Tax Treatment. In rendering such opinion, Latham & Watkins shall be entitled to rely upon customary assumptions, representations, warranties and covenants reasonably satisfactory to it, including representations set forth in certificates of officers of Parent and the Company, in substantially the forms set forth in Section 5.10(c)(i) of the Parent Disclosure Schedule and Section 5.10(c)(i) of the Company Disclosure Schedule.

"***Company Target***" means $10,500,000.

"***Company Transaction Expenses***" means all fees and expenses incurred by the Company at or prior to the Effective Time in connection with the Contemplated Transactions and this Agreement, including (a) any fees and expenses of legal counsel and accountants, the maximum amount of fees and expenses payable to financial advisors, investment bankers, brokers, consultants, and other advisors of the Company (other than the Combined Transaction Expenses); and (b) 50% of (i) the fees paid to the SEC in connection with filing the Registration Statement, the Proxy Statement, and any amendments and supplements thereto with the SEC; (ii) the Nasdaq Fees; (iii) the fees and expenses paid or payable to the Exchange Agent pursuant to the engagement agreement with the Exchange Agent; and (iv) any fees and expenses incurred Toppan Merrill, Broadridge or the proxy solicitor in connection with the filing and distribution of the Registration Statement and any amendments and supplements thereto with the SEC (without duplication of the fees and expenses addressed in clause (b)(i) above).

"***Company Triggering Event***" shall be deemed to have occurred if: (a) the Company shall have made a Company Board Adverse Recommendation Change; (b) the Company Board or any committee thereof shall have publicly approved, endorsed or recommended any Acquisition Proposal; (c) the Company shall have entered into any letter of intent or similar document relating to any Acquisition Proposal; or (d) the Company, or any director or officer of the Company, shall have willfully and intentionally breached the provisions set forth in Section 4.5.

"***Company Unaudited Interim Balance Sheet***" means the unaudited consolidated balance sheet of the Company and its consolidated Subsidiaries for the period ended September 30, 2018 provided to Parent prior to the date of this Agreement.

"***Company Warrant***" means the warrants to purchase capital stock of the Company listed on Section B of the Company Disclosure Schedule.

"***Confidentiality Agreement***" means the Non-Disclosure Agreement, dated as of November 30, 2018, between the Company and Parent.

"***Consent***" means any approval, consent, ratification, permission, waiver or authorization (including any Governmental Authorization).

"***Consideration***" means (a) the Exchange Ratio used to determine the number of shares of Parent Common Stock to be issued to the holders of Company Common Stock as contemplated by Section 1.5 of this Agreement and the number of Parent Options and Parent Warrants to be substituted for the Company Options and Company Warrants to be assumed by Parent as contemplated by Section 5.5 and (b) the right of the holders of Parent Common Stock as of immediately prior to the Effective Time (the "***CVR Holders***") to receive contingent cash payments pursuant to the CVR Agreement.

"***Contemplated Transactions***" means the Merger, the Preferred Stock Conversion and the other transactions and actions contemplated by this Agreement, including the Nasdaq Reverse Split and the CVR Agreement.

"***Contract***" means, with respect to any Person, any written or oral agreement, contract, subcontract, lease (whether for real or personal property), mortgage, license, sublicense or other legally binding commitment or undertaking of any nature to which such Person is a party or by which such Person or any of its assets are bound or affected under applicable Law.

"***DGCL***" means the General Corporation Law of the State of Delaware.

"***Effect***" means any effect, change, event, circumstance, or development.

"***Encumbrance***" means any lien, pledge, hypothecation, charge, mortgage, security interest, lease, license, option, easement, reservation, servitude, adverse title, claim, infringement, interference, option, right of first refusal, preemptive right, community property interest or restriction or encumbrance of any nature (including any restriction on the voting of any security, any restriction on the transfer of any security or other asset, any restriction on the receipt of any income derived from any asset, any restriction on the use of any asset and any restriction on the possession, exercise or transfer of any other attribute of ownership of any asset).

"Enforceability Exceptions" means the (a) Laws of general application relating to bankruptcy, insolvency and the relief of debtors; and (b) rules of law governing specific performance, injunctive relief and other equitable remedies.

"***Entity***" means any corporation (including any non-profit corporation), partnership (including any general partnership, limited partnership or limited liability partnership), joint venture, estate, trust, company (including any company limited by shares, limited liability company or joint stock company), firm, society or other enterprise, association, organization or entity, and each of its successors.

"***Environmental Law***" means any federal, state, local or foreign Law relating to pollution or protection of human health or the environment (including ambient air, surface water, ground water, land surface or subsurface strata), including any Law or regulation relating to emissions, discharges, releases or threatened releases of Hazardous Materials, or otherwise relating to the manufacture, processing, distribution, use, treatment, storage, disposal, transport or handling of Hazardous Materials.

"***ERISA***" means the Employee Retirement Income Security Act of 1974, as amended.

"***Exchange Act***" means the Securities Exchange Act of 1934.

"***Exchange Ratio***" means, subject to Section 1.5(g), the following ratio (rounded to four decimal places): the quotient obtained by dividing (a) the Company Merger Shares by (b) the Company Outstanding Shares, in which:

- "***Company Cash Balance Adjustment Shares***" means (i) if the Company Cash Amount is less than the Company Target, then an amount equal to the quotient of (A) the Company Target, *less* the Company Cash Amount, *divided by* (B) 1.207, or (ii) if the Company Cash Amount is greater than the Company Target, then zero.
- "***Company Allocation Percentage***" means 75%.
- "***Company Merger Shares***" means the sum of (i) the product of (A) the Post-Closing Parent Shares *multiplied by* (B) the Company Allocation Percentage, *minus* (ii) the Company Cash Balance Adjustment Shares, *minus* (iii) the Parent Cash Balance Adjustment Shares if the Parent Cash Amount is greater than the Parent Target, *plus* (iv) the Parent Cash Balance Adjustment Shares if the Parent Cash Amount is less than the Parent Target.
- "***Company Outstanding Shares***" means the total number of shares of Company Capital Stock outstanding immediately prior to the Effective Time expressed on an as-converted to Company Common Stock basis and assuming the effectiveness of the Preferred Stock Conversion, but excluding (i) the exercise of all Company Options and Company Warrants, in each case, outstanding as of immediately prior to the Effective Time, (ii) the issuance of shares of Company Capital Stock in respect of all other outstanding options, restricted stock awards, warrants or rights to receive such shares, whether conditional or unconditional and including any outstanding options, warrants or rights triggered by or associated with the consummation of the Merger, and (iii) any shares of Company Common Stock reserved for issuance.
- "***Parent Allocation Percentage***" means 25%.
- "***Parent Cash Balance Adjustment Shares***" means (i) if the Parent Cash Amount is less than the Parent Target, then an amount equal to the quotient of (A) the Parent Target, *less* the Parent Cash Amount, *divided by* (B) 1.207, or (ii) if the Parent Cash Amount is greater than the Parent Target, an amount equal to the quotient of (A) the Parent Cash Amount, *less* the Parent Target, *divided by* (B) 1.207.
- "***Parent Outstanding Shares***" means the total number of shares of Parent Common Stock outstanding immediately prior to the Effective Time, including the total number of shares of Parent Common Stock issuable pursuant to Parent Deferred Stock Rights but excluding (i) the issuance of shares of Parent Common Stock in respect of all Parent Options, Parent Warrants and other outstanding options, warrants or rights to receive such shares (other than the Parent Deferred Stock Rights), in each case, outstanding as of immediately prior to the Effective Time; and (ii) any shares of Parent Common Stock reserved for issuance (other than shares of Parent Common Stock reserved for issuance pursuant to the Parent Deferred Stock Rights).
- "***Post-Closing Parent Shares***" means the quotient determined by *dividing* (i) the Parent Outstanding Shares *by* (ii) the Parent Allocation Percentage.

"***GAAP***" means generally accepted accounting principles and practices in effect from time to time within the United States applied consistently throughout the period involved.

"***Governmental Authorization***" means any: (a) permit, license, certificate, certification, franchise, permission, approval, exemption, variance, exception, order, clearance, registration, qualification or authorization

issued, granted, given or otherwise made available by or under the authority of any Governmental Body or pursuant to any Law; or (b) right under any Contract with any Governmental Body.

"***Governmental Body***" means any: (a) nation, state, commonwealth, province, territory, county, municipality, district or other jurisdiction of any nature; (b) federal, state, local, municipal, foreign or other government; (c) governmental or quasi-governmental authority of any nature (including any governmental division, department, agency, commission, bureau, instrumentality, official, ministry, fund, foundation, center, organization, unit, body or Entity and any court or other tribunal, and for the avoidance of doubt, any taxing authority); or (d) self-regulatory organization (including Nasdaq).

"***Hazardous Materials***" means any pollutant, chemical, substance and any toxic, infectious, carcinogenic, reactive, corrosive, ignitable or flammable chemical, or chemical compound, or hazardous substance, material or waste, whether solid, liquid or gas, that is subject to regulation, control or remediation under any Environmental Law, including without limitation, crude oil or any fraction thereof, and petroleum products or by-products.

"***HSR Act***" means the Hart-Scott-Rodino Antitrust Improvements Act of 1976, as amended.

"***Intellectual Property Rights***" means and includes all past, present, and future rights of the following types, which may exist or be created under the laws of any jurisdiction in the world: (a) rights associated with works of authorship, including exclusive exploitation rights, copyrights, moral rights, software, databases, and mask works; (b) trademarks, service marks, trade dress, logos, trade names and other source identifiers, domain names and URLs and similar rights and any goodwill associated therewith; (c) rights associated with trade secrets, know how, inventions, invention disclosures, methods, processes, protocols, specifications, techniques and other forms of technology; (d) patents and industrial property rights; and (e) other similar proprietary rights in intellectual property of every kind and nature; (f) rights of privacy and publicity; and (g) all registrations, renewals, extensions, statutory invention registrations, provisionals, continuations, continuations-in-part, provisionals, divisions, or reissues of, and applications for, any of the rights referred to in clauses "(a)" through "(f)" above (whether or not in tangible form and including all tangible embodiments of any of the foregoing, such as samples, studies and summaries), along with all rights to prosecute and perfect the same through administrative prosecution, registration, recordation or other administrative proceeding, and all causes of action and rights to sue or seek other remedies arising from or relating to the foregoing.

"***IRS***" means the United States Internal Revenue Service.

"***Knowledge***" means, with respect to an individual, that such individual is actually aware of the relevant fact or such individual would reasonably be expected to know such fact in the ordinary course of the performance of such individual's employment responsibilities. Any Person that is an Entity shall have Knowledge if any officer or director of such Person as of the date such knowledge is imputed has Knowledge of such fact or other matter.

"***Law***" means any federal, state, national, foreign, material local or municipal or other law, statute, constitution, principle of common law, resolution, ordinance, code, edict, decree, rule, regulation, ruling or requirement issued, enacted, adopted, promulgated, implemented or otherwise put into effect by or under the authority of any Governmental Body (including under the authority of Nasdaq or the Financial Industry Regulatory Authority).

"***Legal Proceeding***" means any action, suit, litigation, arbitration, proceeding (including any civil, criminal, administrative, investigative or appellate proceeding), hearing, inquiry, audit, examination or investigation commenced, brought, conducted or heard by or before, or otherwise involving, any court or other Governmental Body or any arbitrator or arbitration panel.

"***Merger Sub Board***" means the board of directors of Merger Sub.

"***Nasdaq***" means the Nasdaq Stock Market, including the Nasdaq Global Select Market or such other Nasdaq market on which shares of Parent Common Stock are then listed.

"***Nasdaq Reverse Split***" means a reverse stock split of all outstanding shares of Parent Common Stock at a reverse stock split ratio as mutually agreed to by Parent and the Company that is effected by Parent for the purpose of maintaining compliance with Nasdaq listing standards.

"***Ordinary Course of Business***" means, in the case of each of the Company and Parent, such actions taken in the ordinary course of its normal operations and consistent with its past practices.

"***Organizational Documents***" means, with respect to any Person (other than an individual), (a) the certificate or articles of association or incorporation or organization or limited partnership or limited liability company, and any joint venture, limited liability company, operating or partnership agreement and other similar documents adopted or filed in connection with the creation, formation or organization of such Person and (b) all bylaws, regulations and similar documents or agreements relating to the organization or governance of such Person, in each case, as amended or supplemented.

"***Parent Associate***" means any current or former employee, independent contractor, officer or director of Parent.

"***Parent Balance Sheet***" means the unaudited balance sheet of Parent as of September 30, 2018 (the "***Parent Balance Sheet Date***"), included in Parent's Report on Form 10-Q for the quarterly period ended September 30, 2018, as filed with the SEC.

"***Parent Board***" means the board of directors of Parent.

"***Parent Cash Amount***" (i) the sum of all Cash and Cash Equivalents, short-term investments, accrued investment interest receivable, and any prepaid refundable deposits listed on Section 1.12(a) of the Parent Disclosure Schedule, in each case, of Parent as of the Determination Date, calculated in accordance with Section 1.12), *less* (ii) all liabilities of Parent to any current or former Parent officer, director, employee, consultant or independent contractor, including change of control payments, retention payments, severance and other employee-, consultant- or independent contractor-related termination costs, or other payments triggered by the Contemplated Transactions or pursuant to any Parent Benefit Plan, including but not limited to payments of deferred compensation, accrued but unpaid bonuses and accrued but unpaid vacation or paid time off (including related employer employment taxes on all the foregoing), regardless of whether or not such amounts are accrued or due as of the Determination Date and regardless of when paid or payable and regardless of whether such amounts will be paid or are payable as a result of actions taken at, or immediately prior to or after the Effective Time, *less* (iii) the Parent Transaction Expenses, *plus* (iv) any cash payable to Parent upon the closing of any SARM Transaction ("***SARM Upfront Cash***") that has been reduced to an executed letter of intent prior to Closing; *provided* such letter of intent shall require the Company's consent (which consent shall not be unreasonably withheld, delayed or conditioned); and, for the avoidance of doubt, the closing of the SARM Transaction shall not be required to occur prior to the Closing and any SARM Upfront Cash shall not be subject to any payment pursuant to the CVR (but for the avoidance of doubt, any payments in respect of such SARM Transaction other than the SARM Upfront Cash will be handled pursuant to the CVR).

"***Parent Change in Circumstance***" means a change in circumstances (other than an Acquisition Proposal) that affects the business, assets or operations of Parent that occurs or arises after the date of this Agreement.

"***Parent Closing Price***" means the volume weighted average closing trading price of a share of Parent Common Stock on Nasdaq for the five consecutive trading days ending five trading days immediately prior to the date upon which the Merger becomes effective.

"***Parent Closing Tax Opinion***" means a written opinion from Cooley, dated as of the Closing Date, based on the facts, representations, assumptions and exclusions set forth or described in such opinion, and substantially in the form set forth in Section 5.10(c)(3) of the Parent Disclosure Schedule, to the effect that the Merger will qualify for the Intended Tax Treatment. In rendering such opinion, Cooley shall be entitled to rely upon customary assumptions, representations, warranties and covenants reasonably satisfactory to it, including representations set forth in certificates of officers of Parent and the Company, in substantially the forms set forth in Section 5.10(c)(ii) of the Parent Disclosure Schedule and Section 5.10(c)(ii) of the Company Disclosure Schedule.

"***Parent Common Stock***" means the Common Stock, $0.01 par value per share, of Parent.

"***Parent Contract***" means any Contract: (a) to which Parent or Merger Sub is a party; (b) by which Parent, Merger Sub or any Parent IP or any other asset of Parent or Merger Sub is or may become bound or under which Parent or Merger Sub has, or may become subject to, any obligation; or (c) under which Parent or Merger Sub has or may acquire any right or interest.

"***Parent Deferred Stock Right***" means any deferred stock rights or other deferred rights to receive shares of Parent Common Stock under the Parent Stock Plans.

"***Parent ERISA Affiliate***" means any corporation or trade or business (whether or not incorporated) which is (or at any relevant time was) treated with Parent or any of its Subsidiaries as a single employer within the meaning of Section 414 of the Code.

"***Parent Fully-Diluted Shares***" means the total number of shares of Parent Common Stock outstanding immediately prior to the Effective Time expressed on a fully-diluted basis, assuming the issuance of Parent Common Stock in respect of all Parent Options, Parent Warrants, Parent Deferred Stock Rights, and other outstanding options, warrants or rights to receive such shares, in each case, outstanding as of immediately prior to the Effective Time.

"***Parent Fundamental Representations***" means the representations and warranties of Parent and Merger Sub set forth in Sections 3.1(a) and (b) (Due Organization; Subsidiaries), 3.3 (Authority; Binding Nature of Agreement), 3.4 (Vote Required), 3.6(a) and (c) (Capitalization) and 3.21 (No Financial Advisors).

"***Parent IP***" means all Intellectual Property Rights that are owned or purported to be owned by, assigned to, or licensed by, Parent or its Subsidiaries.

"***Parent Material Adverse Effect***" means any Effect that, considered together with all other Effects that have occurred prior to the date of determination of the occurrence of a Parent Material Adverse Effect, has or would reasonably be expected to have a material adverse effect on the business, financial condition, assets, liabilities or results of operations of Parent; *provided*, *however*, that Effects arising or resulting from the following shall not be taken into account in determining whether there has been a Parent Material Adverse Effect: (a) general business, economic or political conditions affecting the industry in which Parent operates, (b) any natural disaster or any acts of war, armed hostilities or terrorism, (c) changes in financial, banking or securities markets, (d) the taking of any action required to be taken by this Agreement, (e) any change in the stock price or trading volume of Parent Common Stock (it being understood, however, that any Effect causing or contributing to any change in stock price or trading volume of Parent Common Stock may be taken into account in determining whether a Parent Material Adverse Effect has occurred, unless such Effects are otherwise excepted from this definition), (f) the failure of Parent to meet internal or analysts' expectations or projections or the results of operations of Parent; (g) any clinical trial programs or studies, including any adverse data, event or outcome arising out of or related to any such programs or studies; (h) any change in, or any compliance with or action taken for the purpose of complying with, any Law or GAAP (or interpretations of any Law or GAAP); (i) resulting from the announcement of this Agreement or the pendency of the Contemplated Transactions; or

(j) resulting from the taking of any action or the failure to take any action, by Parent that is required to be taken by this Agreement, except in each case with respect to clauses (a) through (c), to the extent disproportionately affecting Parent relative to other similarly situated companies in the industries in which Parent operates.

"***Parent Options***" means options or other rights to purchase shares of Parent Common Stock issued by Parent.

"***Parent Registration Statement Tax Opinion***" means a written opinion from Cooley, dated as of such date as may be required by the SEC in connection with the filing of the Registration Statement, based on the facts, representations, assumptions and exclusions set forth or described in such opinion, and substantially in the form set forth in Section 5.10(c)(1) of the Parent Disclosure Schedule, to the effect that the Merger will qualify for the Intended Tax Treatment. In rendering such opinion, Cooley shall be entitled to rely upon customary assumptions, representations, warranties and covenants reasonably satisfactory to it, including representations set forth in certificates of officers of Parent and the Company, in substantially the forms set forth in Section 5.10(c)(i) of the Parent Disclosure Schedule and Section 5.10(c)(i) of the Company Disclosure Schedule.

"***Parent Stock Plans***" means, the Parent 2001 Stock Option Plan, the Parent 2002 Stock Option Plan, the Parent 2004 Equity Incentive Plan, the Parent Amended and Restated 2004 Non-Employee Directors' Stock Option Plan, the Parent 2013 Equity Incentive Plan, the Parent 2013 Non-Employee Director Equity Incentive Plan, 2018 Amended and Restated Directors' Deferred Compensation Plan, in each case, as may be amended from time to time.

"***Parent Target***" means $13,500,000 if the Closing occurs on or prior to April 30, 2019 (provided, that if any fees and expenses are incurred by Parent in connection with preparing its Quarterly Report on Form 10-Q for the first quarter of 2019 on or prior to April 30, 2019, such amounts will be added back to the Parent Cash Amount), *less* Parent's reasonable operating expenses from May 1, 2019 through the Closing.

"***Parent Transaction Expenses***" means all fees and expenses incurred by Parent at or prior to the Effective Time in connection with the Contemplated Transactions and this Agreement, including (a) any fees and expenses of legal counsel and accountants, the maximum amount of fees and expenses payable to financial advisors, investment bankers, brokers, consultants, and other advisors of Parent; (b) 50% of (i) the fees paid to the SEC in connection with filing the Registration Statement, the Proxy Statement, and any amendments and supplements thereto with the SEC; (ii) the Nasdaq Fees; (iii) the fees and expenses paid or payable to the Exchange Agent pursuant to the engagement agreement with the Exchange Agent; and (iv) any fees and expenses incurred by Toppan Merrill, Broadridge or the proxy solicitor in connection with the filing and distribution of the Registration Statement and any amendments and supplements thereto with the SEC (without duplication of the fees and expenses addressed in clause (b)(i) above); (c) 100% of the Combined Transaction Expenses; and (d) 100% of the D&O Tail Policy.

"***Parent Triggering Event***" shall be deemed to have occurred if: (a) Parent shall have failed to include in the Proxy Statement the Parent Board Recommendation or shall have made a Parent Board Adverse Recommendation Change; (b) the Parent Board or any committee thereof shall have publicly approved, endorsed or recommended any Acquisition Proposal; or (c) Parent shall have entered into any letter of intent or similar document relating to any Acquisition Proposal (other than a confidentiality agreement permitted pursuant to Section 4.4); or (d) Parent, or any director or officer of Parent, shall have willfully and intentionally breached the provisions set forth in Section 4.4.

"***Parent Warrants"*** means the warrants to purchase capital stock of the Parent listed on Section B of the Parent Disclosure Schedule.

"***Party***" or "***Parties***" means the Company, Merger Sub and Parent.

"***Permitted Alternative Agreement***" means a definitive agreement that contemplates or otherwise relates to an Acquisition Transaction that constitutes a Superior Offer.

"***Permitted Encumbrance***" means: (a) any liens for current Taxes not yet due and payable or for Taxes that are being contested in good faith and for which adequate reserves have been made on the Company Unaudited Interim Balance Sheet or the Parent Balance Sheet, as applicable; (b) minor liens that have arisen in the Ordinary Course of Business and that do not (in any case or in the aggregate) materially detract from the value of the assets or properties subject thereto or materially impair the operations of the Company or any of its Subsidiaries or Parent, as applicable; (c) statutory liens to secure obligations to landlords, lessors or renters under leases or rental agreements; (d) deposits or pledges made in connection with, or to secure payment of, workers' compensation, unemployment insurance or similar programs mandated by Law; (e) non-exclusive licenses of Intellectual Property Rights granted by the Company or any of its Subsidiaries or Parent, as applicable, in the Ordinary Course of Business and that do not (in any case or in the aggregate) materially detract from the value of the Intellectual Property Rights subject thereto; and (f) statutory liens in favor of carriers, warehousemen, mechanics and materialmen, to secure claims for labor, materials or supplies.

"***Person***" means any individual, Entity or Governmental Body.

"***Proxy Statement***" means the proxy statement to be sent to Parent's stockholders in connection with the Parent Stockholders' Meeting.

"***Reference Date***" means March 5, 2019.

"***Registered IP***" means all Intellectual Property Rights that are registered or issued under the authority of any Governmental Body, including all patents, registered copyrights, registered mask works, and registered trademarks, service marks and trade dress, and all applications for any of the foregoing.

"***Registration Statement***" means the registration statement on Form S-4 (or any other applicable form under the Securities Act to register Parent Common Stock) to be filed with the SEC by Parent registering the public offering and sale of Parent Common Stock to some or all holders of Company Capital Stock in the Merger, including all shares of Parent Common Stock to be issued in exchange for all shares of Company Capital Stock in the Merger, as said registration statement may be amended prior to the time it is declared effective by the SEC.

"***Representatives***" means directors, officers, employees, agents, attorneys, accountants, investment bankers, advisors and representatives.

"***Restricted Cash***" means any cash or cash equivalents that are unavailable for dividend or distribution as a result of the requirements of applicable Law or the dividend or distribution of which is subject to Tax, including any withholding or other similar Tax, or the dividend or distribution of which would produce other adverse Tax consequences for Parent or its Affiliates.

"***Sarbanes-Oxley Act***" means the Sarbanes-Oxley Act of 2002.

"***SARM Transaction***" means a sale of Parent's SARM assets.

"***SEC***" means the United States Securities and Exchange Commission.

"***Securities Act***" means the Securities Act of 1933, as amended.

"***Series A Preferred Stock***" means the shares of the Series A Preferred Stock of the Company, par value $0.0001 per share.

"***Series B Preferred Stock***" means the shares of the Series B Preferred Stock of the Company, par value $0.0001 per share.

"***Series B-2 Preferred Stock***" means the shares of the Series B-2 Preferred Stock of the Company, par value $0.0001 per share.

"***Series C Preferred Stock***" means the shares of the Series C Preferred Stock of the Company, par value $0.0001 per share.

"***Subsequent Transaction***" means any Acquisition Transaction (with all references to 20% in the definition of Acquisition Transaction being treated as references to 85% for these purposes).

An entity shall be deemed to be a "***Subsidiary***" of a Person if such Person directly or indirectly owns or purports to own, beneficially or of record, (a) an amount of voting securities or other interests in such entity that is sufficient to enable such Person to elect at least a majority of the members of such entity's board of directors or other governing body, or (b) at least 50% of the outstanding equity, voting, beneficial or financial interests in such Entity.

"***Superior Offer***" means an unsolicited bona fide written Acquisition Proposal (with all references to 20% in the definition of Acquisition Transaction being treated as references to greater than 80% for these purposes) that: (a) was not obtained or made as a direct or indirect result of a breach of (or in violation of) this Agreement; and (b) is on terms and conditions that the Parent Board or the Company Board, as applicable, determines in good faith, based on such matters that it deems relevant (including the likelihood of consummation thereof), as well as any written offer by the other Party to this Agreement to amend the terms of this Agreement, and following consultation with its outside legal counsel and outside financial advisors, if any, are more favorable, from a financial point of view, to Parent's stockholders or the Company's stockholders, as applicable, than the terms of the Contemplated Transactions; *provided*, that any such offer shall not be deemed to be a "Superior Offer" if any financing required to consummate the transaction contemplated by such offer is not reasonably capable of being obtained by such third party.

"***Takeover Statute***" means any "fair price," "moratorium," "control share acquisition" or other similar anti-takeover Law.

"***Tax***" means any federal, state, local, foreign or other tax, including any income, capital gain, gross receipts, capital stock, profits, transfer, estimated, registration, stamp, premium, escheat, unclaimed property, customs duty, ad valorem, occupancy, occupation, alternative, add-on, windfall profits, value added, severance, property, business, production, sales, use, license, excise, franchise, employment, payroll, social security, disability, unemployment, workers' compensation, national health insurance, withholding or other taxes, duties, fees, assessments or governmental charges, surtaxes or deficiencies thereof of any kind whatsoever, however denominated, and including any fine, penalty, addition to tax or interest imposed by a Governmental Body with respect thereto.

"***Tax Return***" means any return (including any information return), report, statement, declaration, estimate, schedule, notice, notification, form, election, certificate or other document, and any amendment or supplement to any of the foregoing, filed with or submitted to, or required to be filed with or submitted to, any Governmental Body in connection with the determination, assessment, collection or payment of any Tax or in connection with the administration, implementation or enforcement of or compliance with any Law relating to any Tax.

"***Treasury Regulations***" means the United States Treasury regulations promulgated under the Code.

"***WARN Act***" means the Worker Adjustment Retraining and Notification Act of 1988, as amended, or any similar state or local plant closing mass layoff statute, rule or regulation.

b) Each of the following terms is defined in the Section set forth opposite such term:

Term	Section
Accounting Firm	1.12(e)
Allocation Certificate	5.17(a)
Amended Plan	5.20
Anti-Bribery Laws	2.23
Anticipated Closing Date	1.12(a)
Board Observer	5.12(c)
Business Associate Agreement	2.14(f)
Certificate of Merger	1.3
Certifications	3.7(a)
Closing	1.3
Closing Date	1.3
Cooley	5.10(c)
Company	Preamble
Company Audited Financial Statements	5.17
Company Benefit Plan	2.17(a)
Company Board Adverse Recommendation Change	5.2(d)
Company Board Recommendation	5.2(d)
Company Cash Calculation	1.13(a)
Company Cash Schedule	1.13(a)
Company Disclosure Schedule	Section 2
Company Financials	2.7(a)
Company In-bound Licenses	2.12(d)
Company Interim Financial Statements	5.17
Company Lock-Up Agreement	Recitals
Company Material Contract	2.13(a)
Company Out-bound Licenses	2.12(d)
Company Permits	2.14(b)
Company Plan	2.6(c)
Company Preferred Stock	2.6(a)
Company Real Estate Leases	2.11
Company Signatories	Recitals
Company Stock Certificate	1.7
Company Stockholder Matters	5.2(a)
Company Stockholder Support Agreement	Recitals
Company Stockholder Written Consent	2.4
Costs	5.6(a)
CVR	1.6
CVR Agreement	Recitals
D&O Indemnified Parties	5.6(a)
D&O Tail Policy	5.6(d)
Determination Date	1.12(a)
Determination Notice	5.3(d)(i)
Dispute Notice	1.12(b)
Dissenting Shares	1.9(a)
Drug Regulatory Agency	2.14(a)
Effective Time	1.3
End Date	9.1(b)
Exchange Agent	1.8(a)
Exchange Fund	1.8(a)

Term	Section
FDA	2.14(a)
FDCA	2.14(a)
FLSA	2.17(p)
HIPAA	2.14(f)
Information Statement	5.2(a)
Intended Tax Treatment	5.10(a)
Investor Agreements	2.22(b)
Latham	5.10(c)
Liability	2.9
Merger	Recitals
Merger Consideration	1.5(a)(ii)
Merger Notification Filings	5.4(b)
Merger Sub	Preamble
Nasdaq Fees	5.9
Nasdaq Listing Application	5.9
Other Parent Stockholder Matter	5.3(a)(v)
Parent	Preamble
Parent Benefit Plan	3.17(a)
Parent Board Adverse Recommendation Change	5.3(c)
Parent Board Recommendation	5.3(c)
Parent Budget	4.1(b)(v)
Parent Cash Calculation	1.12(a)
Parent Cash Schedule	1.12(a)
Parent Designees	5.12
Parent Disclosure Schedule	Section 3
Parent In-bound License	3.12(d)
Parent Lock-Up Agreement	Recitals
Parent Material Contract	3.13
Parent Out-bound License	3.12(d)
Parent Permits	3.14(b)
Parent Real Estate Leases	3.11
Parent SEC Documents	3.7(a)
Parent Signatories	Recitals
Parent Stockholder Matters	5.3(a)(iv)
Parent Stockholder Support Agreement	Recitals
Parent Stockholders’ Meeting	5.3(a)(iv)
Pre-Closing Period	4.1(a)
Preferred Stock Conversion	5.21
Required Company Stockholder Vote	2.4
Required Parent Stockholder Vote	3.4
Response Date	1.12(b)
Sensitive Data	2.12(g)
Stockholder Notice	5.2(c)
Surviving Corporation	1.1

Exhibit C

Officers

Name	Title
James Breitmeyer	President and Chief Executive Officer
Richard Vincent	Chief Financial Officer
Lauren Otsuki	Chief Operating Officer

Board Designees – Company

Name

David Hale

James Breitmeyer

Yanjun Liu

Xin Nakanishi

Board Designees – Parent

Name

Michael Carter, who shall be placed in the same class of Parent's current directors elected at Parent's 2019 annual meeting

Robert Wills

Additional Directors

Charles Theuer

William LaRue

Director to be designated by the Company

Board Observer – Parent

Name

J.R. Hyde, III (or his designee)

Annex B

Member FINRA/SIPC

601 California St., Suite 500
San Francisco, CA 94108

March 6, 2019

Board of Directors
GTx, Inc.
175 Toyota Plaza, 7th Floor
Memphis, Tennessee 38103

Members of the Board of Directors:

You have asked us to advise you with respect to the fairness, from a financial point of view, to the holders of common stock, par value $0.001 per share (the "Common Stock"), of GTx, Inc., a Delaware corporation ("GTx," or "Parent") of (i) the Exchange Ratio used to determine the number of shares of Parent Common Stock to be issued to the holders of Company Common Stock and the number of Parent Options and Parent Warrants to be substituted for the Company Options and Company Warrants to be assumed by Parent, as contemplated by the Agreement and Plan Merger and Reorganization dated March 6, 2019 by and among Parent, Grizzly Merger Sub, Inc., a Delaware corporation and wholly owned subsidiary of Parent ("Merger Sub"), and Oncternal Therapeutics, Inc., a Delaware corporation ("Oncternal") (the "Merger Agreement") and (ii) the right of the holders of Parent Common Stock as of immediately prior to the Effective Time to receive contingent cash payments pursuant to the CVR Agreement ((i) and (ii), the "Consideration"). Defined terms used herein but not otherwise defined are given the meaning set forth in the Merger Agreement or the CVR Agreement, as the case may be.

In arriving at our opinion, we have reviewed, analyzed and considered the Merger Agreement and the CVR Agreement; certain publicly available business and financial information relating to Parent and Oncternal; the publicly available financial terms of certain sale transactions involving companies we deemed relevant and the consideration paid for such companies and comparisons of these terms with the proposed financial terms of the Merger and the CVR Agreement (together, the "Transaction"); and such other publicly available financial and business information concerning certain other companies we deemed relevant and comparisons of this financial and business information to that of Parent and Oncternal. We have also reviewed (i) certain other non-public information relating to Parent that was prepared and provided to us by Parent, including certain operating and financial information relating to Parent's business, including Parent's unaudited financial statements for the year ended December 31, 2018 and financial and business forecasts and projections prepared by management of Parent relating to Parent's prospects; (ii) certain other non-public information relating to Oncternal that was prepared and provided to us by Oncternal, including certain operating and financial information relating to Oncternal's business, including Oncternal's unaudited financial statements for the year ended December 31, 2018 and financial and business forecasts and projections prepared by management of Oncternal relating to Oncternal's prospects; and (iii) such other information that we have considered appropriate to opine as to the fairness of the Consideration. In addition, we have discussed with management of Parent and management of Oncternal, the business, operations, financial condition and prospects of each of Parent and Oncternal, respectively, and as a combined company.

In connection with our review, we have not assumed any responsibility for independent verification of any of the foregoing information and have, with your consent, relied on such information being complete and accurate. With respect to the financial forecasts for Parent, the management of Parent has advised us, and we have

assumed with your consent, that such forecasts have been reasonably prepared on bases reflecting the best currently available estimates and judgments of the management of Parent as to the future financial performance of Parent; and, with respect to the financial forecasts for Oncternal, the management of Oncternal has advised us, and we have assumed with your consent, that such forecasts have been reasonably prepared on bases reflecting the best currently available estimates and judgments of the management of Oncternal as to the future financial performance of Oncternal. We have relied upon, without independent verification, the assessment of each of Parent's management and Oncternal's management as to the viability of, and risks associated with, the current and future products of the combined company following the Transaction (including without limitation, the development, testing and marketing of such products, the receipt of all necessary governmental and other regulatory approvals for the development, testing and marketing thereof, and the life and enforceability of all relevant patents and other intellectual and other property rights associated with such products). We have assumed that Parent will not materially breach its obligations under the CVR Agreement and will use Commercially Reasonable Efforts to develop one or more SARD Compounds in accordance with the Development Plan and monetize the SARM Technology and SARM Products following the closing of the Transaction, but express no view as to whether the SARD Compounds, SARM Technology or SARM Products will ultimately be developed or monetized. We have also assumed, with your consent, that, in the course of obtaining any regulatory or third party consents, approvals or agreements in connection with the Transaction no delay, limitation, restriction or condition will be imposed that would have an adverse effect on Parent, Oncternal or the combined company, or the contemplated benefits of the Transaction, and that the Transaction will be consummated in accordance with the terms of the Merger Agreement without waiver, modification or amendment of any material term, condition or agreement thereof or any waiver, modification or amendment of any material term, condition or agreement of the CVR Agreement. In addition, we have not been requested to make, and have not made, an independent evaluation or appraisal of the assets or liabilities (contingent or otherwise) of Parent or Oncternal, nor did we conduct a physical inspection of any of the properties or facilities of Parent or Oncternal, nor have we been furnished with any such evaluations, appraisals or inspections, nor do we assume any responsibility to obtain any such evaluations, appraisals or inspections. We have also assumed that the representations and warranties contained in the Merger Agreement made by the parties thereto are true and correct in all respects material to our analysis. We also reviewed a discounted cash flow analysis of a SARD Product prepared and provided to us by Parent, but determined that the projections underlying the analysis were too speculative to use in our analysis of the fairness of the Consideration.

Our opinion addresses only the fairness, from a financial point of view, to the holders of Parent Common Stock of the Consideration and does not address any other aspect or implication of the Transaction or any other agreement, arrangement or understanding entered into in connection with the Transaction or otherwise. Our opinion is necessarily based upon information made available to us as of the date hereof and financial, economic, market and other conditions as they exist and can be evaluated on the date hereof. We do not express any opinion as to the price or range of prices at which the shares of Parent Common Stock may trade subsequent to the announcement or closing of the Transaction or at any time.

We have acted as financial advisor to Parent in connection with the Transaction. We will receive a fee for our services, a portion of which is payable upon delivery of this opinion and a significant portion of which is contingent upon consummation of the Transaction. In addition, Parent has agreed to indemnify us for certain liabilities and other items arising out of our engagement.

You have not asked us to address, and this opinion does not address, the relative merits of the Transaction as compared to alternative transactions or strategies that might be available to Parent, nor the underlying business decision of Parent to proceed with the Transaction. Our opinion addresses only the fairness, from a financial point of view, to the holders of Parent Common Stock of the Consideration, and we express no opinion as to the fairness of any consideration paid in connection with the Transaction to the holders of any other class of

securities, creditors or other constituencies of Parent as to the underlying decision by Parent to engage in the Transaction. We are not legal, tax or regulatory advisors and have relied upon, without independent verification, the assessment of Parent and its legal, tax and regulatory advisors with respect to such matters. We have not performed any tax analysis, nor have we been furnished with any such analysis.

The issuance of this opinion has been approved by a fairness opinion committee of Aquilo Partners, L.P. ("Aquilo Partners"). This opinion is for the use and benefit of the Board of Directors of Parent in connection with its evaluation of the Transaction. This opinion does not constitute a recommendation to any stockholder as to how such stockholder should vote with respect to the Transaction or any other matter. Except as otherwise provided in our engagement letter with Parent, this opinion shall not be reproduced, disseminated, quoted, summarized or referred to at any time, in any manner or for any purpose, nor shall any public references to Aquilo Partners or any of its affiliates be made by Parent or any of its affiliates, without the prior written consent of Aquilo Partners, provided that this opinion may be reproduced in full in any proxy or information statement provided to stockholders of Parent.

Based upon and subject to the foregoing, it is our opinion that, as of the date hereof, the Consideration is fair, from a financial point of view, to the holders of Parent Common Stock.

Very truly yours,

AQUILO PARTNERS, L.P.

By: */s/ John Rumsey*
John Rumsey
Managing Director

Annex C

GENERAL CORPORATION LAW OF THE STATE OF DELAWARE REGARDING APPRAISAL RIGHTS

SECTION 262 OF THE GENERAL CORPORATION LAW OF THE STATE OF DELAWARE

§ 262. Appraisal rights.

(a) Any stockholder of a corporation of this State who holds shares of stock on the date of the making of a demand pursuant to subsection (d) of this section with respect to such shares, who continuously holds such shares through the effective date of the merger or consolidation, who has otherwise complied with subsection (d) of this section and who has neither voted in favor of the merger or consolidation nor consented thereto in writing pursuant to § 228 of this title shall be entitled to an appraisal by the Court of Chancery of the fair value of the stockholder's shares of stock under the circumstances described in subsections (b) and (c) of this section. As used in this section, the word "stockholder" means a holder of record of stock in a corporation; the words "stock" and "share" mean and include what is ordinarily meant by those words; and the words "depository receipt" mean a receipt or other instrument issued by a depository representing an interest in 1 or more shares, or fractions thereof, solely of stock of a corporation, which stock is deposited with the depository.

(b) Appraisal rights shall be available for the shares of any class or series of stock of a constituent corporation in a merger or consolidation to be effected pursuant to § 251 (other than a merger effected pursuant to § 251(g) of this title and, subject to paragraph (b)(3) of this section, § 251(h) of this title), § 252, § 254, § 255, § 256, § 257, § 258, § 263 or § 264 of this title:

(1) Provided, however, that, except as expressly provided in § 363(b) of this title, no appraisal rights under this section shall be available for the shares of any class or series of stock, which stock, or depository receipts in respect thereof, at the record date fixed to determine the stockholders entitled to receive notice of the meeting of stockholders to act upon the agreement of merger or consolidation, were either: (i) listed on a national securities exchange or (ii) held of record by more than 2,000 holders; and further provided that no appraisal rights shall be available for any shares of stock of the constituent corporation surviving a merger if the merger did not require for its approval the vote of the stockholders of the surviving corporation as provided in § 251(f) of this title.

(2) Notwithstanding paragraph (b)(1) of this section, appraisal rights under this section shall be available for the shares of any class or series of stock of a constituent corporation if the holders thereof are required by the terms of an agreement of merger or consolidation pursuant to §§ 251, 252, 254, 255, 256, 257, 258, 263 and 264 of this title to accept for such stock anything except:

a. Shares of stock of the corporation surviving or resulting from such merger or consolidation, or depository receipts in respect thereof;

b. Shares of stock of any other corporation, or depository receipts in respect thereof, which shares of stock (or depository receipts in respect thereof) or depository receipts at the effective date of the merger or consolidation will be either listed on a national securities exchange or held of record by more than 2,000 holders;

c. Cash in lieu of fractional shares or fractional depository receipts described in the foregoing paragraphs (b)(2)a. and b. of this section; or

d. Any combination of the shares of stock, depository receipts and cash in lieu of fractional shares or fractional depository receipts described in the foregoing paragraphs (b)(2)a., b. and c. of this section.

(3) In the event all of the stock of a subsidiary Delaware corporation party to a merger effected under § 251(h), § 253 or § 267 of this title is not owned by the parent immediately prior to the merger, appraisal rights shall be available for the shares of the subsidiary Delaware corporation.

(4) In the event of an amendment to a corporation's certificate of incorporation contemplated by § 363(a) of this title, appraisal rights shall be available as contemplated by § 363(b) of this title, and the procedures of this section, including those set forth in subsections (d) and (e) of this section, shall apply as nearly as practicable, with the word "amendment" substituted for the words "merger or consolidation," and the word "corporation" substituted for the words "constituent corporation" and/or "surviving or resulting corporation."

(c) Any corporation may provide in its certificate of incorporation that appraisal rights under this section shall be available for the shares of any class or series of its stock as a result of an amendment to its certificate of incorporation, any merger or consolidation in which the corporation is a constituent corporation or the sale of all or substantially all of the assets of the corporation. If the certificate of incorporation contains such a provision, the provisions of this section, including those set forth in subsections (d), (e), and (g) of this section, shall apply as nearly as is practicable.

(d) Appraisal rights shall be perfected as follows:

(1) If a proposed merger or consolidation for which appraisal rights are provided under this section is to be submitted for approval at a meeting of stockholders, the corporation, not less than 20 days prior to the meeting, shall notify each of its stockholders who was such on the record date for notice of such meeting (or such members who received notice in accordance with § 255(c) of this title) with respect to shares for which appraisal rights are available pursuant to subsection (b) or (c) of this section that appraisal rights are available for any or all of the shares of the constituent corporations, and shall include in such notice a copy of this section and, if 1 of the constituent corporations is a nonstock corporation, a copy of § 114 of this title. Each stockholder electing to demand the appraisal of such stockholder's shares shall deliver to the corporation, before the taking of the vote on the merger or consolidation, a written demand for appraisal of such stockholder's shares. Such demand will be sufficient if it reasonably informs the corporation of the identity of the stockholder and that the stockholder intends thereby to demand the appraisal of such stockholder's shares. A proxy or vote against the merger or consolidation shall not constitute such a demand. A stockholder electing to take such action must do so by a separate written demand as herein provided. Within 10 days after the effective date of such merger or consolidation, the surviving or resulting corporation shall notify each stockholder of each constituent corporation who has complied with this subsection and has not voted in favor of or consented to the merger or consolidation of the date that the merger or consolidation has become effective; or

(2) If the merger or consolidation was approved pursuant to § 228, § 251(h), § 253, or § 267 of this title, then either a constituent corporation before the effective date of the merger or consolidation or the surviving or resulting corporation within 10 days thereafter shall notify each of the holders of any class or series of stock of such constituent corporation who are entitled to appraisal rights of the approval of the merger or consolidation and that appraisal rights are available for any or all shares of such class or series of stock of such constituent corporation, and shall include in such notice a copy of this section and,

if 1 of the constituent corporations is a nonstock corporation, a copy of § 114 of this title. Such notice may, and, if given on or after the effective date of the merger or consolidation, shall, also notify such stockholders of the effective date of the merger or consolidation. Any stockholder entitled to appraisal rights may, within 20 days after the date of mailing of such notice or, in the case of a merger approved pursuant to § 251(h) of this title, within the later of the consummation of the offer contemplated by § 251(h) of this title and 20 days after the date of mailing of such notice, demand in writing from the surviving or resulting corporation the appraisal of such holder's shares. Such demand will be sufficient if it reasonably informs the corporation of the identity of the stockholder and that the stockholder intends thereby to demand the appraisal of such holder's shares. If such notice did not notify stockholders of the effective date of the merger or consolidation, either (i) each such constituent corporation shall send a second notice before the effective date of the merger or consolidation notifying each of the holders of any class or series of stock of such constituent corporation that are entitled to appraisal rights of the effective date of the merger or consolidation or (ii) the surviving or resulting corporation shall send such a second notice to all such holders on or within 10 days after such effective date; provided, however, that if such second notice is sent more than 20 days following the sending of the first notice or, in the case of a merger approved pursuant to § 251(h) of this title, later than the later of the consummation of the offer contemplated by § 251(h) of this title and 20 days following the sending of the first notice, such second notice need only be sent to each stockholder who is entitled to appraisal rights and who has demanded appraisal of such holder's shares in accordance with this subsection. An affidavit of the secretary or assistant secretary or of the transfer agent of the corporation that is required to give either notice that such notice has been given shall, in the absence of fraud, be prima facie evidence of the facts stated therein. For purposes of determining the stockholders entitled to receive either notice, each constituent corporation may fix, in advance, a record date that shall be not more than 10 days prior to the date the notice is given, provided, that if the notice is given on or after the effective date of the merger or consolidation, the record date shall be such effective date. If no record date is fixed and the notice is given prior to the effective date, the record date shall be the close of business on the day next preceding the day on which the notice is given.

(e) Within 120 days after the effective date of the merger or consolidation, the surviving or resulting corporation or any stockholder who has complied with subsections (a) and (d) of this section hereof and who is otherwise entitled to appraisal rights, may commence an appraisal proceeding by filing a petition in the Court of Chancery demanding a determination of the value of the stock of all such stockholders. Notwithstanding the foregoing, at any time within 60 days after the effective date of the merger or consolidation, any stockholder who has not commenced an appraisal proceeding or joined that proceeding as a named party shall have the right to withdraw such stockholder's demand for appraisal and to accept the terms offered upon the merger or consolidation. Within 120 days after the effective date of the merger or consolidation, any stockholder who has complied with the requirements of subsections (a) and (d) of this section hereof, upon written request, shall be entitled to receive from the corporation surviving the merger or resulting from the consolidation a statement setting forth the aggregate number of shares not voted in favor of the merger or consolidation and with respect to which demands for appraisal have been received and the aggregate number of holders of such shares. Such written statement shall be mailed to the stockholder within 10 days after such stockholder's written request for such a statement is received by the surviving or resulting corporation or within 10 days after expiration of the period for delivery of demands for appraisal under subsection (d) of this section hereof, whichever is later. Notwithstanding subsection (a) of this section, a person who is the beneficial owner of shares

of such stock held either in a voting trust or by a nominee on behalf of such person may, in such person's own name, file a petition or request from the corporation the statement described in this subsection.

(f) Upon the filing of any such petition by a stockholder, service of a copy thereof shall be made upon the surviving or resulting corporation, which shall within 20 days after such service file in the office of the Register in Chancery in which the petition was filed a duly verified list containing the names and addresses of all stockholders who have demanded payment for their shares and with whom agreements as to the value of their shares have not been reached by the surviving or resulting corporation. If the petition shall be filed by the surviving or resulting corporation, the petition shall be accompanied by such a duly verified list. The Register in Chancery, if so ordered by the Court, shall give notice of the time and place fixed for the hearing of such petition by registered or certified mail to the surviving or resulting corporation and to the stockholders shown on the list at the addresses therein stated. Such notice shall also be given by 1 or more publications at least 1 week before the day of the hearing, in a newspaper of general circulation published in the City of Wilmington, Delaware or such publication as the Court deems advisable. The forms of the notices by mail and by publication shall be approved by the Court, and the costs thereof shall be borne by the surviving or resulting corporation.

(g) At the hearing on such petition, the Court shall determine the stockholders who have complied with this section and who have become entitled to appraisal rights. The Court may require the stockholders who have demanded an appraisal for their shares and who hold stock represented by certificates to submit their certificates of stock to the Register in Chancery for notation thereon of the pendency of the appraisal proceedings; and if any stockholder fails to comply with such direction, the Court may dismiss the proceedings as to such stockholder. If immediately before the merger or consolidation the shares of the class or series of stock of the constituent corporation as to which appraisal rights are available were listed on a national securities exchange, the Court shall dismiss the proceedings as to all holders of such shares who are otherwise entitled to appraisal rights unless (1) the total number of shares entitled to appraisal exceeds 1% of the outstanding shares of the class or series eligible for appraisal, (2) the value of the consideration provided in the merger or consolidation for such total number of shares exceeds $1 million, or (3) the merger was approved pursuant to § 253 or § 267 of this title.

(h) After the Court determines the stockholders entitled to an appraisal, the appraisal proceeding shall be conducted in accordance with the rules of the Court of Chancery, including any rules specifically governing appraisal proceedings. Through such proceeding the Court shall determine the fair value of the shares exclusive of any element of value arising from the accomplishment or expectation of the merger or consolidation, together with interest, if any, to be paid upon the amount determined to be the fair value. In determining such fair value, the Court shall take into account all relevant factors. Unless the Court in its discretion determines otherwise for good cause shown, and except as provided in this subsection, interest from the effective date of the merger through the date of payment of the judgment shall be compounded quarterly and shall accrue at 5% over the Federal Reserve discount rate (including any surcharge) as established from time to time during the period between the effective date of the merger and the date of payment of the judgment. At any time before the entry of judgment in the proceedings, the surviving corporation may pay to each stockholder entitled to appraisal an amount in cash, in which case interest shall accrue thereafter as provided herein only upon the sum of (1) the difference, if any, between the amount so paid and the fair value of the shares as determined by the Court, and (2) interest theretofore accrued, unless paid at that time. Upon application by the surviving or resulting corporation or by any stockholder entitled to participate in the appraisal proceeding, the Court may, in its discretion, proceed to trial upon

the appraisal prior to the final determination of the stockholders entitled to an appraisal. Any stockholder whose name appears on the list filed by the surviving or resulting corporation pursuant to subsection (f) of this section and who has submitted such stockholder's certificates of stock to the Register in Chancery, if such is required, may participate fully in all proceedings until it is finally determined that such stockholder is not entitled to appraisal rights under this section.

(i) The Court shall direct the payment of the fair value of the shares, together with interest, if any, by the surviving or resulting corporation to the stockholders entitled thereto. Payment shall be so made to each such stockholder, in the case of holders of uncertificated stock forthwith, and the case of holders of shares represented by certificates upon the surrender to the corporation of the certificates representing such stock. The Court's decree may be enforced as other decrees in the Court of Chancery may be enforced, whether such surviving or resulting corporation be a corporation of this State or of any state.

(j) The costs of the proceeding may be determined by the Court and taxed upon the parties as the Court deems equitable in the circumstances. Upon application of a stockholder, the Court may order all or a portion of the expenses incurred by any stockholder in connection with the appraisal proceeding, including, without limitation, reasonable attorney's fees and the fees and expenses of experts, to be charged pro rata against the value of all the shares entitled to an appraisal.

(k) From and after the effective date of the merger or consolidation, no stockholder who has demanded appraisal rights as provided in subsection (d) of this section shall be entitled to vote such stock for any purpose or to receive payment of dividends or other distributions on the stock (except dividends or other distributions payable to stockholders of record at a date which is prior to the effective date of the merger or consolidation); provided, however, that if no petition for an appraisal shall be filed within the time provided in subsection (e) of this section, or if such stockholder shall deliver to the surviving or resulting corporation a written withdrawal of such stockholder's demand for an appraisal and an acceptance of the merger or consolidation, either within 60 days after the effective date of the merger or consolidation as provided in subsection (e) of this section or thereafter with the written approval of the corporation, then the right of such stockholder to an appraisal shall cease. Notwithstanding the foregoing, no appraisal proceeding in the Court of Chancery shall be dismissed as to any stockholder without the approval of the Court, and such approval may be conditioned upon such terms as the Court deems just; provided, however that this provision shall not affect the right of any stockholder who has not commenced an appraisal proceeding or joined that proceeding as a named party to withdraw such stockholder's demand for appraisal and to accept the terms offered upon the merger or consolidation within 60 days after the effective date of the merger or consolidation, as set forth in subsection (e) of this section.

(l) The shares of the surviving or resulting corporation to which the shares of such objecting stockholders would have been converted had they assented to the merger or consolidation shall have the status of authorized and unissued shares of the surviving or resulting corporation.

Annex D

CERTIFICATE OF AMENDMENT

TO THE

RESTATED CERTIFICATE OF INCORPORATION

OF

GTX, INC.

GTx, Inc. (the "***Corporation***"), a corporation organized and existing under and by virtue of the General Corporation Law of the State of Delaware, as amended (the "***DGCL***"), hereby certifies as follows:

A. The name of the Corporation is GTx, Inc. The date of filing of the original Certificate of Incorporation of the Corporation with the Secretary of State of the State of Delaware was September 4, 2003, as restated on February 6, 2004.

B. This Certificate of Amendment to the Restated Certificate of Incorporation (the "***Certificate of Amendment***") amends the Corporation's Restated Certificate of Incorporation filed with the Secretary of State of the State of Delaware on February 6, 2004 (the "***Prior Certificate***"), and has been duly adopted by the Corporation's Board of Directors and stockholders in accordance with the provisions of Section 242 of the DGCL.

C. Section A of Article IV of the Prior Certificate is hereby amended and restated to read in its entirety as follows:

"A. Authorized Stock. The total number of shares which the Corporation shall have authority to issue is sixty-five million (65,000,000), consisting of sixty million (60,000,000) shares of Common Stock, par value $0.001 per share (the "Common Stock"), and five million (5,000,000) shares of Preferred Stock, par value $0.001 per share (the "Preferred Stock").

Immediately upon the filing of this Certificate of Amendment to the Restated Certificate of Incorporation with the Secretary of State of the State of Delaware each ( ) shares of Common Stock outstanding immediately prior to such filing shall be automatically reclassified into one (1) share of Common Stock. The aforementioned reclassification shall be referred to collectively as the "Reverse Split."

The Reverse Split shall occur without any further action on the part of the Corporation or stockholders of the Corporation and whether or not certificates representing such stockholders' shares prior to the Reverse Split are surrendered for cancellation. No fractional interest in a share of Common Stock shall be deliverable upon the Reverse Split. All shares of Common Stock (including fractions thereof) issuable upon the Reverse Split held by a holder prior to the Reverse Split shall be aggregated for purposes of determining whether the Reverse Split would result in the issuance of any fractional share. Any fractional share resulting from such aggregation upon the Reverse Split shall be rounded down to the nearest whole number. Each holder who would otherwise be entitled to a fraction of a share of Common Stock upon the Reverse Split (after aggregating all fractions of a share to which such stockholder would otherwise be entitled) shall, in lieu thereof, be entitled to receive a cash payment in an amount equal to the fraction to which the stockholder would otherwise be entitled multiplied by the closing price of the Corporation's Common Stock as reported on the Nasdaq Capital Market on the date of the filing of this Certificate of Amendment to the Restated Certificate of Incorporation with the Secretary of State of the State of Delaware. The Corporation shall not be obliged to issue certificates evidencing the shares of

Common Stock outstanding as a result of the Reverse Split unless and until the certificates evidencing the shares held by a holder prior to the Reverse Split are either delivered to the Corporation or its transfer agent, or the holder notifies the Corporation or its transfer agent that such certificates have been lost, stolen or destroyed and executes an agreement satisfactory to the Corporation to indemnify the Corporation from any loss incurred by it in connection with such certificates."

D. The Certificate of Amendment of the Prior Certificate so adopted reads in full as set forth above and is hereby incorporated by reference. All other provisions of the Prior Certificate remain in full force and effect.

IN WITNESS WHEREOF, GTx, Inc. has caused this Certificate of Amendment to be signed by , a duly authorized officer of the Corporation, on , 2019.

GTX, INC.

By: _____
Name:
Title:

Annex E

CERTIFICATE OF AMENDMENT

TO THE

RESTATED CERTIFICATE OF INCORPORATION

OF

GTX, INC.

GTx, Inc. (the "***Corporation***"), a corporation organized and existing under and by virtue of the General Corporation Law of the State of Delaware, as amended (the "***DGCL***"), hereby certifies as follows:

A. The name of the Corporation is GTx, Inc. The date of filing of the original Certificate of Incorporation of the Corporation with the Secretary of State of the State of Delaware was September 4, 2003, as restated on February 6, 2004.

B. This Certificate of Amendment to the Restated Certificate of Incorporation (the "***Certificate of Amendment***") amends the Corporation's Restated Certificate of Incorporation filed with the Secretary of State of the State of Delaware on February 6, 2004 (the "***Prior Certificate***"), and has been duly adopted by the Corporation's Board of Directors and stockholders in accordance with the provisions of Section 242 of the DGCL.

C. Article I of the Prior Certificate is hereby amended and restated to read in its entirety as follows:

"**ARTICLE I**

"The name of the corporation is Oncternal Therapeutics, Inc. (the "**Corporation**")."

D. The Certificate of Amendment of the Prior Certificate so adopted reads in full as set forth above and is hereby incorporated by reference. All other provisions of the Prior Certificate remain in full force and effect.

IN WITNESS WHEREOF, GTx, Inc. has caused this Certificate of Amendment to be signed by , a duly authorized officer of the Corporation, on , 2019.

GTX, INC.

By: _____
Name:
Title:

Annex F

GTX, INC.

2019 INCENTIVE AWARD PLAN

*The numbers in this Plan do not give effect to the reverse stock split to be consummated prior to the consummation of the transactions contemplated by the Merger Agreement (as defined below) (the "**Reverse Stock Split**") and will be adjusted in connection with such Reverse Stock Split.*

ARTICLE I.
PURPOSE

The Plan's purpose is to enhance the Company's ability to attract, retain and motivate persons who make (or are expected to make) important contributions to the Company by providing these individuals with equity ownership opportunities. Capitalized terms used in the Plan are defined in Article XI.

ARTICLE II.
ELIGIBILITY

Service Providers are eligible to be granted Awards under the Plan, subject to the limitations described herein.

ARTICLE III.
ADMINISTRATION AND DELEGATION

3.1 Administration. The Plan is administered by the Administrator. The Administrator has authority to determine which Service Providers receive Awards, grant Awards and set Award terms and conditions, subject to the conditions and limitations in the Plan. The Administrator also has the authority to take all actions and make all determinations under the Plan, to interpret the Plan and Award Agreements and to adopt, amend and repeal Plan administrative rules, guidelines and practices as it deems advisable. The Administrator may correct defects and ambiguities, supply omissions and reconcile inconsistencies in the Plan or any Award as it deems necessary or appropriate to administer the Plan and any Awards. The Administrator's determinations under the Plan are in its sole discretion and will be final and binding on all persons having or claiming any interest in the Plan or any Award.

3.2 Appointment of Committees. To the extent Applicable Laws permit, the Board may delegate any or all of its powers under the Plan to one or more Committees or officers of the Company or any of its Subsidiaries. The Board may abolish any Committee or re-vest in itself any previously delegated authority at any time.

ARTICLE IV.
STOCK AVAILABLE FOR AWARDS

4.1 Number of Shares. Subject to adjustment under Article VIII and the terms of this Article IV, Awards may be made under the Plan covering up to the Overall Share Limit. As of the Effective Date, the Company will cease granting awards under the Prior Plan; however, Prior Plan Awards will remain subject to the terms of the applicable Prior Plan. Shares issued under the Plan may consist of authorized but unissued Shares, Shares purchased on the open market or treasury Shares.

4.2 Share Recycling. If all or any part of an Award or Prior Plan Award expires, lapses or is terminated, exchanged for cash, surrendered, repurchased, canceled without having been fully exercised or forfeited, in any case, in a manner that results in the Company acquiring Shares covered by the Award or Prior Plan Award at a price not greater than the price (as adjusted to reflect any Equity Restructuring) paid by the Participant for such Shares or not issuing any Shares covered by the Award or Prior Plan Award, the unused Shares covered by the Award or Prior Plan Award will, as applicable, become or again be available for Award grants under the Plan. Further, Shares delivered (either by actual delivery or attestation) to the Company by a Participant to satisfy the applicable exercise or purchase price of an Award or Prior Plan Award and/or to satisfy any applicable tax withholding obligation (including Shares retained by the Company from the Award or Prior Plan Award being exercised or purchased and/or creating the tax obligation) will, as applicable, become or again be available for Award grants under the Plan. The payment of Dividend Equivalents in cash in conjunction with any outstanding Awards or Prior Plan Awards shall not count against the Overall Share Limit.

4.3 Incentive Stock Option Limitations. Notwithstanding anything to the contrary herein, no more than Shares may be issued pursuant to the exercise of Incentive Stock Options.

4.4 Substitute Awards. In connection with an entity's merger or consolidation with the Company or the Company's acquisition of an entity's property or stock, the Administrator may grant Awards in substitution for any Options or other stock or stock-based awards granted before such merger or consolidation by such entity or its affiliate. Substitute Awards may be granted on such terms as the Administrator deems appropriate, notwithstanding limitations on Awards in the Plan. Substitute Awards will not count against the Overall Share Limit (nor shall Shares subject to a Substitute Award be added to the Shares available for Awards under the Plan as provided above), except that Shares acquired by exercise of substitute Incentive Stock Options will count against the maximum number of Shares that may be issued pursuant to the exercise of Incentive Stock Options under the Plan. Additionally, in the event that a company acquired by the Company or any Subsidiary or with which the Company or any Subsidiary combines has shares available under a pre-existing plan approved by stockholders and not adopted in contemplation of such acquisition or combination, the shares available for grant pursuant to the terms of such pre-existing plan (as adjusted, to the extent appropriate, using the exchange ratio or other adjustment or valuation ratio or formula used in such acquisition or combination to determine the consideration payable to the holders of common stock of the entities party to such acquisition or combination) may be used for Awards under the Plan and shall not reduce the Shares authorized for grant under the Plan (and Shares subject to such Awards shall not be added to the Shares available for Awards under the Plan as provided above); provided that Awards using such available shares shall not be made after the date awards or grants could have been made under the terms of the pre-existing plan, absent the acquisition or combination, and shall only be made to individuals who were not Employees or Directors prior to such acquisition or combination.

4.5 Non-Employee Director Compensation. Notwithstanding any provision to the contrary in the Plan, the Administrator may establish compensation for non-employee Directors from time to time, subject to the limitations in the Plan. The Administrator will from time to time determine the terms, conditions and amounts of all such non-employee Director compensation in its discretion and pursuant to the exercise of its business judgment, taking into account such factors, circumstances and considerations as it shall deem relevant from time to time, provided that the sum of any cash compensation, or other compensation, and the value (determined as of the grant date in accordance with Financial Accounting Standards Board Accounting Standards Codification Topic 718, or any successor thereto) of Awards granted to a non-employee Director as compensation for services as a non-employee Director during any fiscal year of the Company may not exceed $750,000 increased to $1,000,000 in the fiscal year of a non-employee Director's initial service as a non-employee Director. The Administrator may make exceptions to this limit for individual non-employee Directors in extraordinary circumstances, as the Administrator may determine in its discretion, provided that the non-employee Director receiving such additional compensation may not participate in the decision to award such compensation or in other contemporaneous compensation decisions involving non-employee Directors.

ARTICLE V.
STOCK OPTIONS AND STOCK APPRECIATION RIGHTS

5.1 General. The Administrator may grant Options or Stock Appreciation Rights to Service Providers subject to the limitations in the Plan, including any limitations in the Plan that apply to Incentive Stock Options. The Administrator will determine the number of Shares covered by each Option and Stock Appreciation Right, the exercise price of each Option and Stock Appreciation Right and the conditions and limitations applicable to the exercise of each Option and Stock Appreciation Right. A Stock Appreciation Right will entitle the Participant (or other person entitled to exercise the Stock Appreciation Right) to receive from the Company upon exercise of the exercisable portion of the Stock Appreciation Right an amount determined by multiplying the excess, if any, of the Fair Market Value of one Share on the date of exercise over the exercise price per Share of the Stock Appreciation Right by the number of Shares with respect to which the Stock Appreciation Right is exercised, subject to any limitations of the Plan or that the Administrator may impose and payable in cash, Shares valued at Fair Market Value or a combination of the two as the Administrator may determine or provide in the Award Agreement.

5.2 Exercise Price. The Administrator will establish each Option's and Stock Appreciation Right's exercise price and specify the exercise price in the Award Agreement. The exercise price will not be less than 100% of the Fair Market Value on the grant date of the Option or Stock Appreciation Right.

5.3 Duration. Each Option or Stock Appreciation Right will be exercisable at such times and as specified in the Award Agreement, provided that the term of an Option or Stock Appreciation Right will not exceed ten (10) years. Notwithstanding the foregoing and unless determined otherwise by the Company, in the event that on the last business day of the term of an Option or Stock Appreciation Right (other than an Incentive Stock Option) (i) the exercise of the Option or Stock Appreciation Right is prohibited by Applicable Law, as determined by the Company, or (ii) Shares may not be purchased or sold by the applicable Participant due to any Company insider trading policy (including blackout periods) or a "lock-up" agreement undertaken in connection with an issuance of securities by the Company, the term of the Option or Stock Appreciation Right shall be extended until the date that is thirty (30) days after the end of the legal prohibition, black-out period or lock-up agreement, as determined by the Company; provided, however, in no event shall the extension last beyond the ten- (10)-year term of the applicable Option or Stock Appreciation Right. Notwithstanding the foregoing, if the Participant, prior to the end of the term of an Option or Stock Appreciation Right, violates the non-competition, non-solicitation, confidentiality or other similar restrictive covenant provisions of any employment contract, confidentiality and nondisclosure agreement or other agreement between the Participant and the Company or any of its Subsidiaries, the right of the Participant and the Participant's transferees to exercise any Option or Stock Appreciation Right issued to the Participant shall terminate immediately upon such violation, unless the Company otherwise determines. In addition, if, prior to the end of the term of an Option or Stock Appreciation Right, the Participant is given notice by the Company or any of its Subsidiaries of the Participant's Termination of Service by the Company or any of its Subsidiaries for Cause, and the effective date of such Termination of Service is subsequent to the date of the delivery of such notice, the right of the Participant and the Participant's transferees to exercise any Option or Stock Appreciation Right issued to the Participant shall be suspended from the time of the delivery of such notice until the earlier of (i) such time as it is determined or otherwise agreed that the Participant's service as a Service Provider will not be terminated for Cause as provided in such notice or (ii) the effective date of the Participant's Termination of Service by the Company or any of its Subsidiaries for Cause (in which case the right of the Participant and the Participant's transferees to exercise any Option or Stock Appreciation Right issued to the Participant will terminate immediately upon the effective date of such Termination of Service).

5.4 Exercise. Options and Stock Appreciation Rights may be exercised by delivering to the Company a written notice of exercise, in a form the Administrator approves (which may be electronic), signed by the person authorized to exercise the Option or Stock Appreciation Right, together with, as applicable, payment in full (i) as specified in Section 5.5 for the number of Shares for which the Award is exercised and (ii) as specified in

Section 9.5 for any applicable taxes. Unless the Administrator otherwise determines, an Option or Stock Appreciation Right may not be exercised for a fraction of a Share.

5.5 Payment Upon Exercise. Subject to any Company insider trading policy (including blackout periods) and Applicable Laws, the exercise price of an Option must be paid by:

(a) cash, wire transfer of immediately available funds or by check payable to the order of the Company, provided that the Company may limit the use of one of the foregoing payment forms if one or more of the payment forms below is permitted;

(b) if there is a public market for Shares at the time of exercise, unless the Company otherwise determines, (A) delivery (including electronically or telephonically to the extent permitted by the Company) of an irrevocable and unconditional undertaking by a broker acceptable to the Company to deliver promptly to the Company sufficient funds to pay the exercise price, or (B) the Participant's delivery to the Company of a copy of irrevocable and unconditional instructions to a broker acceptable to the Company to deliver promptly to the Company cash or a check sufficient to pay the exercise price; provided that such amount is paid to the Company at such time as may be required by the Administrator;

(c) to the extent permitted by the Administrator, delivery (either by actual delivery or attestation) of Shares owned by the Participant valued at their Fair Market Value;

(d) to the extent permitted by the Administrator, surrendering Shares then issuable upon the Option's exercise valued at their Fair Market Value on the exercise date;

(e) to the extent permitted by the Administrator, delivery of a promissory note or any other property that the Administrator determines is good and valuable consideration; or

(f) to the extent permitted by the Company, any combination of the above payment forms approved by the Administrator.

ARTICLE VI.
RESTRICTED STOCK; RESTRICTED STOCK UNITS

6.1 General. The Administrator may grant Restricted Stock, or the right to purchase Restricted Stock, to any Service Provider, subject to the Company's right to repurchase all or part of such Shares at their issue price or other stated or formula price from the Participant (or to require forfeiture of such Shares) if conditions the Administrator specifies in the Award Agreement are not satisfied before the end of the applicable restriction period or periods that the Administrator establishes for such Award. In addition, the Administrator may grant to Service Providers Restricted Stock Units, which may be subject to vesting and forfeiture conditions during the applicable restriction period or periods, as set forth in an Award Agreement. The Administrator will determine and set forth in the Award Agreement the terms and conditions for each Restricted Stock and Restricted Stock Unit Award, subject to the conditions and limitations contained in the Plan.

6.2 Restricted Stock.

(a) Dividends. Participants holding Shares of Restricted Stock will be entitled to all ordinary cash dividends paid with respect to such Shares, unless the Administrator provides otherwise in the Award Agreement. In addition, unless the Administrator provides otherwise, if any dividends or distributions are paid in Shares, or consist of a dividend or distribution to holders of Common Stock of property other than an ordinary cash dividend, the Shares or other property will be subject to the same restrictions on transferability and forfeitability as the Shares of Restricted Stock with respect to which they were paid.

(b) Stock Certificates. The Company may require that the Participant deposit in escrow with the Company (or its designee) any stock certificates issued in respect of Shares of Restricted Stock, together with a stock power endorsed in blank.

6.3 Restricted Stock Units.

(a) Settlement. The Administrator may provide that settlement of Restricted Stock Units will occur upon or as soon as reasonably practicable after the Restricted Stock Units vest or will instead be deferred, on a mandatory basis or at the Participant's election, in a manner intended to comply with Section 409A.

(b) Stockholder Rights. A Participant will have no rights of a stockholder with respect to Shares subject to any Restricted Stock Unit unless and until the Shares are delivered in settlement of the Restricted Stock Unit.

(c) Dividend Equivalents. If the Administrator provides, a grant of Restricted Stock Units may provide a Participant with the right to receive Dividend Equivalents. Dividend Equivalents may be paid currently or credited to an account for the Participant, settled in cash or Shares and subject to the same restrictions on transferability and forfeitability as the Restricted Stock Units with respect to which the Dividend Equivalents are granted and subject to other terms and conditions as set forth in the Award Agreement.

ARTICLE VII.
OTHER STOCK OR CASH BASED AWARDS

Other Stock or Cash Based Awards may be granted to Participants, including Awards entitling Participants to receive Shares to be delivered in the future and including annual or other periodic or long-term cash bonus awards (whether based on specified Performance Criteria or otherwise), in each case subject to any conditions and limitations in the Plan. Such Other Stock or Cash Based Awards will also be available as a payment form in the settlement of other Awards, as standalone payments and as payment in lieu of compensation to which a Participant is otherwise entitled. Other Stock or Cash Based Awards may be paid in Shares, cash or other property, as the Administrator determines. Subject to the provisions of the Plan, the Administrator will determine the terms and conditions of each Other Stock or Cash Based Award, including any purchase price, performance goal (which may be based on the Performance Criteria), transfer restrictions, and vesting conditions, which will be set forth in the applicable Award Agreement.

ARTICLE VIII.
ADJUSTMENTS FOR CHANGES IN COMMON STOCK AND CERTAIN OTHER EVENTS

8.1 Equity Restructuring. In connection with any Equity Restructuring, notwithstanding anything to the contrary in this Article VIII, the Administrator will equitably adjust each outstanding Award as it deems appropriate to reflect the Equity Restructuring, which may include adjusting the number and type of securities subject to each outstanding Award and/or the Award's exercise price or grant price (if applicable), granting new Awards to Participants, and making a cash payment to Participants. The adjustments provided under this Section 8.1 will be nondiscretionary and final and binding on the affected Participant and the Company; provided that the Administrator will determine whether an adjustment is equitable.

8.2 Corporate Transactions. In the event of any dividend or other distribution (whether in the form of cash, Common Stock, other securities, or other property), reorganization, merger, consolidation, combination, amalgamation, repurchase, recapitalization, liquidation, dissolution, or sale, transfer, exchange or other disposition of all or substantially all of the assets of the Company, or sale or exchange of Common Stock or other securities of the Company, Change in Control, issuance of warrants or other rights to purchase Common Stock or

other securities of the Company, other similar corporate transaction or event, other unusual or nonrecurring transaction or event affecting the Company or its financial statements or any change in any Applicable Laws or accounting principles, the Administrator, on such terms and conditions as it deems appropriate, either by the terms of the Award or by action taken prior to the occurrence of such transaction or event (except that action to give effect to a change in Applicable Law or accounting principles may be made within a reasonable period of time after such change) and either automatically or upon the Participant's request, is hereby authorized to take any one or more of the following actions whenever the Administrator determines that such action is appropriate in order to (x) prevent dilution or enlargement of the benefits or potential benefits intended by the Company to be made available under the Plan or with respect to any Award granted or issued under the Plan, (y) to facilitate such transaction or event or (z) give effect to such changes in Applicable Laws or accounting principles:

(a) To provide for the cancellation of any such Award in exchange for either an amount of cash or other property with a value equal to the amount that could have been obtained upon the exercise or settlement of the vested portion of such Award or realization of the Participant's rights under the vested portion of such Award, as applicable; provided that, if the amount that could have been obtained upon the exercise or settlement of the vested portion of such Award or realization of the Participant's rights, in any case, is equal to or less than zero, then the Award may be terminated without payment;

(b) To provide that such Award shall vest and, to the extent applicable, be exercisable as to all Shares covered thereby, notwithstanding anything to the contrary in the Plan or the provisions of such Award;

(c) To provide that such Award be assumed by the successor or survivor corporation, or a parent or subsidiary thereof, or shall be substituted for by awards covering the stock of the successor or survivor corporation, or a parent or subsidiary thereof, with appropriate adjustments as to the number and kind of Shares and/or applicable exercise or purchase price, in all cases, as determined by the Administrator;

(d) To make adjustments in the number and type of Shares (or other securities or property) subject to outstanding Awards and/or with respect to which Awards may be granted under the Plan (including, but not limited to, adjustments of the limitations in Article IV hereof on the maximum number and kind of Shares which may be issued) and/or in the terms and conditions of (including the grant or exercise price), and the criteria included in, outstanding Awards;

(e) To replace such Award with other rights or property selected by the Administrator; and/or

(f) To provide that the Award will terminate and cannot vest, be exercised or become payable after the applicable event.

8.3 Effect of Non-Assumption in a Change in Control. Notwithstanding the provisions of Section 8.2 above, if a Change in Control occurs and a Participant's Awards are not continued, converted, assumed, or replaced with a substantially similar award by (a) the Company, or (b) a Successor Entity (as defined below) or its parent or subsidiary (an "***Assumption***"), and provided that the Participant has not had a Termination of Service, then, immediately prior to the Change in Control, such Awards shall become fully vested, exercisable and/or payable, as applicable, and all forfeiture, repurchase and other restrictions on such Awards shall lapse, in which case, such Awards shall be canceled upon the consummation of the Change in Control in exchange for the right to receive the Change in Control consideration payable to other holders of Common Stock (i) which may be on such terms and conditions as apply generally to holders of Common Stock under the Change in Control documents (including, without limitation, any escrow, earn-out or other deferred consideration provisions) or such other terms and conditions as the Administrator may provide, and (ii) determined by reference to the number of Shares subject to such Awards and net of any applicable exercise price; provided that to the extent that any Awards constitute "nonqualified deferred compensation" that may not be paid upon the Change in Control under Section 409A without the imposition of taxes thereon under Section 409A, the timing of such payments shall be governed by the applicable Award Agreement (subject to any deferred consideration provisions

applicable under the Change in Control documents); and provided, further, that if the amount to which a Participant would be entitled upon the settlement or exercise of such Award at the time of the Change in Control is equal to or less than zero, then such Award may be terminated without payment. The Administrator shall determine whether an Assumption of an Award has occurred in connection with a Change in Control.

8.4 Administrative Stand Still. In the event of any pending stock dividend, stock split, combination or exchange of Shares, merger, consolidation or other distribution (other than normal cash dividends) of Company assets to stockholders, or any other extraordinary transaction or change affecting the Shares or the share price of Common Stock, including any Equity Restructuring or any securities offering or other similar transaction, for administrative convenience, the Administrator may refuse to permit the exercise of any Award for up to sixty (60) days before or after such transaction.

8.5 General. Except as expressly provided in the Plan or the Administrator's action under the Plan, no Participant will have any rights due to any subdivision or consolidation of Shares of any class, dividend payment, increase or decrease in the number of Shares of any class or dissolution, liquidation, merger, or consolidation of the Company or other corporation. Except as expressly provided with respect to an Equity Restructuring under Section 8.1 above or the Administrator's action under the Plan, no issuance by the Company of Shares of any class, or securities convertible into Shares of any class, will affect, and no adjustment will be made regarding, the number of Shares subject to an Award or the Award's grant or exercise price. The existence of the Plan, any Award Agreements and the Awards granted hereunder will not affect or restrict in any way the Company's right or power to make or authorize (i) any adjustment, recapitalization, reorganization or other change in the Company's capital structure or its business, (ii) any merger, consolidation dissolution or liquidation of the Company or sale of Company assets or (iii) any sale or issuance of securities, including securities with rights superior to those of the Shares or securities convertible into or exchangeable for Shares. The Administrator may treat Participants and Awards (or portions thereof) differently under this Article VIII.

ARTICLE IX.
GENERAL PROVISIONS APPLICABLE TO AWARDS

9.1 Transferability. Except as the Administrator may determine or provide in an Award Agreement or otherwise for Awards other than Incentive Stock Options, Awards may not be sold, assigned, transferred, pledged or otherwise encumbered, either voluntarily or by operation of law, except by will or the laws of descent and distribution, or, subject to the Administrator's consent, pursuant to a domestic relations order, and, during the life of the Participant, will be exercisable only by the Participant. References to a Participant, to the extent relevant in the context, will include references to a Participant's authorized transferee that the Administrator specifically approves.

9.2 Documentation. Each Award will be evidenced in an Award Agreement, which may be written or electronic, as the Administrator determines. Each Award may contain terms and conditions in addition to those set forth in the Plan.

9.3 Discretion. Except as the Plan otherwise provides, each Award may be made alone or in addition or in relation to any other Award. The terms of each Award to a Participant need not be identical, and the Administrator need not treat Participants or Awards (or portions thereof) uniformly.

9.4 Termination of Status. The Administrator will determine how the disability, death, retirement, authorized leave of absence or any other change or purported change in a Participant's Service Provider status affects an Award and the extent to which, and the period during which, the Participant, the Participant's legal representative, conservator, guardian or Designated Beneficiary may exercise rights under the Award, if applicable.

9.5 Withholding. Each Participant must pay the Company, or make provision satisfactory to the Administrator for payment of, any taxes required by law to be withheld in connection with such Participant's Awards by the date of the event creating the tax liability. The Company may deduct an amount sufficient to satisfy such tax obligations based on the applicable statutory withholding rates (or such other rate as may be determined by the Company after considering any accounting consequences or costs) from any payment of any kind otherwise due to a Participant. In the absence of a contrary determination by the Company (or, with respect to withholding pursuant to clause (ii) below with respect to Awards held by individuals subject to Section 16 of the Exchange Act, a contrary determination by the Administrator), all tax withholding obligations will be calculated based on the minimum applicable statutory withholding rates. Subject to any Company insider trading policy (including blackout periods), Participants may satisfy such tax obligations (i) in cash, by wire transfer of immediately available funds, by check made payable to the order of the Company, provided that the Company may limit the use of the foregoing payment forms if one or more of the payment forms below is permitted, (ii) to the extent permitted by the Administrator, in whole or in part by delivery of Shares, including Shares delivered by attestation and Shares retained from the Award creating the tax obligation, valued at their Fair Market Value on the date of delivery, (iii) if there is a public market for Shares at the time the tax obligations are satisfied, unless the Company otherwise determines, (A) delivery (including electronically or telephonically to the extent permitted by the Company) of an irrevocable and unconditional undertaking by a broker acceptable to the Company to deliver promptly to the Company sufficient funds to satisfy the tax obligations, or (B) delivery by the Participant to the Company of a copy of irrevocable and unconditional instructions to a broker acceptable to the Company to deliver promptly to the Company cash or a check sufficient to satisfy the tax withholding; provided that such amount is paid to the Company at such time as may be required by the Administrator, or (iv) to the extent permitted by the Company, any combination of the foregoing payment forms approved by the Administrator. Notwithstanding any other provision of the Plan, the number of Shares which may be so delivered or retained pursuant to clause (ii) of the immediately preceding sentence shall be limited to the number of Shares which have a Fair Market Value on the date of delivery or retention no greater than the aggregate amount of such liabilities based on the maximum individual statutory tax rate in the applicable jurisdiction at the time of such withholding (or such other rate as may be required to avoid the liability classification of the applicable award under generally accepted accounting principles in the United States of America); provided, however, to the extent such Shares were acquired by Participant from the Company as compensation, the Shares must have been held for the minimum period required by applicable accounting rules to avoid a charge to the Company's earnings for financial reporting purposes; provided, further, that, any such Shares delivered or retained shall be rounded up to the nearest whole Share to the extent rounding up to the nearest whole Share does not result in the liability classification of the applicable Award under generally accepted accounting principles in the United States of America. If any tax withholding obligation will be satisfied under clause (ii) above by the Company's retention of Shares from the Award creating the tax obligation and there is a public market for Shares at the time the tax obligation is satisfied, the Company may elect to instruct any brokerage firm determined acceptable to the Company for such purpose to sell on the applicable Participant's behalf some or all of the Shares retained and to remit the proceeds of the sale to the Company or its designee, and each Participant's acceptance of an Award under the Plan will constitute the Participant's authorization to the Company and instruction and authorization to such brokerage firm to complete the transactions described in this sentence.

9.6 Amendment of Award; Repricing. The Administrator may amend, modify or terminate any outstanding Award, including by substituting another Award of the same or a different type, changing the exercise or settlement date, and converting an Incentive Stock Option to a Non-Qualified Stock Option. The Participant's consent to such action will be required unless (i) the action, taking into account any related action, does not materially and adversely affect the Participant's rights under the Award, or (ii) the change is permitted under Article VIII or pursuant to Section 10.6. Notwithstanding the foregoing or anything in the Plan to the contrary, the Administrator may, without the approval of the stockholders of the Company, reduce the exercise price per share of outstanding Options or Stock Appreciation Rights or cancel outstanding Options or Stock Appreciation Rights in exchange for cash, other Awards or Options or Stock Appreciation Rights with an exercise price per share that is less than the exercise price per share of the original Options or Stock Appreciation Rights.

9.7 Conditions on Delivery of Stock. The Company will not be obligated to deliver any Shares under the Plan or remove restrictions from Shares previously delivered under the Plan until (i) all Award conditions have been met or removed to the Company's satisfaction, (ii) as determined by the Company, all other legal matters regarding the issuance and delivery of such Shares have been satisfied, including any applicable securities laws and stock exchange or stock market rules and regulations, and (iii) the Participant has executed and delivered to the Company such representations or agreements as the Administrator deems necessary or appropriate to satisfy any Applicable Laws. The Company's inability to obtain authority from any regulatory body having jurisdiction, which the Administrator determines is necessary to the lawful issuance and sale of any securities, will relieve the Company of any liability for failing to issue or sell such Shares as to which such requisite authority has not been obtained.

9.8 Acceleration. The Administrator may at any time provide that any Award will become immediately vested and fully or partially exercisable, free of some or all restrictions or conditions, or otherwise fully or partially realizable.

9.9 Additional Terms of Incentive Stock Options. The Administrator may grant Incentive Stock Options only to employees of the Company, any of its present or future parent or subsidiary corporations, as defined in Sections 424(e) or (f) of the Code, respectively, and any other entities the employees of which are eligible to receive Incentive Stock Options under the Code. If an Incentive Stock Option is granted to a Greater Than 10% Stockholder, the exercise price will not be less than 110% of the Fair Market Value on the Option's grant date, and the term of the Option will not exceed five (5) years. All Incentive Stock Options will be subject to and construed consistently with Section 422 of the Code. By accepting an Incentive Stock Option, the Participant agrees to give prompt notice to the Company of dispositions or other transfers (other than in connection with a Change in Control) of Shares acquired under the Option made within (i) two years from the grant date of the Option or (ii) one year after the transfer of such Shares to the Participant, specifying the date of the disposition or other transfer and the amount the Participant realized, in cash, other property, assumption of indebtedness or other consideration, in such disposition or other transfer. Neither the Company nor the Administrator will be liable to a Participant, or any other party, if an Incentive Stock Option fails or ceases to qualify as an "incentive stock option" under Section 422 of the Code. Any Incentive Stock Option or portion thereof that fails to qualify as an "incentive stock option" under Section 422 of the Code for any reason, including becoming exercisable with respect to Shares having a Fair Market Value exceeding the $100,000 limitation under Treasury Regulation Section 1.422-4, will be a Non-Qualified Stock Option.

ARTICLE X.
MISCELLANEOUS

10.1 No Right to Employment or Other Status. No person will have any claim or right to be granted an Award, and the grant of an Award will not be construed as giving a Participant the right to continued employment or any other relationship with the Company. The Company expressly reserves the right at any time to dismiss or otherwise terminate its relationship with a Participant free from any liability or claim under the Plan or any Award, except as expressly provided in an Award Agreement.

10.2 No Rights as Stockholder; Certificates. Subject to the Award Agreement, no Participant or Designated Beneficiary will have any rights as a stockholder with respect to any Shares to be distributed under an Award until becoming the record holder of such Shares. Notwithstanding any other provision of the Plan, unless the Administrator otherwise determines or Applicable Laws require, the Company will not be required to deliver to any Participant certificates evidencing Shares issued in connection with any Award and instead such Shares may be recorded in the books of the Company (or, as applicable, its transfer agent or stock plan administrator). The Company may place legends on stock certificates issued under the Plan that the Administrator deems necessary or appropriate to comply with Applicable Laws.

10.3 Effective Date and Term of Plan. The Plan was approved by the Board on , 2019. The Plan shall be effective (the "***Effective Date***") on the day prior to the date of the closing of the transactions contemplated by that certain Agreement and Plan of Merger and Reorganization, dated as of March 6, 2019 by and among the Company, Grizzly Merger Sub, Inc. and Oncternal Therapeutics, Inc. (the "***Merger Agreement***"), provided that it is approved by a majority of the Company's stockholders at a duly held meeting prior to such date and occurring within twelve (12) months following the date the Board approved Plan, and provided further that the effectiveness of the Plan is subject to the consummation of the transactions contemplated by the Merger Agreement. If the Plan is not approved by the Company's stockholders within the foregoing time frame, or if the Merger Agreement is terminated prior to the consummation of the transactions contemplated thereby, the Plan will not become effective. The Plan shall remain in effect until the tenth (10^{th}) anniversary of the date the Board adopted the Plan, but Awards previously granted may extend beyond that date in accordance with the Plan. The Plan will be submitted for approval of the Company's stockholders within twelve (2) months following the date the Board approved the Plan.

10.4 Amendment of Plan. The Administrator may amend, suspend or terminate the Plan at any time; provided that no amendment, other than an increase to the Overall Share Limit, may materially and adversely affect any Award outstanding at the time of such amendment without the affected Participant's consent. No Awards may be granted under the Plan during any suspension period or after the Plan's termination. Awards outstanding at the time of any Plan suspension or termination will continue to be governed by the Plan and the Award Agreement, as in effect before such suspension or termination. The Board will obtain stockholder approval of any Plan amendment to the extent necessary to comply with Applicable Laws.

10.5 Provisions for Foreign Participants. The Administrator may modify Awards granted to Participants who are foreign nationals or employed outside the United States or establish subplans or procedures under the Plan to address differences in laws, rules, regulations or customs of such foreign jurisdictions with respect to tax, securities, currency, employee benefit or other matters.

10.6 Section 409A.

(a) General. The Company intends that all Awards be structured to comply with, or be exempt from, Section 409A, such that no adverse tax consequences, interest, or penalties under Section 409A apply. Notwithstanding anything in the Plan or any Award Agreement to the contrary, the Administrator may, without a Participant's consent, amend this Plan or Awards, adopt policies and procedures, or take any other actions (including amendments, policies, procedures and retroactive actions) as are necessary or appropriate to preserve the intended tax treatment of Awards, including any such actions intended to (A) exempt this Plan or any Award from Section 409A, or (B) comply with Section 409A, including regulations, guidance, compliance programs and other interpretative authority that may be issued after an Award's grant date. The Company makes no representations or warranties as to an Award's tax treatment under Section 409A or otherwise. The Company will have no obligation under this Section 10.6 or otherwise to avoid the taxes, penalties or interest under Section 409A with respect to any Award and will have no liability to any Participant or any other person if any Award, compensation or other benefits under the Plan are determined to constitute noncompliant "nonqualified deferred compensation" subject to taxes, penalties or interest under Section 409A.

(b) Separation from Service. If an Award constitutes "nonqualified deferred compensation" under Section 409A, any payment or settlement of such Award upon a termination of a Participant's Service Provider relationship will, to the extent necessary to avoid taxes under Section 409A, be made only upon the Participant's "separation from service" (within the meaning of Section 409A), whether such "separation from service" occurs upon or after the termination of the Participant's Service Provider relationship. For purposes of this Plan or any Award Agreement relating to any such payments or benefits, references to a "termination," "termination of employment" or like terms means a "separation from service."

(c) Payments to Specified Employees. Notwithstanding any contrary provision in the Plan or any Award Agreement, any payment(s) of "nonqualified deferred compensation" required to be made under an

Award to a "specified employee" (as defined under Section 409A and as the Administrator determines) due to his or her "separation from service" will, to the extent necessary to avoid taxes under Section 409A(a)(2)(B)(i) of the Code, be delayed for the six- (6)-month period immediately following such "separation from service" (or, if earlier, until the specified Employee's death) and will instead be paid (as set forth in the Award Agreement) on the day immediately following such six- (6)month period or as soon as administratively practicable thereafter (without interest). Any payments of "nonqualified deferred compensation" under such Award payable more than six (6) months following the Participant's "separation from service" will be paid at the time or times the payments are otherwise scheduled to be made.

10.7 Limitations on Liability. Notwithstanding any other provisions of the Plan, no individual acting as a director, officer, other Employee or agent of the Company or any Subsidiary will be liable to any Participant, former Participant, spouse, beneficiary, or any other person for any claim, loss, liability, or expense incurred in connection with the Plan or any Award, and such individual will not be personally liable with respect to the Plan because of any contract or other instrument executed in his or her capacity as an Administrator, director, officer, other Employee or agent of the Company or any Subsidiary. The Company will indemnify and hold harmless each director, officer, other Employee and agent of the Company or any Subsidiary that has been or will be granted or delegated any duty or power relating to the Plan's administration or interpretation, against any cost or expense (including attorneys' fees) or liability (including any sum paid in settlement of a claim with the Administrator's approval) arising from any act or omission concerning this Plan unless arising from such person's own fraud or bad faith.

10.9 Data Privacy. As a condition for receiving any Award, each Participant explicitly and unambiguously consents to the collection, use and transfer, in electronic or other form, of personal data as described in this section by and among the Company and its Subsidiaries and affiliates exclusively for implementing, administering and managing the Participant's participation in the Plan. The Company and its Subsidiaries and affiliates may hold certain personal information about a Participant, including the Participant's name, address and telephone number; birthdate; social security, insurance number or other identification number; salary; nationality; job title(s); any Shares held in the Company or its Subsidiaries and affiliates; and Award details, to implement, manage and administer the Plan and Awards (the "***Data***"). The Company and its Subsidiaries and affiliates may transfer the Data amongst themselves as necessary to implement, administer and manage a Participant's participation in the Plan, and the Company and its Subsidiaries and affiliates may transfer the Data to third parties assisting the Company with Plan implementation, administration and management. These recipients may be located in the Participant's country, or elsewhere, and the Participant's country may have different data privacy laws and protections than the recipients' country. By accepting an Award, each Participant authorizes such recipients to receive, possess, use, retain and transfer the Data, in electronic or other form, to implement, administer and manage the Participant's participation in the Plan, including any required Data transfer to a broker or other third party with whom the Company or the Participant may elect to deposit any Shares. The Data related to a Participant will be held only as long as necessary to implement, administer, and manage the Participant's participation in the Plan. A Participant may, at any time, view the Data that the Company holds regarding such Participant, request additional information about the storage and processing of the Data regarding such Participant, recommend any necessary corrections to the Data regarding the Participant or refuse or withdraw the consents in this Section 10.8 in writing, without cost, by contacting the local human resources representative. The Company may cancel Participant's ability to participate in the Plan and, in the Administrator's discretion, the Participant may forfeit any outstanding Awards if the Participant refuses or withdraws the consents in this Section 10.8. For more information on the consequences of refusing or withdrawing consent, Participants may contact their local human resources representative.

10.10 Severability. If any portion of the Plan or any action taken under it is held illegal or invalid for any reason, the illegality or invalidity will not affect the remaining parts of the Plan, and the Plan will be construed and enforced as if the illegal or invalid provisions had been excluded, and the illegal or invalid action will be null and void.

10.11 Governing Documents. If any contradiction occurs between the Plan and any Award Agreement or other written agreement between a Participant and the Company (or any Subsidiary) that the Administrator has approved, the Plan will govern, unless it is expressly specified in such Award Agreement or other written document that a specific provision of the Plan will not apply.

10.12 Governing Law. The Plan and all Awards will be governed by and interpreted in accordance with the laws of the State of Delaware, disregarding any state's choice-of-law principles requiring the application of a jurisdiction's laws other than the State of Delaware.

10.13 Claw-back Provisions. All Awards (including, without limitation, any proceeds, gains or other economic benefit actually or constructively received by Participant upon any receipt or exercise of any Award or upon the receipt or resale of any Shares underlying the Award) shall be subject to the provisions of any claw-back policy implemented by the Company, including, without limitation, any claw-back policy adopted to comply with Applicable Laws (including the Dodd-Frank Wall Street Reform and Consumer Protection Act and any rules or regulations promulgated thereunder) as and to the extent set forth in such claw-back policy or the Award Agreement.

10.14 Titles and Headings. The titles and headings in the Plan are for convenience of reference only and, if any conflict, the Plan's text, rather than such titles or headings, will control.

10.15 Conformity to Securities Laws. Participant acknowledges that the Plan is intended to conform to the extent necessary with Applicable Laws. Notwithstanding anything herein to the contrary, the Plan and all Awards will be administered only in conformance with Applicable Laws. To the extent Applicable Laws permit, the Plan and all Award Agreements will be deemed amended as necessary to conform to Applicable Laws.

10.16 Relationship to Other Benefits. No payment under the Plan will be taken into account in determining any benefits under any pension, retirement, savings, profit sharing, group insurance, welfare or other benefit plan of the Company or any Subsidiary except as expressly provided in writing in such other plan or an agreement thereunder.

10.17 Broker-Assisted Sales. In the event of a broker-assisted sale of Shares in connection with the payment of amounts owed by a Participant under or with respect to the Plan or Awards, including amounts to be paid under the final sentence of Section 9.5: (a) any Shares to be sold through the broker-assisted sale will be sold on the day the payment first becomes due, or as soon thereafter as practicable; (b) such Shares may be sold as part of a block trade with other Participants in the Plan in which all participants receive an average price; (c) the applicable Participant will be responsible for all broker's fees and other costs of sale, and by accepting an Award, each Participant agrees to indemnify and hold the Company harmless from any losses, costs, damages, or expenses relating to any such sale; (d) to the extent the Company or its designee receives proceeds of such sale that exceed the amount owed, the Company will pay such excess in cash to the applicable Participant as soon as reasonably practicable; (e) the Company and its designees are under no obligation to arrange for such sale at any particular price; and (f) in the event the proceeds of such sale are insufficient to satisfy the Participant's applicable obligation, the Participant may be required to pay immediately upon demand to the Company or its designee an amount in cash sufficient to satisfy any remaining portion of the Participant's obligation.

ARTICLE XI.
DEFINITIONS

As used in the Plan, the following words and phrases will have the following meanings:

11.1 "***Administrator***" means the Board or a Committee to the extent that the Board's powers or authority under the Plan have been delegated to such Committee.

11.2 "***Applicable Laws***" means the requirements relating to the administration of equity incentive plans under U.S. federal and state securities, tax and other applicable laws, rules and regulations, the applicable rules of any stock exchange or quotation system on which the Common Stock is listed or quoted and the applicable laws and rules of any foreign country or other jurisdiction where Awards are granted.

11.3 "***Award***" means, individually or collectively, a grant under the Plan of Options, Stock Appreciation Rights, Restricted Stock, Restricted Stock Units or Other Stock or Cash Based Awards.

11.4 "***Award Agreement***" means a written agreement evidencing an Award, which may be electronic, that contains such terms and conditions as the Administrator determines, consistent with and subject to the terms and conditions of the Plan.

11.5 "***Board***" means the Board of Directors of the Company.

11.6 "***Cause***" means (a) if a Participant is a party to a written employment or consulting agreement with the Company or any of its Subsidiaries or an Award Agreement in which the term "cause" is defined, "Cause" as defined in such agreement, and (b) if no such agreement exists, (i) the Administrator's determination that the Participant failed to substantially perform the Participant's duties (other than any such failure resulting from the Participant's Disability); (ii) the Administrator's determination that the Participant failed to carry out, or comply with any lawful and reasonable directive of the Board or the Participant's immediate supervisor; (iii) the occurrence of any act or omission by the Participant that could reasonably be expected to result in (or has resulted in) the Participant's conviction, plea of no contest, plea of nolo contendere, or imposition of unadjudicated probation for any felony or indictable offense or crime involving moral turpitude; (iv) the Participant's unlawful use (including being under the influence) or possession of illegal drugs on the premises of the Company or any of its Subsidiaries or while performing the Participant's duties and responsibilities for the Company or any of its Subsidiaries; or (v) the Participant's commission of an act of fraud, embezzlement, misappropriation, misconduct, or breach of fiduciary duty against the Company or any of its Subsidiaries.

11.7 "***Change in Control***" means and includes each of the following:

(a) A transaction or series of transactions (other than an offering of Common Stock to the general public through a registration statement filed with the Securities and Exchange Commission or a transaction or series of transactions that meets the requirements of clauses (i) and (ii) of subsection (c) below) whereby any "person" or related "group" of "persons" (as such terms are used in Sections 13(d) and 14(d)(2) of the Exchange Act) (other than the Company, any of its Subsidiaries, an employee benefit plan maintained by the Company or any of its Subsidiaries or a "person" that, prior to such transaction, directly or indirectly controls, is controlled by, or is under common control with, the Company) directly or indirectly acquires beneficial ownership (within the meaning of Rule 13d-3 under the Exchange Act) of securities of the Company possessing more than 50% of the total combined voting power of the Company's securities outstanding immediately after such acquisition; or

(b) During any period of two (2) consecutive years, individuals who, at the beginning of such period, constitute the Board together with any new Director(s) (other than a Director designated by a person who shall have entered into an agreement with the Company to effect a transaction described in subsections (a) or (c)) whose election by the Board or nomination for election by the Company's stockholders was approved by a vote of at least two-thirds of the Directors then still in office who either were Directors at the beginning of the two- (2)-year period or whose election or nomination for election was previously so approved, cease for any reason to constitute a majority thereof; or

(c) The consummation by the Company (whether directly involving the Company or indirectly involving the Company through one or more intermediaries) of (x) a merger, consolidation, reorganization, or

business combination or (y) a sale or other disposition of all or substantially all of the Company's assets in any single transaction or series of related transactions or (z) the acquisition of assets or stock of another entity, in each case other than a transaction:

(i) which results in the Company's voting securities outstanding immediately before the transaction continuing to represent (either by remaining outstanding or by being converted into voting securities of the Company or the person that, as a result of the transaction, controls, directly or indirectly, the Company or owns, directly or indirectly, all or substantially all of the Company's assets or otherwise succeeds to the business of the Company (the Company or such person, the "***Successor Entity***")) directly or indirectly, at least a majority of the combined voting power of the Successor Entity's outstanding voting securities immediately after the transaction, and

(ii) after which no person or group beneficially owns voting securities representing 50% or more of the combined voting power of the Successor Entity; provided, however, that no person or group shall be treated for purposes of this clause (ii) as beneficially owning 50% or more of the combined voting power of the Successor Entity solely as a result of the voting power held in the Company prior to the consummation of the transaction.

Notwithstanding the foregoing, (x) the transactions contemplated by the Merger Agreement shall not constitute a Change in Control for purposes of this Plan, and (y) if a Change in Control constitutes a payment event with respect to any Award (or portion of any Award) that provides for the deferral of compensation that is subject to Section 409A, to the extent required to avoid the imposition of additional taxes under Section 409A, the transaction or event described in subsection (a), (b) or (c) with respect to such Award (or portion thereof) shall only constitute a Change in Control for purposes of the payment timing of such Award if such transaction also constitutes a "change in control event," as defined in Treasury Regulation Section 1.409A-3(i)(5).

The Administrator shall have full and final authority, which shall be exercised in its discretion, to determine conclusively whether a Change in Control has occurred pursuant to the above definition, the date of the occurrence of such Change in Control and any incidental matters relating thereto; provided that any exercise of authority in conjunction with a determination of whether a Change in Control is a "change in control event" as defined in Treasury Regulation Section 1.409A-3(i)(5) shall be consistent with such regulation.

11.8 "***Code***" means the Internal Revenue Code of 1986, as amended, and the regulations issued thereunder.

11.9 "***Committee***" means one or more committees or subcommittees of the Board, which may include one or more Company directors or executive officers, to the extent Applicable Laws permit. To the extent required to comply with the provisions of Rule 16b-3, it is intended that each member of the Committee will be, at the time the Committee takes any action with respect to an Award that is subject to Rule 16b-3, a "non-employee director" within the meaning of Rule 16b-3; however, a Committee member's failure to qualify as a "non-employee director" within the meaning of Rule 16b-3 will not invalidate any Award granted by the Committee that is otherwise validly granted under the Plan.

11.10 "***Common Stock***" means the common stock of the Company.

11.11 "***Company***" means GTx, Inc., a Delaware corporation, or any successor.

11.12 "***Consultant***" means any person, including any adviser, engaged by the Company or its parent or Subsidiary to render services to such entity if the consultant or adviser: (a) renders bona fide services to the Company; (b) renders services not in connection with the offer or sale of securities in a capital-raising transaction and does not directly or indirectly promote or maintain a market for the Company's securities; and (c) is a natural person.

11.13 "***Designated Beneficiary***" means the beneficiary or beneficiaries the Participant designates, in a manner the Administrator determines, to receive amounts due or exercise the Participant's rights if the Participant dies or becomes incapacitated. Without a Participant's effective designation, "Designated Beneficiary" will mean the Participant's estate.

11.14 "***Director***" means a Board member.

11.15 "***Disability***" means a permanent and total disability under Section 22(e)(3) of the Code, as amended.

11.16 "***Dividend Equivalents***" means a right granted to a Participant under the Plan to receive the equivalent value (in cash or Shares) of dividends paid on Shares.

11.17 "***Employee***" means any employee of the Company or its Subsidiaries.

11.18 "***Equity Restructuring***" means a nonreciprocal transaction between the Company and its stockholders, such as a stock dividend, stock split, spin-off or recapitalization through a large, nonrecurring cash dividend, that affects the number or kind of Shares (or other Company securities) or the share price of Common Stock (or other Company securities) and causes a change in the per share value of the Common Stock underlying outstanding Awards.

11.19 "***Exchange Act***" means the Securities Exchange Act of 1934, as amended.

11.20 "***Fair Market Value***" means, as of any date, the value of a Share determined as follows: (a) if the Common Stock is listed on any established stock exchange, its Fair Market Value will be the closing sales price for such Common Stock as quoted on such exchange for such date, or if no sale occurred on such date, the last day preceding such date during which a sale occurred, as reported in *The Wall Street Journal* or another source the Administrator deems reliable; (b) if the Common Stock is not traded on a stock exchange but is quoted on a national market or other quotation system, the closing sales price on such date, or if no sales occurred on such date, then on the last date preceding such date during which a sale occurred, as reported in *The Wall Street Journal* or another source the Administrator deems reliable; or (c) without an established market for the Common Stock, the Administrator will determine the Fair Market Value in its discretion.

11.21 "***Good Reason***" means (a) if a Participant is a party to a written employment or consulting agreement with the Company or any of its Subsidiaries or an Award Agreement in which the term "good reason" is defined, "Good Reason" as defined in such agreement, and (b) if no such agreement exists, (i) a change in the Participant's position with the Company (or its Subsidiary employing the Participant) that materially reduces the Participant's authority, duties or responsibilities or the level of management to which he or she reports, (ii) a material diminution in the Participant's level of compensation (including base salary, fringe benefits and target bonuses under any corporate performance-based incentive programs) or (iii) a relocation of the Participant's place of employment by more than 50 miles, provided that such change, reduction or relocation is effected by the Company (or its Subsidiary employing the Participant) without the Participant's consent.

11.22 "***Greater Than 10% Stockholder***" means an individual then owning (within the meaning of Section 424(d) of the Code) more than 10% of the total combined voting power of all classes of stock of the Company, its parent or subsidiary corporation, as defined in Section 424(e) and (f) of the Code, respectively.

11.23 "***Incentive Stock Option***" means an Option intended to qualify as an "incentive stock option" as defined in Section 422 of the Code.

11.24 "***Non-Qualified Stock Option***" means an Option not intended or not qualifying as an Incentive Stock Option.

11.25 "***Option***" means an option to purchase Shares.

11.26 "***Other Stock or Cash Based Awards***" means cash awards, awards of Shares, and other awards valued wholly or partially by referring to, or are otherwise based on, Shares or other property.

11.27 "***Overall Share Limit***" means the sum of (a) Shares; (b) any Shares which are subject to Prior Plan Awards as of the Effective Date which become available for issuance under the Plan pursuant to Article IV (which number added to the Overall Share Limit pursuant to this clause (b) shall not exceed Shares); and (c) an annual increase on the first day of each calendar year beginning January 1, 2020 and ending on and including January 1, 2029, equal to the lesser of (i) 5% of the aggregate number of Shares outstanding on the final day of the immediately preceding calendar year and (ii) such smaller number of Shares as is determined by the Board.

11.28 "***Participant***" means a Service Provider who has been granted an Award.

11.29 "***Performance Criteria***" mean the criteria (and adjustments) that the Administrator may select for an Award to establish performance goals for a performance period, which may include the following: net earnings or losses (either before or after one or more of interest, taxes, depreciation, amortization, and non-cash equity-based compensation expense); gross or net sales or revenue or sales or revenue growth; net income (either before or after taxes) or adjusted net income; profits (including but not limited to gross profits, net profits, profit growth, net operation profit or economic profit), profit return ratios or operating margin; budget or operating earnings (either before or after taxes or before or after allocation of corporate overhead and bonus); cash flow (including operating cash flow and free cash flow or cash flow return on capital); return on assets; return on capital or invested capital; cost of capital; return on stockholders' equity; total stockholder return; return on sales; costs, reductions in costs and cost control measures; expenses; working capital; earnings or loss per share; adjusted earnings or loss per share; price per share or dividends per share (or appreciation in or maintenance of such price or dividends); regulatory achievements or compliance; implementation, completion or attainment of objectives relating to research, development, regulatory, commercial, or strategic milestones or developments; market share; economic value or economic value added models; division, group or corporate financial goals; customer satisfaction/growth; customer service; employee satisfaction; recruitment and maintenance of personnel; human resources management; supervision of litigation and other legal matters; strategic partnerships and transactions; financial ratios (including those measuring liquidity, activity, profitability or leverage); debt levels or reductions; sales-related goals; financing and other capital raising transactions; cash on hand; acquisition activity; investment sourcing activity; and marketing initiatives, any of which may be measured in absolute terms or as compared to any incremental increase or decrease. Such performance goals also may be based solely by reference to the Company's performance or the performance of a Subsidiary, division, business segment or business unit of the Company or a Subsidiary, or based upon performance relative to performance of other companies or upon comparisons of any of the indicators of performance relative to performance of other companies. The Committee may provide for exclusion of the impact of an event or occurrence which the Committee determines should appropriately be excluded, including (a) restructurings, discontinued operations, extraordinary items, and other unusual, infrequently occurring or non-recurring charges or events, (b) asset write-downs, (c) litigation or claim judgments or settlements, (d) acquisitions or divestitures, (e) reorganization or change in the corporate structure or capital structure of the Company, (f) an event either not directly related to the operations of the Company, Subsidiary, division, business segment or business unit or not within the reasonable control of management, (g) foreign exchange gains and losses, (h) a change in the fiscal year of the Company, (i) the refinancing or repurchase of bank loans or debt securities, (j) unbudgeted capital expenditures, (k) the issuance or repurchase of equity securities and other changes in the number of outstanding shares, (l) conversion of some or all of convertible securities to Common Stock, (m) any business interruption event (n) the cumulative effects of tax or accounting changes in accordance with U.S. generally accepted accounting principles, or (o) the effect of changes in other laws or regulatory rules affecting reported results.

11.30 "***Plan***" means this GTx, Inc. 2019 Incentive Award Plan.

11.31 "***Prior Plan***" means the GTx, Inc. 2013 Equity Incentive Plan, as amended to date.

11.32 "***Prior Plan Award***" means an award outstanding under the Prior Plan as of the Plan's effective date under Section 10.3.

11.33 "***Restricted Stock***" means Shares awarded to a Participant under Article VI subject to certain vesting conditions and other restrictions.

11.34 "***Restricted Stock Unit***" means an unfunded, unsecured right to receive, on the applicable settlement date, one Share or an amount in cash or other consideration determined by the Administrator to be of equal value as of such settlement date, subject to certain vesting conditions and other restrictions.

11.35 "***Rule 16b-3***" means Rule 16b-3 promulgated under the Exchange Act.

11.36 "***Section 409A***" means Section 409A of the Code and all regulations, guidance, compliance programs and other interpretative authority thereunder.

11.37 "***Securities Act***" means the Securities Act of 1933, as amended.

11.38 "***Service Provider***" means an Employee, Consultant or Director.

11.39 "***Shares***" means shares of Common Stock.

11.40 "***Stock Appreciation Right***" means a stock appreciation right granted under Article V.

11.41 "***Subsidiary***" means any entity (other than the Company), whether domestic or foreign, in an unbroken chain of entities beginning with the Company if each of the entities other than the last entity in the unbroken chain beneficially owns, at the time of the determination, securities or interests representing at least 50% of the total combined voting power of all classes of securities or interests in one of the other entities in such chain.

11.42 "***Substitute Awards***" shall mean Awards granted or Shares issued by the Company in assumption of, or in substitution or exchange for, awards previously granted, or the right or obligation to make future awards, in each case by a company acquired by the Company or any Subsidiary or with which the Company or any Subsidiary combines.

11.43 "***Termination of Service***" means the date the Participant ceases to be a Service Provider.

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PART II

INFORMATION NOT REQUIRED IN PROXY STATEMENT/PROSPECTUS/INFORMATION STATEMENT

Item 20 – Indemnification and Officers

Subsection (a) of Section 145 of the General Corporation Law of the State of Delaware (the "DGCL") empowers a corporation to indemnify any person who was or is a party or who is threatened to be made a party to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative (other than an action by or in the right of the corporation) by reason of the fact that the person is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise, against expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by the person in connection with such action, suit or proceeding if the person acted in good faith and in a manner the person reasonably believed to be in or not opposed to the best interests of the corporation, and, with respect to any criminal action or proceeding, had no reasonable cause to believe the person's conduct was unlawful.

Subsection (b) of Section 145 empowers a corporation to indemnify any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action or suit by or in the right of the corporation to procure a judgment in its favor by reason of the fact that the person acted in any of the capacities set forth above, against expenses (including attorneys' fees) actually and reasonably incurred by the person in connection with the defense or settlement of such action or suit if the person acted in good faith and in a manner the person reasonably believed to be in or not opposed to the best interests of the corporation, except that no indemnification shall be made in respect of any claim, issue or matter as to which such person shall have been adjudged to be liable to the corporation unless and only to the extent that the Court of Chancery or the court in which such action or suit was brought shall determine upon application that, despite the adjudication of liability but in view of all the circumstances of the case, such person is fairly and reasonably entitled to indemnity for such expenses which the Court of Chancery or such other court shall deem proper.

Section 145 further provides that to the extent a director or officer of a corporation has been successful on the merits or otherwise in the defense of any action, suit or proceeding referred to in subsections (a) and (b) of Section 145, or in defense of any claim, issue or matter therein, such person shall be indemnified against expenses (including attorneys' fees) actually and reasonably incurred by such person in connection therewith; that indemnification provided for by Section 145 shall not be deemed exclusive of any other rights to which the indemnified party may be entitled; and the indemnification provided for by Section 145 shall, unless otherwise provided when authorized or ratified, continue as to a person who has ceased to be a director, officer, employee or agent and shall inure to the benefit of such person's heirs, executors and administrators. Section 145 also empowers the corporation to purchase and maintain insurance on behalf of any person who is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise against any liability asserted against such person and incurred by such person in any such capacity, or arising out of his status as such, whether or not the corporation would have the power to indemnify such person against such liabilities under Section 145.

Section 102(b)(7) of the DGCL provides that a corporation's certificate of incorporation may contain a provision eliminating or limiting the personal liability of a director to the corporation or its stockholders for monetary damages for breach of fiduciary duty as a director, provided that such provision shall not eliminate or limit the liability of a director (i) for any breach of the director's duty of loyalty to the corporation or its stockholders, (ii) for acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law, (iii) under Section 174 of the DGCL or (iv) for any transaction from which the director derived an improper personal benefit.

GTx's restated certificate of incorporation provides that to the fullest extent permitted by the DGCL, a director of GTx shall not be personally liable to GTx or its stockholders for monetary damages for breach of fiduciary duty as a director. GTx's amended and restated bylaws provide that to the fullest extent permitted by applicable law as it presently exists or may hereafter be amended, any person who was or is made or is threatened to be made a party or is otherwise involved in any action, suit or proceeding, whether civil, criminal administrative or investigative, by reason of the fact that the person is or was a director, officer, employee or agent of the corporation, is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation or of a partnership, joint venture, trust, or other enterprise, against all expense, liability and loss actually and reasonably incurred or suffered by such person in connection with such action, suit or proceeding.

GTx entered into indemnification agreements with its directors and executive officers, in addition to the indemnification provided for in its restated certificate of incorporation and amended and restated bylaws, and intends to enter into indemnification agreements with any new directors and executive officers in the future.

GTx has purchased and intends to maintain insurance on behalf of any person who is or was a director or officer of GTx against any loss arising from any claim asserted against him or her and incurred by him or her in any such capacity, subject to certain inclusions.

Pursuant to the terms of the Merger Agreement, from the Effective Time through the sixth anniversary of the date on which the Effective Time occurs, GTx must indemnify and hold harmless each person who is now, or has been at any time prior to the date thereof, or who becomes prior to the Effective Time, a director or officer of GTx or Oncternal, respectively, against all claims, losses, liabilities, damages, judgments, fines and reasonable fees, costs and expenses, including attorney's fees and disbursements, incurred in connection with any claim, action, suit, proceeding or investigation, whether civil or criminal, administrative or investigative, arising out of or pertaining to the fact that the director or officer is or was a director or officer of GTx or of Oncternal, whether asserted or claimed prior to, at or after the Effective time, in each case, to the fullest extent permitted under the DGCL. Each such person will also be entitled to advancement of expenses incurred in the defense of any such claim, action, suit, proceeding or investigation, provided that such person provides an undertaking required by the DGCL, to repay such advances if it is ultimately determined that such person is not entitled to indemnification. From and after the Effective Time, GTx must maintain directors' and officers' liability insurance policies, with an effective date as of the closing date of the merger, on commercially available terms and conditions and with coverage limits customary for U.S. public companies similarly situated to GTx. In addition, GTx shall purchase, prior to the Effective Time, a six-year prepaid "tail policy" for the non-cancellable extension of the directors' and officers' liability coverage of GTx's existing directors' and officers' insurance policies for a claims reporting or discovery period of at least six years from and after the Effective time with respect to any claim related to any period of time at or prior to the Effective Time.

Further, pursuant to the terms of the Merger Agreement, the provisions of the restated certificate of incorporation and amended and restated bylaws of GTx with respect to indemnification, advancement of expenses and exculpation of present and former directors and officers of GTx shall not be amended, modified or repealed for a period of six years from the Effective Time in a manner that would adversely affect the rights thereunder of individuals who, at or prior to the Effective Time, were officers or directors of GTx.

Item 21 – Exhibits

(a) Exhibit Index

A list of exhibits filed with this registration statement on Form S-4 is set forth on the Exhibit Index and is incorporated herein by reference.

(b) Financial Statements

The financial statements filed with this registration statement on Form S-4 are set forth on the Financial Statement Index and are incorporated herein by reference.

Item 22 – Undertakings

(a) The undersigned registrant hereby undertakes as follows:

(1) To deliver or cause to be delivered with the prospectus, to each person to whom the prospectus is sent or given, the latest annual report to security holders that is incorporated by reference in the prospectus and furnished pursuant to and meeting the requirements of Rule 14a-3 or Rule 14c-3 under the Securities Exchange Act of 1934; and, where interim financial information required to be presented by Article 3 of Regulation S-X are not set forth in the prospectus, to deliver, or cause to be delivered to each person to whom the prospectus is sent or given, the latest quarterly report that is specifically incorporated by reference in the prospectus to provide such interim financial information.

(2) That prior to any public reoffering of the securities registered hereunder through use of a proxy statement/prospectus/information statement which is a part of this registration statement, by any person or party who is deemed to be an underwriter within the meaning of Rule 145(c), the issuer undertakes that such reoffering proxy statement/prospectus/information statement will contain the information called for by the applicable registration form with respect to reofferings by persons who may be deemed underwriters, in addition to the information called for by the other items of the applicable form.

(3) That every proxy statement/prospectus/information statement (i) that is filed pursuant to paragraph (a)(1) immediately preceding, or (ii) that purports to meet the requirements of Section 10(a)(3) of the Securities Act and is used in connection with an offering of securities subject to Rule 415, will be filed as a part of an amendment to the registration statement and will not be used until such amendment is effective, and that, for purposes of determining any liability under the Securities Act, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

(b) The undersigned registrant hereby undertakes to respond to requests for information that is incorporated by reference into the prospectus pursuant to Items 4, 10(b), 11, or 13 of this Form, within one business day of receipt of such request, and to send the incorporated documents by first class mail or other equally prompt means. This includes information contained in documents filed subsequent to the effective date of the registration statement through the date of responding to the request.

(c) The undersigned registrant hereby undertakes to supply by means of a post-effective amendment all information concerning a transaction, and the company being acquired involved therein, that was not the subject of and included in the registration statement when it became effective.

(d) Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers and controlling persons of the registrant pursuant to the foregoing provisions, or otherwise, the registrant has been advised that in the opinion of the SEC such indemnification is against public policy as expressed in the Securities Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer or controlling person of the registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Securities Act and will be governed by the final adjudication of such issue.

INDEX TO EXHIBITS

Exhibit Number	Description of Exhibit	Incorporated by Reference				Filed Herewith
		Form	File Number	Date of Filing	Exhibit Number	
2.1	Asset Purchase Agreement dated as of September 28, 2012 between the Registrant and Strakan International S.à r.l.	8-K	000-50549	October 3, 2012	2.1	
2.2*	Agreement and Plan of Merger and Reorganization, dated March 6, 2019, by and among the Registrant, Oncternal Therapeutics, Inc. and Grizzly Merger Sub, Inc.	8-K	000-50549	March 7, 2019	2.1	
2.3*	Form of CVR Agreement by and between the Registrant, Marc S. Hanover, as the Holders' Representative, and Computershare Investor Services, as Rights Agent	8-K	000-50549	March 7, 2109	2.2	
2.4	Form of GTx Voting Agreement, dated March 6, 2019, by and between Oncternal Therapeutics, Inc., the Registrant and each of the parties named in each agreement therein	8-K	000-50549	March 7, 2019	2.3	
2.5	Form of Oncternal Voting Agreement, dated March 6, 2019, by and between the Registrant, Oncternal Therapeutics, Inc. and each of the parties named in each agreement therein	8-K	000-50549	March 7, 2019	2.4	
2.6	Form of Lock-Up Agreement, dated March 6, 2019, by each of the parties named in each agreement therein	8-K	000-50549	March 7, 2019	2.5	
3.1	Restated Certificate of Incorporation of GTx, Inc.	S-3	333-127175	August 4, 2005	4.1	
3.2	Certificate of Amendment of Restated Certificate of Incorporation of GTx, Inc.	8-K	000-50549	May 6, 2011	3.2	
3.3	Certificate of Amendment of Restated Certificate of Incorporation of GTx, Inc.	8-K	000-50549	May 9, 2014	3.3	
3.4	Certificate of Amendment of Restated Certificate of Incorporation of GTx, Inc.	10-Q	000-50549	May 11, 2015	3.4	

Exhibit Number	Description of Exhibit	Incorporated by Reference				Filed Herewith
		Form	File Number	Date of Filing	Exhibit Number	
3.5	Certificate of Amendment of Restated Certificate of Incorporation of GTx, Inc.	8-K	000-50549	December 5, 2016	3.1	
3.6	Amended and Restated Bylaws of GTx, Inc.	8-K	000-50549	March 7, 2019	3.1	
4.1	Reference is made to Exhibits 3.1, 3.2, 3.3 , 3.4, 3.5 and 3.6					
4.2	Specimen of Common Stock Certificate	S-1	333-109700	December 22, 2003	4.2	
4.3	Amended and Restated Registration Rights Agreement between Registrant and J. R. Hyde, III dated August 7, 2003	S-1	333-109700	October 15, 2003	4.4	
4.4	Consent, Waiver and Amendment among Registrant, J. R. Hyde, III and Pittco Associates, L.P. dated December 3, 2007	S-3	333-148321	December 26, 2007	4.6	
4.5	Waiver and Amendment Agreement among Registrant, J.R. Hyde, III and Pittco Associates, L.P. dated March 6, 2014	10-K	000-50549	March 12, 2014	4.5	
4.6	Amended and Restated Registration Rights Agreement among Registrant, J.R. Hyde, III and The Pyramid Peak Foundation, dated August 4, 2014	10-Q	000-50549	August 5, 2014	4.6	
4.7	Consent, Waiver and Amendment Agreement between Registrant and J.R. Hyde, III and Pittco Associates, L.P., dated August 4, 2014	10-Q	000-50549	August 5, 2014	4.8	
4.8	Form of Common Stock Warrant, issued by Registrant pursuant to the Purchase Agreement, dated November 9, 2014, between Registrant and the purchasers identified in Exhibit A therein	10-K	000-50549	March 16, 2015	4.9	
4.9	Form of Warrant Amendment Agreement entered into effective as of March 25, 2016 between Registrant and each holder of a Common Stock Warrant originally issued on November 14, 2014	10-Q	000-50549	May 10, 2016	4.9	

Exhibit Number	Description of Exhibit	Incorporated by Reference				Filed Herewith
		Form	File Number	Date of Filing	Exhibit Number	
4.10	Form of Common Stock Warrant, issued by Registrant pursuant to the Purchase Agreement, dated September 25, 2017, between Registrant and the purchasers identified in Exhibit A therein	S-3	333-221040	October 20, 2017	4.9	
4.11	Form of Warrant to purchase shares Series B-2 Preferred Stock of Oncternal Therapeutics, Inc.					X
5.1^	Opinion of Cooley LLP regarding the validity of the securities					
8.1^	Legal Opinion of Cooley LLP regarding tax matters					
8.2^	Legal Opinion of Latham & Watkins LLP regarding tax matters					
10.1†	Consolidated, Amended, and Restated License Agreement dated July 24, 2007, between Registrant and University of Tennessee Research Foundation	10-Q	000-50549	November 9, 2007	10.40	
10.2	First Amendment, dated December 29, 2008, to the Consolidated, Amended and Restated License Agreement dated July 24, 2007 between the Registrant and University of Tennessee Research Foundation	10-K	000-50549	March 3, 2009	10.47	
10.3#	Form of Indemnification Agreement	S-1	333-109700	December 22, 2003	10.12	
10.4#	Genotherapeutics, Inc. 1999 Stock Option Plan, as amended through December 10, 2009 (refiled to reflect reverse stock split effected on December 5, 2016), and Form of Stock Option Agreement	10-K	000-50549	March 24, 2017	10.4	
10.5#	GTx, Inc. 2000 Stock Option Plan, as amended through December 10, 2009 (refiled to reflect reverse stock split effected on December 5, 2016), and Form of Stock Option Agreement	10-K	000-50549	March 24, 2017	10.5	
10.6#	GTx, Inc. 2001 Stock Option Plan, as amended through November 3, 2009 (refiled to reflect reverse stock split effected on December 5, 2016), and Form of Stock Option Agreement	10-K	000-50549	March 24, 2017	10.6	

Exhibit Number	Description of Exhibit	Incorporated by Reference				Filed Herewith
		Form	File Number	Date of Filing	Exhibit Number	
10.7#	GTx, Inc. 2002 Stock Option Plan, as amended through November 3, 2009 (refiled to reflect reverse stock split effected on December 5, 2016), and Form of Stock Option Agreement	10-K	000-50549	March 24, 2017	10.7	
10.8#	GTx, Inc. 2004 Equity Incentive Plan, as originally adopted, and Form of Stock Option Agreement	S-1	333-109700	January 15, 2004	10.5	
10.9#	GTx, Inc. 2004 Equity Incentive Plan, as amended effective April 30, 2008	8-K	000-50549	May 6, 2008	10.6	
10.10#	GTx, Inc. 2004 Equity Incentive Plan, as amended effective November 4, 2008 (refiled to reflect reverse stock split effected on December 5, 2016) and Form of Stock Option Agreement	10-K	000-50549	March 24, 2017	10.10	
10.11#	GTx, Inc. 2004 Non-Employee Directors' Stock Option Plan and Form of Stock Option Agreement, as originally adopted	S-1	333-109700	January 15, 2004	10.6	
10.12#	Amended and Restated GTx, Inc. 2004 Non-Employee Directors' Stock Option Plan, effective April 26, 2006	8-K	000-50549	April 27, 2006	10.1	
10.13#	Form of Stock Option Agreement under the Amended and Restated GTx, Inc. 2004 Non-Employee Directors' Stock Option Plan	10-Q	000-50549	August 9, 2006	10.35	
10.14#	Amended and Restated GTx, Inc. 2004 Non-Employee Directors' Stock Option Plan, as amended effective November 4, 2008 (refiled to reflect reverse stock split effected on December 5, 2016)	10-K	000-50549	March 24, 2017	10.14	
10.15#	GTx, Inc. 2013 Equity Incentive Plan, as originally adopted	S-8	333-188377	May 6, 2013	99.1	
10.16#	GTx, Inc. 2013 Equity Incentive Plan, as amended effective May 6, 2015 (refiled to reflect reverse stock split effected on December 5, 2016)	10-K	000-50549	March 24, 2017	10.16	
10.17#	Form of Stock Option Grant Notice and Option Agreement under the GTx, Inc. 2013 Equity Incentive Plan (Standard Form)	10-Q	000-50549	July 22, 2013	10.2	

Exhibit Number	Description of Exhibit	Incorporated by Reference				Filed Herewith
		Form	File Number	Date of Filing	Exhibit Number	
10.18#	Form of Retention Stock Option Grant Notice and Option Agreement under the GTx, Inc. 2013 Equity Incentive Plan	10-Q	000-50549	November 12, 2013	10.3	
10.19#	Form of Retention Restricted Stock Unit Grant Notice and Restricted Stock Unit Award Agreement under the GTx, Inc. 2013 Equity Incentive Plan	10-Q	000-50549	November 12, 2013	10.4	
10.20#	Form of Restricted Stock Unit Grant Notice and Restricted Stock Unit Award Agreement under the GTx, Inc. 2013 Equity Incentive Plan	10-Q	000-50549	May 11, 2015	10.5	
10.21#	GTx, Inc. 2013 Non-Employee Director Equity Incentive Plan, as originally adopted (refiled to reflect reverse stock split effected on December 5, 2016)	10-K	000-50549	March 24, 2017	10.21	
10.22#	Form of Stock Option Grant Notice and Option Agreement under the GTx, Inc. 2013 Non-Employee Director Equity Incentive Plan	10-Q	000-50549	July 22, 2013	10.4	
10.23#	Employment Agreement dated February 12, 2015, between Registrant and Robert J. Wills	10-Q	000-50549	May 11, 2015	10.4	
10.24#	Employment Agreement dated July 13, 2015, between Registrant and Diane C. Young	10-Q	000-50549	November 9, 2015	10.1	
10.25#	Amended and Restated Employment Agreement dated February 12, 2015, between Registrant and Marc S. Hanover	10-K	000-50549	March 16, 2015	10.25	
10.26#	Amended and Restated Employment Agreement dated February 14, 2013, between Registrant and Henry P. Doggrell	10-K	000-50549	March 5, 2013	10.22	
10.27#	Employment Agreement dated January 6, 2017 between Registrant and Jason T. Shackelford	10-K	000-50549	March 24, 2017	10.28	
10.28#	Form of Retention Benefits Letter Agreement for Mitchell S. Steiner and Marc S. Hanover	10-Q	000-50549	November 12, 2013	10.1	

Exhibit Number	Description of Exhibit	Incorporated by Reference				Filed Herewith
		Form	File Number	Date of Filing	Exhibit Number	
10.29#	Form of Retention Benefits Letter Agreement for Jason T. Shackelford and Henry P. Doggrell	10-Q	000-50549	November 12, 2013	10.2	
10.30#	Amended and Restated GTx, Inc. Executive Bonus Compensation Plan, effective November 4, 2008	10-K	000-50549	March 3, 2009	10.53	
10.31#	2017 Compensation Information for Registrant's Executive Officers	10-Q	000-50549	May 15, 2017	10.2	
10.32#	Directors' Deferred Compensation Plan, as amended and restated effective February 14, 2013	10-K	000-50549	March 5, 2013	10.28	
10.33#	Directors' Deferred Compensation Plan, as amended and restated effective February 18, 2016 (refiled to reflect reverse stock split effected on December 5, 2016)	10-K	000-50549	March 24, 2017	10.34	
10.34#	Non-Employee Director Compensation Policy of GTx, Inc., effective January 1, 2016	10-K	000-50549	March 15, 2016	10.39	
10.35	Lease agreement, dated April 13, 2015, between Registrant and Hertz Memphis Three LLC	10-Q	000-50549	August 10, 2015	10.1	
10.36	Purchase Agreement, dated November 9, 2014, between Registrant and the purchasers identified in Exhibit A therein	8-K	000-50549	November 10, 2014	10.1	
10.37	Form of Subscription Agreement for October 2016 registered direct offering	8-K	000-50549	October 12, 2016	10.1	
10.38	Loan Agreement, dated as of August 10, 2017, by and among Registrant, J.R. Hyde, III and The Pyramid Peak Foundation and form of Promissory Note	10-Q	000-50549	August 14, 2017	10.1	
10.39	Securities Purchase Agreement, dated as of September 25, 2017, between Registrant and the purchasers identified on Exhibit A	8-K	000-50549	September 29, 2017	10.1	
10.40	At-the-Market Equity Offering Sales Agreement, dated February 9, 2018, by and between Registrant and Stifel, Nicolaus & Company, Incorporated	8-K	000-50549	February 9, 2018	10.1	

Exhibit Number	Description of Exhibit	Incorporated by Reference				Filed Herewith
		Form	File Number	Date of Filing	Exhibit Number	
10.41††	License Agreement, effective March 1, 2015, between the Registrant and University of Tennessee Research Foundation	10-K	000-50549	March 19, 2019	10.41	
10.42††	Amendment #1 to the License Agreement, dated November 12, 2015, between the Registrant and University of Tennessee Research Foundation	10-K	000-50549	March 19, 2019	10.42	
10.43††	Amendment #2 to the License Agreement, as amended, dated August 12, 2016, between the Registrant and University of Tennessee Research Foundation	10-K	000-50549	March 19, 2019	10.43	
10.44††	Amendment #3 to the License Agreement, as amended, dated April 6, 2017, between the Registrant and University of Tennessee Research Foundation	10-K	000-50549	March 19, 2019	10.44	
10.45††	Amendment #4 to the License Agreement, as amended, dated October 23, 2018, between the Registrant and University of Tennessee Research Foundation	10-K	000-50549	March 19, 2019	10.45	
10.46†	Commercial License Agreement between Selexis SA (predecessor to Oncternal Therapeutics, Inc.) and ROAR Therapeutics, LLC, dated May 19, 2014					X
10.47†	Exclusive License Agreement between Georgetown University and Oncternal Therapeutics, Inc., dated March 26, 2014					X
10.48	Amendment to Exclusive License Agreement between Georgetown University and Oncternal Therapeutics, Inc., dated March 17, 2016					X
10.49†	Collaboration Agreement between Oncternal Therapeutics, Inc. and The University of Texas M.D. Anderson Cancer Center, dated December 15, 2014					X

Exhibit Number	Description of Exhibit	Incorporated by Reference				Filed Herewith
		Form	File Number	Date of Filing	Exhibit Number	
10.50†	Amendment #1 to Collaboration Agreement between Oncternal Therapeutics, Inc. and The University of Texas M.D. Anderson Cancer Center, dated January 24, 2016					X
10.51†	Amendment #2 to Collaboration Agreement between Oncternal Therapeutics, Inc. and The University of Texas M.D. Anderson Cancer Center, dated May 1, 2016					X
10.52†	Amendment #3 to Collaboration Agreement between Oncternal Therapeutics, Inc. and The University of Texas M.D. Anderson Cancer Center, dated September 17, 2018					X
10.53†	Research agreement between Oncternal Therapeutics, Inc. and the Regents of the University of California, on behalf of its San Diego Campus, dated November 3, 2016					X
10.54†	License Agreement between Oncternal Therapeutics, Inc. and Velos Biopharma Holdings, LLC, dated February 6, 2018					X
10.55†	Amended and Restated License Agreement between Oncternal Therapeutics, Inc. and The Regents of the University of California, dated August 31, 2018					X
10.56†	Amendment #1 to Amended and Restated License Agreement between Oncternal Therapeutics, Inc. and the Regents of the University of California, dated March 25, 2019					X
10.57#	Oncternal Therapeutics, Inc. 2015 Equity Incentive Plan, as amended					X
10.58#	Form of Stock Option Agreement under the Oncternal Therapeutics, Inc. 2015 Equity Incentive Plan, as amended					X

Exhibit Number	Description of Exhibit	Incorporated by Reference				Filed Herewith
		Form	File Number	Date of Filing	Exhibit Number	
10.59#	Form of Early Exercise Stock Option Agreement under the Oncternal Therapeutics, Inc. 2015 Equity Incentive Plan, as amended					X
10.60#	Restricted Stock Purchase Agreement dated May 22, 2017, between Oncternal Therapeutics, Inc. and Richard G. Vincent					X
10.61#	Restricted Stock Purchase Agreement dated December 14, 2017, between Oncternal Therapeutics, Inc. and Richard G. Vincent					X
10.62#	Restricted Stock Purchase Agreement dated December 14, 2017, between Oncternal Therapeutics, Inc. and William R. LaRue					X
10.63#	Restricted Stock Purchase Agreement dated May 9, 2018, between Oncternal Therapeutics, Inc. and Charles Theuer, M.D., Ph.D.					X
10.64#	Employment Letter dated May 31, 2017, between Oncternal Therapeutics, Inc. and James B. Breitmeyer, M.D., Ph.D.					X
10.65#	Employment Letter dated January 1, 2019, between Oncternal Therapeutics, Inc. and Richard G. Vincent					X
10.66#	Consulting Agreement dated April 3, 2017, between Oncternal Therapeutics, Inc. and Richard G. Vincent					X
23.1	Consent of Ernst & Young LLP, Independent Registered public Accounting Firm to GTx Inc.					X
23.2	Consent of BDO USA, LLP, Independent Registered public Accounting Firm to Oncternal Therapeutics, Inc., Inc.					X
24.1	Power of Attorney (included on signature page)					X

Exhibit Number	Description of Exhibit	Incorporated by Reference				Filed Herewith
		Form	File Number	Date of Filing	Exhibit Number	
99.1#	GTx, Inc. 2019 Incentive Award Plan (included as *Annex F* to the proxy statement/prospectus/information statement forming a part of this Registration Statement)					X
99.2	Opinion of Aquilo Partners, L.P., financial advisor to GTx, Inc. (included as *Annex B* to the proxy statement/prospectus/information statement forming part of this Registration Statement)					X
99.3	Consent of Aquilo Partners, L.P., financial advisor to GTx, Inc.					X
99.4(a)	Proposed Restated Certificate of Incorporation of GTx, Inc. (included as *Annex D* to the proxy statement/prospectus/information statement forming a part of this Registration Statement)					X
99.4(b)	Proposed Restated Certificate of Incorporation of GTx, Inc. (included as *Annex E* to the proxy statement/prospectus/information statement forming a part of this Registration Statement)					X
99.5	Consent of Charles Theurer to be named as a Director					X
99.6	Consent of David Hale to be named as a Director					X
99.7	Consent of James Breitmeyer to be named as a Director					X
99.8	Consent of William LaRue to be named as a Director					X
99.9	Consent of Xin Nakahashi to be named as a Director					X
99.10	Consent of Yanjun Liu to be named as a Director					X
99.11	Consent of Daniel Kisner to be named as a Director					X
101.INS	XBRL Instance Document					X
101.SCH	XBRL Taxonomy Extension Schema Document					X
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document					X

Exhibit Number	Description of Exhibit	Incorporated by Reference				Filed Herewith
		Form	File Number	Date of Filing	Exhibit Number	
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document					X
101.LAB	XBRL Taxonomy Extension Labels Linkbase Document					X
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document					X

* All schedules and exhibits to the agreement have been omitted pursuant to Item 601(b)(2) of Regulation S-K. A copy of any omitted schedule and/or exhibit will be furnished to the Securities Exchange Commission upon request.

Management compensatory plan or arrangement

^ To be filed by amendment.

† Portions of this exhibit have been omitted.

†† Confidential treatment has been requested for portions of this exhibit. Those portions have been omitted and filed separately with the Securities Exchange Commission.

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SIGNATURES

Pursuant to the requirements of the Securities Act, the registrant has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized in the city of Memphis, State of Tennessee, on the 5th day of April, 2019.

GTx, Inc.

By: /s/ Marc S. Hanover
Marc S. Hanover
Chief Executive Officer

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Marc S. Hanover, Henry P. Doggrell and Jason T. Shackelford as his true and lawful attorneys-in-fact and agents, with full power of substitution, for him and in his name, place and stead, in any and all capacities, to sign any and all amendments (including post-effective amendments) to this registration statement, and all post-effective amendments thereto, and to file the same, with all exhibits thereto and all documents in connection therewith, with the SEC, granting unto said attorneys-in-fact and agents, and full power and authority to do and perform each and every act and thing requisite and necessary to be done in and about the premises, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming that said attorneys-in-fact and agents, or his substitute, may lawfully do or cause to be done by virtue hereof.

IN WITNESS WHEREOF, each of the undersigned has executed this Power of Attorney as of the date indicated opposite his/her name.

Pursuant to the requirements of the Securities Act, this report has been signed by the following persons on behalf of the Registrant and in the capacities and on the dates indicated.

Signature	Title	Date
/s/ Marc S. Hanover Marc S. Hanover	Chief Executive Officer and Director (*Principal Executive Officer*)	April 5, 2019
/s/ Jason T. Shackelford Jason T. Shackelford	Vice President, Finance and Accounting, and Principal Financial and Accounting Officer (*Principal Financial and Accounting Officer*)	April 5, 2019
/s/ Robert J. Wills Robert J. Wills, Ph.D.	Executive Chairman of the Board of Directors	April 5, 2019
/s/ Michael G. Carter Michael G. Carter, M.D.	Director	April 5, 2019
/s/ J.R. Hyde, III J.R. Hyde, III	Director	April 5, 2019
/s/ J. Kenneth Glass J. Kenneth Glass	Director	April 5, 2019

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Signature	Title	Date
/s/ Garry A. Neil, M.D. Garry A. Neil, M.D.	Director	April 5, 2019
/s/ Kenneth S. Robinson, M.D., M. Div. Kenneth S. Robinson, M.D., M.Div.	Director	April 5, 2019

Exhibit 4.11

THIS WARRANT AND THE SECURITIES ISSUABLE UPON EXERCISE OF THIS WARRANT HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "ACT"). THESE SECURITIES MAY NOT BE SOLD OR TRANSFERRED IN THE ABSENCE OF SUCH REGISTRATION OR AN EXEMPTION THEREFROM UNDER SAID ACT.

THE SALE OF THE SECURITIES WHICH ARE THE SUBJECT OF THIS WARRANT HAS NOT BEEN QUALIFIED WITH THE COMMISSIONER OF CORPORATIONS OF THE STATE OF CALIFORNIA OR ANY OTHER STATE AND THE ISSUANCE OF SUCH SECURITIES OR THE PAYMENT OR RECEIPT OF ANY PART OF THE CONSIDERATION FOR SUCH SECURITIES PRIOR TO SUCH QUALIFICATION IS UNLAWFUL, UNLESS THE SALE OF SUCH SECURITIES IS EXEMPT FROM QUALIFICATION BY SECTION 2511, 25102 OR 25105 OF THE CALIFORNIA CORPORATIONS CODE OR SUCH PROVISIONS OF THE CORPORATIONS CODE OF ANY SUCH OTHER STATE. THE RIGHTS OF THE HOLDER OF THIS WARRANT ARE EXPRESSLY CONDITIONED UPON SUCH QUALIFICATION BEING OBTAINED, UNLESS THE SALE IS SO EXEMPT.

Void after
, 2022

WARRANT TO PURCHASE SHARES
OF SERIES B-2 PREFERRED STOCK

of

ONCTERNAL THERAPEUTICS, INC.

INCORPORATED UNDER THE LAWS OF THE STATE OF DELAWARE

THIS CERTIFIES THAT, for value received, _____, together with its permitted successors and assigns ("***Holder***") is entitled, subject to the terms set forth below, to subscribe for and purchase shares of Series B-2 Preferred Stock, par value $0.0001 per share (the "***Series B-2 Preferred Stock***") of **ONCTERNAL THERAPEUTICS, INC.**, a Delaware corporation (the "***Company***"), subject to adjustment as provided herein. This warrant and any warrant subsequently issued upon exchange or transfer hereof are hereinafter referred to collectively as the "***Warrant***."

This Warrant is subject to the following terms and conditions:

1. Purchase Agreement. This Warrant is issued in connection with that certain Series B-2 Preferred Stock and Warrant Purchase Agreement dated September 12, 2017 by and among the Company and the entities and persons listed on the Schedule of Investors thereto (as amended, the "***Agreement***"), and the Holder and the Company shall be bound by all the terms, conditions and provisions of the Agreement. All capitalized terms used but not defined in this Warrant shall have the meanings ascribed thereto in the Agreement.

2. Exercise of Warrant. The terms and conditions upon which this Warrant may be exercised, and the shares covered hereby may be purchased, are as follows:

2.1 Term. Subject to the terms hereof and unless sooner terminated as provided below in Section 6.2, this Warrant may be exercised at any time after the date hereof, or from time to time, in whole or in part; provided, however, that in no event may this Warrant be exercised later than 5:00 p.m. (Pacific Time) on the close of business on , 2022 (the "***Exercise Period***").

2.2 Number of Series B-2 Preferred Stock Shares. This Warrant may be exercised for _____ (_____) shares of Series B-2 Preferred Stock, subject to adjustment as provided herein.

2.3 Exercise Price. The "***Exercise Price***" shall be $0.45 per share, subject to adjustment as provided herein.

2.4 Method of Exercise. Subject to the terms and conditions contained herein and while this Warrant remains outstanding and exercisable, this Warrant is exercisable with respect to any or all of the shares of Series B-2 Preferred Stock, at the option of Holder, upon surrender of this Warrant to the Company together with (a) a duly completed (i) Notice of Exercise, in the form attached hereto as Exhibit A, or (ii) a Net Issue Election Notice, in the form attached hereto as Exhibit B, solely in connection with a consolidation or merger of the Company with or into another corporation (other than a merger solely to effect a reincorporation of the Company into another state), or the sale or other disposition of all or substantially all the properties and assets of the Company in its entirety to any other person (collectively, a "***Change of Control***"), or after the Company completes an initial public offering of shares of its Common Stock (an "***IPO***"), and (b) payment of an amount equal to the Exercise Price multiplied by the number of shares of Series B-2 Preferred Stock with respect to which this Warrant is being exercised as provided in Section 2.5 below. If Holder exercises this Warrant with respect to less than all of the shares of Series B-2 Preferred Stock represented by this Warrant, the Company shall cancel this Warrant upon the surrender thereof and shall execute and deliver to Holder a new Warrant for the balance of such shares of Series B-2 Preferred Stock.

2.5 Payment. Payment of the Exercise Price for the shares of Series B-2 Preferred Stock with respect to which this Warrant is being exercised by Holder shall be made, at the option of Holder, (a) by delivery of cash payable by wire transfer of immediately available funds, (b) by the delivery of a cashier's check or certified check, (c) by net issue election as set forth in Section 2.6 below, or (d) by any combination of (a) – (c).

2.6 Net Issue Election Solely in connection with a Change of Control or after an IPO, Holder may elect to receive, without payment by Holder of any additional consideration, shares of Series B-2 Preferred Stock equal to the value of the "spread" on the shares of Series B-2 Preferred Stock or any portion thereof by the surrender of the Warrant to the Company, together with a duly completed Net Issue Election Notice, in the form attached hereto as Exhibit B, at the principal office of the Company, in which event the Company shall issue to Holder such number of shares of Series B-2 Preferred Stock as is computed using the following formula, rounded down to the nearest whole share:

$$X = \frac{Y\,(A - B)}{A}$$

Where: X = The number of shares of Series B-2 Preferred Stock to be issued to Holder pursuant to the net issue election;

Y = The number of shares of Series B-2 Preferred Stock in respect of which the net issue election is made;

A = The fair market value (as determined below) of one share of Series B-2 Preferred Stock at the time the net issue election is made; and

B = The Exercise Price in effect under this Warrant as of the date of the net issue election.

For purposes of this Section 2.6, the fair market value of one share of Series B-2 Preferred Stock as of a particular date shall be as determined in good faith by the Board of Directors of the Company.

3. Adjustment of Exercise Price and Number of Shares. The Exercise Price and the number of shares of Series B-2 Preferred Stock purchasable upon the exercise of this Warrant shall be subject to adjustment from time to time upon the happening of certain events as follows:

3.1 Conversion of Series B-2 Preferred Stock into Common Stock. Upon conversion of all of the issued and outstanding shares of the Company's Series B-2 Preferred Stock into shares of the Company's Common Stock ("***Common Stock***"), this Warrant shall be automatically exercisable only for such number of shares of Common Stock as Holder would have received had this Warrant been exercised in full for the shares of Series B-2 Preferred Stock and then converted into Common Stock on the date all issued and outstanding shares of the Company's Preferred Stock converted into Common Stock. The Exercise Price in effect immediately prior to such conversion shall, concurrently with the effectiveness of such conversion, be proportionally adjusted. Upon such conversion of the Series B-2 Preferred Stock into Common Stock, all references under this Warrant to shares of Series B-2 Preferred Stock shall be deemed references to Common Stock.

3.2 Split, Subdivision or Combination. If the Company should at any time or from time to time fix a record date for (a) the effectuation of a split or subdivision of the outstanding shares of Series B-2 Preferred Stock or (b) the determination of Holders of Series B-2 Preferred Stock entitled to receive a dividend or other distribution payable in additional shares of Series B-2 Preferred Stock or other securities or rights convertible into, or entitling Holder thereof to receive directly or indirectly, additional shares of Series B-2 Preferred Stock (hereinafter referred to as the "***Series B-2 Equivalents***"), without payment of any consideration by such holder for the additional shares of Series B-2 Preferred Stock or Series B-2 Equivalents, then, as of such record date (or the date of such distribution, split or subdivision if no record date is fixed), the Exercise Price shall be appropriately decreased and the number of shares of Series B-2 Preferred Stock which this Warrant is exercisable for, if any, shall be appropriately increased in proportion to such increase of outstanding shares. Notwithstanding the foregoing, in any such case, the aggregate purchase price payable by Holder for the total number of shares of Series B-2 Preferred Stock (as adjusted) shall remain the same.

3.3 Combination of Shares. If the number of shares of Series B-2 Preferred Stock outstanding at any time after the date hereof is decreased by a combination of the outstanding shares Series B-2 Preferred Stock, the Exercise Price shall be appropriately increased and the number of shares of Series B-2 Preferred Stock for which this Warrant is exercisable, if any, shall be appropriately decreased in proportion to such decrease in outstanding shares. Notwithstanding the foregoing, in any such case, the aggregate purchase price payable by Holder for the total number of shares of Series B-2 Preferred Stock (as adjusted) shall remain the same.

3.4 Reclassification or Reorganization. If the shares of Series B-2 Preferred Stock shall be changed into the same or different number of shares of any class or classes of stock, whether by capital reorganization, reclassification or otherwise (other than a subdivision, conversion or combination of shares or stock dividend provided for in Sections 3.1, 3.2 and 3.3 above), then and in each such event Holder shall be entitled to receive upon the exercise of this Warrant the kind and amount of shares of stock and other securities and property receivable upon such reorganization, reclassification or other change, to which a holder of the number of shares of Series B-2 Preferred Stock (or any shares of stock or other securities which may be) issuable upon the exercise of this Warrant would have received if this Warrant had been exercised immediately prior to such reorganization, reclassification or other change, all subject to further adjustment as provided herein. At the request of Holder, this Warrant will thereupon be cancelled and upon its surrender to the Company, the Company will execute and deliver at its expense a new Warrant reflecting the foregoing adjustment, but otherwise identical to the replaced Warrant.

3.5 Notice of Adjustments and Record Dates. The Company shall promptly notify Holder in writing of each adjustment or readjustment of the Exercise Price hereunder and the number of shares of Series B-2 Preferred Stock issuable upon the exercise of this Warrant. Such notice shall state the adjustment or readjustment and show in reasonable detail the facts on which that adjustment or readjustment is based. In the event of any taking by the Company of a record of holders of shares of Series B-2 Preferred Stock for the purpose of determining holders thereof who are entitled to receive any dividend or other distribution, the Company shall notify Holder in writing of such record date at least ten (10) days prior to the date specified therein.

3.6 Fractional Shares. No fractional shares shall be issued upon the exercise of this Warrant as a consequence of any adjustment pursuant hereto. All shares of Series B-2 Preferred Stock (including fractions) issuable upon exercise of this Warrant may be aggregated for purposes of determining whether the exercise would result in the issuance of a fractional share. If, after aggregation, the exercise would result in the issuance of a fractional share, the Company shall, in lieu of issuance of any fractional share, pay Holder otherwise entitled to such fraction a sum in cash equal to the product resulting from multiplying the then current fair market value of a share of Series B-2 Preferred Stock (as determined in good faith by the Board of Directors of the Company) by such fraction.

3.7 Issue Tax. The issuance of certificates for the shares of Series B-2 Preferred Stock upon exercise of this Warrant shall be made without charge to Holder for any issuance tax in respect thereof provided that the Company shall not be required to pay any tax which may be payable in respect of any transfer involved in the issuance and delivery of any certificate in a name other than that of Holder.

3.8 No Impairment. The Company shall not avoid or seek to avoid the observance or performance of any of the terms to be observed or performed hereunder by the Company, but shall at all times in good faith assist in the carrying out of all the provisions of this Warrant. Without limiting the generality of the foregoing, the Company shall take all such action as may be necessary or appropriate in order that all shares of Series B-2 Preferred Stock as may be issued pursuant to the exercise of this Warrant shall, upon issuance, be duly and validly issued, fully paid and nonassessable and free from all taxes, liens and charges with respect to the issue thereof.

4. Replacement of Warrants. On receipt by the Company of evidence reasonably satisfactory to the Company of the loss, theft, destruction or mutilation of this Warrant and, in the case of any such loss, theft, destruction or mutilation of this Warrant, on delivery of an indemnity agreement reasonably satisfactory in form and amount to the Company or, in the case of any such mutilation, on surrender and cancellation of such Warrant, the Company at its expense shall execute and deliver to Holder, in lieu thereof, a new Warrant of like tenor.

5. No Rights or Liability as a Stockholder. This Warrant does not entitle Holder hereof to any voting rights or other rights as a stockholder of the Company. No provisions hereof, in the absence of affirmative action by Holder to purchase shares of Series B-2 Preferred Stock, and no enumeration herein of the rights or privileges of Holder, shall give rise to any liability of Holder as a shareholder of the Company.

6. Miscellaneous.

6.1 Limitations on Disposition. Holder agrees not to make any disposition of this Warrant or any shares of Series B-2 Preferred Stock issued upon exercise of this Warrant, unless and until (i) the transferee has agreed in writing for the benefit of the Company to be bound by this Section 6.1 and the other provisions of this Warrant as if such transferee were the original Holder hereof, provided and to the extent such provisions are then applicable, and (ii) such transfer is in compliance with all applicable securities laws.

6.2 Early Termination. In the event of, at any time during the Exercise Period, any capital reorganization, or any reclassification of the capital stock of the Company (other than a change in par value or from par value to no par value or no par value to par value or as a result of a stock dividend or subdivision, split-up or combination of shares), or the consolidation or merger of the Company with or into another corporation (other than a merger solely to effect a reincorporation of the Company into another state), or the sale or other disposition of all or substantially all the properties and assets of the Company in its entirety to any other person, the Company shall provide to Holder ten (10) days advance written notice of such reorganization, reclassification, consolidation, merger or sale or other disposition of the Company's assets, and this Warrant shall terminate (subject to the provisions of Section 6.3) unless exercised prior to the occurrence of such reorganization, reclassification, consolidation, merger or sale or other disposition of the Company's assets.

6.3 Automatic Conversion upon Expiration or Termination. In the event that, at the end of the Exercise Period or earlier termination of this Warrant pursuant to Section 6.2, the fair market value (as determined in good faith by the Board of Directors of the Company) of one share of Series B-2 Preferred Stock for which this Warrant is exercisable (or other security issuable upon the exercise hereof) is greater than the Exercise Price in effect on such date, then this Warrant shall automatically be deemed on and as of such date to be converted pursuant to Section 2.6 above as to all shares of Series B-2 Preferred Stock (or such other securities) for which it shall not previously have been exercised or converted, and the Company shall promptly deliver a certificate representing the shares of Series B-2 Preferred Stock (or such other securities) issued upon such conversion to the Holder.

6.4 Titles and Subtitles. The titles and subtitles used in this Warrant are for convenience only and are not to be considered in construing or interpreting this Warrant.

6.5 Notices. All notices and other communications under this Warrant shall be in writing and shall be deemed given upon receipt if delivered personally, or when sent if mailed by registered or certified mail (return receipt requested) or by reputable overnight express courier (charges prepaid) or transmitted by facsimile (with confirmation of transmittal) to the party to be notified at the address indicated for such party on the signature page hereof, or at such other address as such party may designate by advance written notice to the other parties.

6.6 Attorneys' Fees. If any action at law or in equity is necessary to enforce or interpret the terms of this Warrant, the prevailing party shall be entitled to reasonable attorneys' fees, costs and disbursements in addition to any other relief to which such party may be entitled.

6.7 Amendments and Waivers. This Warrant may be amended and the observance of any other term of this Warrant may be waived (either generally or in a particular instance and either retroactively or prospectively), with the written consent of the Company and the holders of at least a majority in interest of the shares issuable upon exercise of all then-outstanding Warrants. Any amendment or waiver effected in accordance with this Section 6.7 shall be binding upon Holder of this Warrant (and of any shares of Series B-2 Preferred Stock into which this Warrant is exercisable), and each future holder of all such securities and the Company.

6.8 Severability. If one or more provisions of this Warrant are held to be unenforceable under applicable law, such provision shall be excluded from this Warrant and the balance of the Warrant shall be interpreted as if such provision were so excluded and shall be enforceable in accordance with its terms.

6.9 Governing Law. This Warrant shall be governed by and construed and enforced in accordance with the laws of the State of California, without giving effect to its conflicts of laws principles.

[SIGNATURE PAGE FOLLOWS]

This Warrant may be executed in one or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

Date: _____, ____

ONCTERNAL THERAPEUTICS, INC.,
a Delaware corporation

By: _____
Name: James B. Breitmeyer, M.D., Ph.D.
Title: President and Chief Executive Officer

Address: 3525 Del Mar Heights Road #821
San Diego, CA 92130-2122

ACKNOWLEDGED AND AGREED:

INVESTOR

By:

By: _____
Name:
Title:

Address:

[SIGNATURE PAGE TO WARRANT TO PURCHASE
SHARES OF SERIES B-2 PREFERRED STOCK]

EXHIBIT A

FORM OF NOTICE OF EXERCISE

The undersigned, the holder of the within Warrant, hereby irrevocably elects to exercise this Warrant for, and to purchase thereunder, _____ shares of Series B-2 Preferred Stock (as defined in the attached Warrant)* of **ONCTERNAL THERAPEUTICS, INC.**, a Delaware corporation and herewith makes payment of $_____ therefor and requests that the certificates for such shares be issued in the name of, and delivered to, _____, federal taxpayer identification number _____, whose address is _____.

In exercising this Warrant, the undersigned hereby confirms and acknowledges that the _____ shares of Series B-2 Preferred Stock (as defined in the attached Warrant) are being acquired solely for the account of the undersigned and not as a nominee for any other party, and for investment, and the undersigned will not offer, sell or otherwise dispose of any such shares of Series B-2 Preferred Stock except under circumstances that will not result in a violation of the Securities Act of 1933, as amended, or any state securities laws.

Please issue a new Warrant for the unexercised portion of the attached Warrant in the name of, and delivered to, _____, federal taxpayer identification number _____, whose address is _____.

Dated:_____

_____
(Signature must conform to name of holder
as specified on the face of the Warrant)

*Insert here the number of shares as to which the Warrant is being exercised.

EXHIBIT B

FORM OF NET ISSUE ELECTION NOTICE

(To be signed only on net issue exercise of the Warrant)

The undersigned, the holder of the within Warrant, hereby irrevocably elects to exercise this Warrant with respect to _____ shares of Series B-2 Preferred Stock (as defined in the attached Warrant) of **ONCTERNAL THERAPEUTICS, INC.**, a Delaware corporation, pursuant to the net issue election provisions set forth in Section 2.6 of the Warrant and requests that the certificates for the number of shares of Series B-2 Preferred Stock issuable pursuant to said Section 2.6 after application of the net issue election formula to such shares of Series B-2 Preferred Stock be issued in the name of, and delivered to, _____, federal taxpayer identification number _____, whose address is _____.

In exercising this Warrant, the undersigned hereby confirms and acknowledges that the shares of Series B-2 Preferred Stock are being acquired solely for the account of the undersigned and not as a nominee for any other party, and for investment, and the undersigned will not offer, sell or otherwise dispose of any such shares of Series B-2 Preferred Stock except under circumstances that will not result in a violation of the Securities Act of 1933, as amended, or any state securities laws.

Please issue a new Warrant for the unexercised portion of the attached Warrant in the name of, and delivered to, _____, federal taxpayer identification number _____, whose address is _____.

Dated:_____

_____
(Signature must conform to name of holder
as specified on the face of the Warrant)

Exhibit 10.46

***CERTAIN MATERIAL (INDICATED BY THREE ASTERISKS IN BRACKETS) HAS BEEN OMITTED FROM THIS DOCUMENT BECAUSE IT IS BOTH (1) NOT MATERIAL AND (2) WOULD BE COMPETITIVELY HARMFUL IF PUBLICLY DISCLOSED.

AND

ROAR Therapeutics

Commercial License Agreement

Date: May 19, 2014

This Commercial License Agreement (this "**Agreement**") is made effective on May 19, 2014 (the "**Effective Date**")

by and between

Selexis SA, a company incorporated under the laws of Switzerland, with its registered office at 18 chemin des Aulx, 1228 Plan-les-Ouates, Geneva, Switzerland

("**SELEXIS**")

and

ROAR Therapeutics, a company incorporated under the laws of [state], with its office at [***], San Diego, CA 92130 ("**COMPANY**")

(SELEXIS and COMPANY, collectively the "**PARTIES**" and, individually, a "**PARTY**")

Preamble

A. WHEREAS, COMPANY is a biopharmaceutical company engaged in the research, development, manufacturing and sale of biopharmaceutical products;

B. WHEREAS, SELEXIS is a biotechnology company engaged in the development and sale of recombinant cell lines based on the SELEXIS Technology;

C. WHEREAS, SELEXIS is the owner of certain Confidential Information, the SELEXIS Know-How and the SELEXIS Patent Rights;

D. WHEREAS, pursuant to a services agreement between SELEXIS and PacificGMP dated May 21, 2012 (the "**Services Agreement**") SELEXIS has developed certain recombinant cell line(s) and/or SELEXIS Material using the SELEXIS Technology and COMPANY and PacificGMP have evaluated such cell line(s);

E. WHEREAS, PacificGMP has agreed to assign to COMPANY all rights obtained by PacificGMP under the Services Agreement, including the rights to obtain a license to commercialize products manufactured using the cell line(s) developed under the Services Agreement; and

F. WHEREAS, SELEXIS is willing to grant COMPANY, and COMPANY is willing to receive from SELEXIS, a license under the SELEXIS Know-How and the SELEXIS Patent Rights with respect to the SELEXIS Technology to use the cell line(s) developed under the Services Agreement, on the terms and conditions set forth in this Agreement.

Now, THEREFORE, the PARTIES agree as follows:

1. Definitions

In addition to the terms defined above, the following terms, whether used in the singular or plural, shall have the following meanings as used in this Agreement, unless otherwise specifically indicated:

1.1. "**Affiliate**" shall mean any Person that, as of the Effective Date, directly or indirectly, controls, is controlled by, or is under common control with the relevant Person. For the purposes of this definition only, "**control**" shall mean the possession, directly or indirectly, of the power to cause the direction of the management and policies of a Person, whether through ownership of voting securities of such Person, by contract or otherwise. A Person shall only be considered an Affiliate for so long as such Control exists.

1.2. "**BLA**" shall mean a Biologic License Application for the Final Product filed with the FDA or any comparable filing made with a Regulatory Authority in another country.

1.3. "**Calendar Quarter**" shall mean, for each Calendar Year, each of the three month periods ending March 31, June 30, September 30 and December 31 respectively.

1.4. "**Calendar Year**" shall mean the period commencing on January 1 and ending twelve (12) consecutive calendar months later on December 31.

1.5. "**Cell Line**" shall mean a mammalian cell line that is developed using the SELEXIS Technology. Cell Line shall include, without limitation, any COMPANY Cell Line(s).

1.6. "**Clinical Trials**" shall mean human studies designed to measure the safety and/or efficacy of the Product. Clinical Studies include Phase I Clinical Trials, Phase II Clinical Trials, and Phase III Clinical Trials.

1.7. "**Collaboration Partner**" shall mean a Third Party with which COMPANY collaborates on the development of the production process and/or commercialization of a Product or to which COMPANY has granted a license for the development of the production process and/or commercialization of a Product.

1.8. "**Combination Product Adjustment**" shall mean the adjustment of: Net Sales for any combination product done by multiplying actual Net Sales of such combination product by the fraction A/(A + B) where A is the weighted (by sales volume) average invoice price of the Product, if sold separately, and B is the weighted (by sales volume) average invoice price of any other active ingredient, device or component in the combination, if sold separately. If, on a country-by-country basis, the other active ingredient, device or component in the combination is not sold separately, Net Sales shall be calculated by multiplying actual Net Sales of the combination product in such country by the fraction A/C where A is the invoice price of the Product, if sold separately, in such country and C is the invoice price of the combination product in such country.

1.9. "**Commercial License**" shall have the meaning set out in Article 2.1.

1.10. "**Commercial License Option**" shall mean the option granted to Company in the Services Agreement to obtain a non-exclusive commercial license.

1.11. "**COMPANY Technology**" shall mean any Technology owned or controlled by COMPANY, including, without limitation, any such Technology related to License or Final Product, but excluding any SELEXIS Technology related thereto.

1.12. "**COMPANY Cell Line**" shall mean the mammalian cell line developed by SELEXIS and provided to PacificGMP and/or COMPANY pursuant to the Services Agreement and any progeny or derivatives thereof.

1.13. "**Confidential Information**" shall mean any technical and business information pertaining to materials and production techniques, products, processes and services, including without limitation physical working models and samples of the products, research, development, patentable and unpatentable inventions, manufacturing, purchasing and product development plans, forecasts, strategies and information, engineering, marketing, merchandising, selling, customer lists, customer prospects, software codes, algorithms, names and expertise of employees and consultants, blueprints, technical information, trade secrets or know-how or other related proprietary business information and data, in any case whether such information is provided in tangible or intangible form, written, oral, graphic, pictorial or recorded form or stored on computer discs, hard drives, magnetic tape or digital or any other electronic medium. Confidential Information disclosed in any tangible format will be labeled "**Confidential**" or words to similar effect, and all non-tangible disclosures will be declared to be "**Confidential**" or words to similar effect at the time of disclosure. Confidential Information shall include any and all material and data created by the receiving party based on, containing or otherwise reflecting Confidential Information. Confidential Information shall also include any such information or documents which may be disclosed hereunder which the disclosing party received in confidence from a Third Party.

1.14. "**Contract Manufacturing Organization**" shall mean an entity of which at least fifty percent (50%) of the business is directed toward the provision of services or products for non-affiliate third parties.

1.15. "**Contractor**" shall mean a Third Party contractor who: (i) develops the production process for Products by or on behalf of COMPANY or (ii) manufactures and supplies Products by using such production process by or on behalf of Company.

1.16. "**Default**" shall have the meaning set out in Article 9.2.

1.17. "**Defaulting Party**" shall have the meaning set out in Article 9.2.

1.18. "**FDA**" shall mean the United States Food and Drug Administration, or any successor agency.

1.19. "**Final Product**" shall mean any pharmaceutical preparation in final form containing any Licensed Products for sale by prescription, over-the-counter or any other method, in any dosage form, formulation, presentation, line extension or package configurations, including without limitation such Product in development where the context so requires in this Agreement.

1.20. "**First Commercial Sale**" shall mean, with respect to any Final Product in any country, the first sale of such Final Product for use or consumption by the general public in such country after Regulatory Approval as well as Pricing and Reimbursement Approval for such Final Product has been obtained in such country. For the avoidance of doubt, sales prior to receipt of all Regulatory Approvals and Pricing and Reimbursement Approvals necessary to commence regular commercial sales, such as so-called "treatment IND sales", "named patient sales" and "compassionate use sales", shall not be construed as a First Commercial Sale.

1.21. "**Force Majeure**" shall mean conditions beyond the control of a PARTY, including without limitation, an act of God, war, civil commotion, terrorist act, labor strike or lock-out, epidemic, failure or default of public utilities or common carriers, destruction of facilities or materials by fire, earthquake, storm or the like catastrophe, and failure of plant or machinery (provided that such failure could not have been prevented by the exercise of skill, diligence and prudence that would be reasonably and ordinarily expected from a skilled and experienced person engaged in the same type of undertaking under the same or similar circumstances).

1.22. "**IND**" shall mean an Investigational New Drug Application for the Product filed with the FDA or any comparable filing made with a Regulatory Authority in another country.

1.23. "**Insolvent Party**" shall have the meaning set out in Article 9.3.

1.24. "**Invention**" shall mean any invention, idea, innovation, enhancement, improvement or feature, whether or not patentable or registrable, together with any intellectual property rights relating thereto (including without limitation the Patent Rights and rights to confidentiality and proprietary information).

1.25. "**Know-How**" shall mean information in whatever form, tangible or intangible and on whatever medium, including without limitation, information and materials relating to Inventions and other know-how, trade secrets, data (including without limitation all data from pre-clinical and clinical studies and other studies intended for regulatory submission), results, formulae, DNA and amino acid sequence information and developments.

1.26. "**Licensed Field of Use**" shall mean the development, manufacture and sale of Final Products for any field of use.

1.27. "**Licensed Product**" shall mean the recombinant protein listed in Exhibit 2.

1.28. "**Losses**" shall mean all and any liability, damage, loss or expense.

1.29. "**Net Sales**" shall mean the amount collected by COMPANY, its Affiliates and/or its sublicensees on account of sales of Final Product to Third Parties in the Territory, less the following deductions:

(i) sales and excise taxes and duties paid or allowed by the selling PARTY and any other governmental charges imposed upon the production, importation, use or sale of the Final Products;

(ii) customary trade, quantity and cash discounts allowed on Final Products;

(iii) compulsory government rebates;

(iv) allowances or credits to customers on account of rejection or return of Final Product or on account of retroactive price reductions affecting the Final Product;

(v) freight and insurance costs, if they are included in the selling price for the Final Product invoiced to Third Parties, provided always that such deduction shall not be greater than the balance between the selling price actually invoiced to the Third Party and the standard selling price which would have been charged to such Third Party for such Final Product exclusive of freight and insurance in the respective country or in a comparable country; and

(vi) in the event that a Final Product is sold in any country in the form of a combination product containing one or more other therapeutically active ingredients, the Net Sales for any such Final Product shall be computed using the Combination Product Adjustment for such country.

1.30. "**Non-Defaulting Party**" shall have the meaning set out in Article 9.2.

1.31. "**Notice of Default**" shall have the meaning set out in Article 9.2.

1.32. "**Patent Rights**" shall mean any and all of the following: (i) patent applications (including without limitation provisional patent applications) and patents (including without limitation the inventor's certificates); (ii) any substitution, extension (including without limitation patent term extensions and supplementary protection certificates), registration, confirmation, reissue, continuation, divisional, continuation-in-part, re-examination, renewal, patent of addition or the like thereof or thereto; (iii) any foreign counterparts of any of the foregoing; and (iv) any utility model applications and utility models (whether or not corresponding to any of the foregoing).

1.33. "**PacificGMP**" shall mean PacificGMP, a company incorporated under the laws of State of California, with its registered office at 8810 Rehco Road, Suite E, San Diego, CA 92121 USA.

1.34. "**Person**" shall mean an individual, a partnership, a joint venture, a corporation, a limited liability company, a trust, an estate, an unincorporated organization, or any other entity, or a government or any department or agency thereof, whether acting in an individual, fiduciary or other capacity.

1.35. "**Phase I Clinical Trial**" shall mean a Clinical Trial conducted in humans which is principally intended to obtain data on the safety, tolerability, pharmacokinetic or pharmacodynamic properties of a product. Phase I shall be deemed to have been initiated

when the first patient in the study has been treated. Phase I shall be deemed to have completed when the last patient has completed his or her treatment being investigated by that Clinical Trial as described in its protocol, the database is locked, and data from all patients, according to protocol, has been analyzed for the primary endpoint.

1.36. "**Phase II Clinical Trial**" shall mean a Clinical Trial conducted in humans in which a primary objective is a preliminary determination of therapeutic efficiency and/or to find an optimal dose range in patients with the disease target being studied. Phase II shall be deemed to have been initiated when the first patient in the study has been treated. Phase II shall be deemed to have completed when the last patient has completed his or her treatment being investigated by that Clinical Trial as described in its protocol, the database is locked, and data from all patients, according to protocol, has been analyzed for the primary endpoint.

1.37. "**Phase III Clinical Trial**" shall mean a Clinical Trial conducted in humans in which a primary objective is a determination of therapeutic efficiency in patients with the disease target being studied. Phase III shall be deemed to have been initiated when the first patient in the study has been treated. Phase III shall be deemed to have completed when the last patient has completed his or her treatment being investigated by that Clinical Trial as described in its protocol, the database is locked, and data from all patients, according to protocol, has been analyzed for the primary endpoint.

1.38. "**Price and Reimbursement Approval**" shall mean any approvals, licenses, registrations or authorizations of any supranational, national, regional, state or local Regulatory Authority or other regulatory agency, department, bureau or governmental entity, necessary to determine or set the pricing of a Product, and/or its reimbursement level by the relevant health authorities, providers or other funding institutions, at supranational, national, regional, state or local level.

1.39. "**Regulatory Approval**" shall mean any approvals, licenses, registrations or authorizations of any supranational, national, regional, state or local Regulatory Authority or other regulatory agency, department, bureau or governmental entity, necessary for the manufacture, marketing or sale of a Product or conduct of Clinical Trials in a regulatory jurisdiction, excluding Price and Reimbursement Approval.

1.40. "**Regulatory Authority**" shall mean (i) the FDA or (ii) any and all governmental or supranational agencies, ministries, authorities or other bodies with similar regulatory authority with respect to approval or registration of pharmaceutical or biologic products in any other jurisdiction anywhere in the world.

1.41. "**Royalty Term**" shall mean with respect to each Final Product sold in a particular country, the period beginning on the date of the First Commercial Sale in such country and terminating on [***].

1.42. "**SELEXIS Know-How**" shall mean SELEXIS' Confidential Information and Know-How owned, controlled by SELEXIS, or to which SELEXIS has received a license which includes a right to grant sublicenses consistent with the Commercial License relating to,

without limitation, the construction and development of recombinant cell lines for the manufacture of biopharmaceutical products and existing as of the Effective Date or obtained thereafter during the Term.

1.43. "**SELEXIS Materials**" shall mean the materials provided by SELEXIS to COMPANY under this Agreement and all modifications and improvements thereof made by SELEXIS during the Term.

1.44. "**SELEXIS Patent Rights**" shall mean Patent Rights which: (i) are owned or controlled by SELEXIS, or to which SELEXIS has received a license which includes a right to grant sublicenses consistent with the Commercial License (ii) are necessary or useful for the use of SELEXIS Materials or the construction, development and use of Cell Lines and (iii) are existing as of the Effective Date or obtained thereafter during the Term. Without limiting the generality this Article, the SELEXIS Patent Rights as of the Effective Date are listed in Exhibit 1 hereto.

1.45. "**SELEXIS Technology**" shall mean the SELEXIS Patent Rights, the SELEXIS Know-How and the SELEXIS Materials.

1.46. "**Tax Authority**" shall mean the relevant governing tax authority as defined in Article 4.2.

1.47. "**Taxes**" shall mean all excises, taxes and duties with the exception of VAT.

1.48. "**Technology**" shall mean all inventions (whether or not patentable or patented) and intellectual property rights therein, including without limitation, patents, patent applications, know-how, trade secrets, copyrights, trademarks, designs, concepts, registered and unregistered design rights, data, work product, results, reports, improvements, business and research plans, analytic methods and results, experimental methods and results, manufacturing processes, developments, technologies, technical information, composites of genes and gene constructs, cell lines, manuals, standard operating procedures, instructions and specifications.

1.49. "**Term**" shall have the meaning set out in Article 9.1.

1.50. "**Territory**" shall mean the entire world.

1.51. "**Third Party**" shall mean a Person other than SELEXIS, COMPANY or an Affiliate of SELEXIS or COMPANY.

1.52. "**Transferee**" shall have the meaning set out in Article 2.3.

1.53. "**Valid Claim**" shall mean any issued or granted claim of the SELEXIS Patent Rights that has not been revoked or held unenforceable or invalid by a decision of a court or other governmental agency of competent jurisdiction, that is unappealable or remains unappealed at the end of the time allowed for appeal, or that has not been disclaimed, denied or admitted to be invalid or unenforceable through reissue, re-examination, disclaimer or otherwise.

1.54. "**VAT**" shall mean value added tax and any other similar turnover, sales or purchase, tax or duty levied by any other jurisdiction whether central, regional or local.

2. Commercial Licenses

2.1. Commercial Licenses. Subject to payment by COMPANY of the amounts provided for below and COMPANY'S compliance with the other terms and conditions of this Agreement, SELEXIS hereby grants to COMPANY a non-exclusive license under the SELEXIS Patent Rights and SELEXIS Know-How, in the Territory, with the limited right to sublicense in accordance with Article 2.2, to use Cell Lines and SELEXIS Materials for the manufacture of Licensed and/or Final Products in the Licensed Field of Use and to make, have made, use, offer for sale, sell, import and otherwise exploit Final Products, including, without limitation, the use of Licensed and Final Products in Clinical Trials (the "**Commercial License**").

2.2. Sublicenses. COMPANY may, with prior written consent from SELEXIS, which consent will not be unreasonably withheld, grant sublicenses under the Commercial License to a Contractor or to a Collaboration Partner (the "**Sublicensees**") and only with respect to (i) the establishment of a production process for a Licensed or Final Product for or on behalf of COMPANY or (ii) the manufacture, distribution or sale of a Licensed or Final Product for or on behalf of COMPANY. Notwithstanding the foregoing, for any such Sublicensee which will be only distributing and/or selling Licensed or Final Product and which will not be receiving any Cell Line or any SELEXIS Materials or SELEXIS Know-How (or given access to any of the foregoing), COMPANY may grant such sublicense on prior written notice to SELEXIS. Any sublicense granted under this Agreement shall require that the Sublicensees adhere to all relevant provisions of this Agreement. Notwithstanding the above, COMPANY is and remains fully liable and responsible for any breach of this Agreement committed or any Losses caused by any Sublicensee, or any other Third Party or Affiliate to whom the Cell Lines, SELEXIS Materials and the SELEXIS Know-How or parts thereof are made available under any such sublicense.

2.3. Transfer of SELEXIS Materials. COMPANY shall not transfer the Cell Lines, SELEXIS Materials or SELEXIS Know-How to any Third Party, except that during and for the Term only, COMPANY may transfer SELEXIS Know-How to Contractors or Collaboration Partners (the "**Transferees**") solely for their use in connection with their performance of the manufacturing of Products in the Licensed Field of Use with, or on behalf of, COMPANY. If COMPANY makes any such transfer, it shall notify SELEXIS within 30 days of any such transfer and report the name and address of any Transferee together with confirmation that the Transferee has agreed in writing to adhere to the confidentiality obligations and use restrictions set out in this Agreement.

3. Consideration

3.1. Payments. Subject to Article 3.6, COMPANY shall pay to SELEXIS the amounts as set forth below.

3.1.1. Commercial License Execution Payment. As partial consideration for the rights and licenses granted by SELEXIS to COMPANY under this Agreement, COMPANY shall pay SELEXIS a one-time fee of [***], due upon execution of this Agreement.

3.1.2. Commercial License Milestone Payments. As partial consideration for the rights and licenses granted by SELEXIS to COMPANY under this Agreement, COMPANY shall make the following milestone payments to SELEXIS with respect to the first occurrence of each such milestone event for each Licensed Product:

(i) upon initiation of the first Phase II Clinical Trial for the first Final Product containing Licensed Product: [***];

(ii) upon completion of the first Phase II Clinical Trial for the first Final Product containing the Licensed Product: [***];

(iii) upon filing of BLA for the first final Product containing the Licensed Product: [***]; and

(iv) upon First Commercial Sale of the first Final Product containing Licensed Product: [***].

3.1.3. Commercial License Royalty Payments: In addition to the milestone payments under Article 3.1.2, during the Royalty Term COMPANY shall pay SELEXIS on a Product-by-Product and country-by-country basis a royalty of [***]percent ([***]%) of Net Sales of all Final Products sold worldwide. Where royalties are due for the sale of Final Products directly by COMPANY such royalties shall be paid for each Calendar Quarter within thirty (30) days of the end of that Calendar Quarter. Where royalties are due for the sales of Final Product by a Sublicensee, payment shall be made within forty-five (45) days of the end of that Calendar Quarter. For the avoidance of doubt, no royalty payments shall be due for a Final Product in a specific country after the Royalty Term has expired for such Final Product in such country. Where royalties are no longer due in accordance with the foregoing, the Commercial License granted to COMPANY under this Agreement shall become perpetual, irrevocable, fully paid up and royalty free with respect to such Final Product in such country.

3.2. Mechanism of Payment. The payments due to SELEXIS under this Agreement shall be made by wire transfer or electronic fund transfer to the credit and account of SELEXIS as follows:

Bank Name: [***]

Account: [***]

To: Selexis S.A. 18,
chemin des Aulx
1228 Plan-les-Ouates
Geneva, Switzerland

3.3. Payment Terms. Except with respect to royalties due pursuant to Article 3.1.3, COMPANY shall make payments due to SELEXIS under this Agreement at the latest [***] business days after receipt of invoice. All fees and payments, including without limitation under Article 3.1.3, do not include any applicable VAT or Taxes.

3.4. Records. COMPANY and its Affiliates and Sublicensees shall keep true accounts of Net Sales of Licensed Products and COMPANY shall deliver to SELEXIS at the same time as the payments due under Article 3.1.3. a written account, including quantities of Net Sales of each such Licensed Product, broken down on a country-by-country basis with respect to those payments. SELEXIS is entitled to have such accounts audited by an independent expert of its choice. Such independent expert shall be bound by confidentiality terms at least as restrictive as the terms of Article 8 and shall be authorized to disclose to SELEXIS only the results of its audit. COMPANY shall provide access to all information reasonably requested by such expert. The cost of any audit shall be borne by SELEXIS unless the audit shows that COMPANY underpaid SELEXIS by more than 2% of the amounts due in which case the cost of the audit shall be borne by COMPANY.

3.5. Single Royalty and Milestone. For Final Products covered by more than one SELEXIS Patent Rights, COMPANY will make one payment to SELEXIS for royalties on any unit of Final Product sold by COMPANY or Sublicensees, irrespective of how many SELEXIS Patent Rights may cover such Final Product. Each milestone described in Article 3 shall be payable only once in relation to each Licensed Product, irrespective of the number of Final Products which incorporate that Licensed Product and undergo the events triggering the payment. All fees and payments, including without limitation under Article 3.1, do not include any applicable VAT or Taxes.

3.6. Buy-Out Option. COMPANY may choose to replace certain of the milestone payments and royalty payments as set forth in Article 3.1 in its discretion. If COMPANY so chooses, it will notify SELEXIS in writing of its decision at any time prior to the first filing of BLA for the first final Product containing the Licensed Product. Thereafter, prior to or immediately upon filing of the first BLA for the first Final Product containing the Licensed Product, COMPANY will make a one time, non-refundable payment to SELEXIS of [***]. Subject to the receipt of the notice set forth above in this Article, and the receipt by SELEXIS of the foregoing payment, COMPANY shall be relieved of its obligations to pay the milestone payments set forth in Articles 3.1.2(iii) and 3.1.2(iv), and the royalties as set forth in Article 3.1.3. For purposes of clarification, the foregoing will not relieve COMPANY from its obligation to pay any amounts when due as set forth in Articles 3.1, 3.1.2(i), and 3.1.2(ii), nor will it entitle COMPANY to any refund of such amounts. If COMPANY fails to so notify SELEXIS in writing, then the original terms as set forth in Article 3.1 will apply.

4. Taxes

4.1. General. All Taxes levied on account of any payment made by COMPANY to SELEXIS pursuant to this Agreement (other than Taxes on income, gains or profits levied against SELEXIS by any competent Swiss tax authority) will be the responsibility of, and shall be paid by, COMPANY pursuant to Article.

4.2. Character of Payments. The PARTIES agree that, for purposes of determining the applicability of any Taxes, the payments to be made under this Agreement constitute payments for tangible property and license of intellectual property. However, in the event that the governing tax authority (the "**Tax Authority**") qualifies differently such payment, any additional taxes that may be applied (including without limitation any interests and penalties that may be unpaid) shall be paid by COMPANY.

4.3. Withholding by COMPANY.

(i) All payments by COMPANY hereunder shall be made in full without any deduction or withholding whatsoever and free and clear of and without any deduction or withholding for or on account of any Taxes, except to the extent that any such deduction or withholding is required by law in effect at the time of payment. Subject to paragraph (ii) of this Article, if any Taxes or amounts with respect to Taxes must be deducted or withheld, or any other deductions or withholdings must be made, from any amounts payable or paid by COMPANY, COMPANY shall pay such additional amounts as may be necessary to ensure that SELEXIS receives and retains (after any deduction or withholding with respect to such additional amount) a net amount equal to the full amount which it would have received had payment not been made subject to Taxes or any other deduction or withholding.

(ii) COMPANY is not required to pay any additional amounts pursuant to paragraph (i) of this Article with respect to any deduction or withholding which would not have been required if SELEXIS had completed a declaration, claim, exemption or other form, subject to reasonable commercial efforts.

5. Intellectual Property

5.1. Ownership. Each PARTY shall retain all right, title and interest in and to its Inventions and Know-How which exist on the Effective Date or which are thereafter developed independently of the performance of this Agreement.

5.2. COMPANY and SELEXIS Inventions. Any Invention developed hereunder by or for either Party, solely or jointly with the other PARTY or any Affiliate or agent thereof, shall belong exclusively (i) to COMPANY, to the extent it relates specifically to any COMPANY Technology, including, without limitation, any improvement or modification thereto ("**COMPANY Invention**")**;** or (ii) to SELEXIS, to the extent it relates specifically to any SELEXIS Technology, including, without limitation, any improvements or modifications thereto ("**SELEXIS Invention**"). Any SELEXIS Inventions shall be included within the scope of the SELEXIS Technology licensed to COMPANY under this Agreement as provided for in Article 5.5. Notwithstanding the foregoing, such ownership shall not be construed to transfer to either PARTY ownership of or any license or other rights in or to any of such PARTY'S underlying Technology which may be included or embodied therein, or useful or necessary to use in connection with exploiting such Invention.

5.3. Other Inventions. Except as set forth in Article 5.2, any other Invention developed hereunder solely by COMPANY shall be COMPANY'S sole property and any other

Invention developed hereunder solely by SELEXIS shall be SELEXIS' sole property. The PARTIES do not anticipate that there will be any jointly developed Inventions hereunder, but if there are any other such jointly developed Inventions which do not relate to either the SELEXIS Technology or the COMPANY Technology, such Inventions shall be owned jointly by COMPANY and SELEXIS ("**Joint Inventions**"). In the event any such Joint Inventions arise, the PARTIES will use commercially reasonable efforts to cooperate to protect and/or exploit such Joint Inventions, including, without limitation, by sharing in costs incurred with protection of such Joint Inventions and sharing in revenues generated by the use or sublicense of the Joint Inventions.

5.4. Notification. Each PARTY shall promptly notify the other PARTY of any Invention arising in connection with this Agreement provided that COMPANY has no obligation to notify SELEXIS with respect to any COMPANY Inventions developed solely by COMPANY.

5.5. Improvements. In the event SELEXIS possesses, acquires, creates or is licensed (with the right to grant a sublicense consistent with the terms of the Commercial License) any improvements to the SELEXIS Technology which are necessary or useful for COMPANY to use in connection with the use of the Cell Lines as licensed hereunder, such improvements shall automatically be included in the SELEXIS Patent Rights and/or the SELEXIS Know-How and thereby disclosed and licensed at no extra cost to COMPANY in accordance with this Agreement; provided, however, that any rights granted by the foregoing will be subject to COMPANY'S compliance with any bona fide obligations owed to Third Parties (with respect to which SELEXIS has notified COMPANY), including, without limitation, and royalty obligations owed to Third Parties.

5.6. Third Party Patent Rights. SELEXIS covenants that if SELEXIS becomes aware that COMPANY'S use of the SELEXIS Technology in accordance with the terms hereunder would or would likely infringe any Third Party proprietary rights, SELEXIS shall use its reasonable commercial efforts to resolve such potential infringement at SELEXIS' cost to ensure COMPANY'S freedom to continue to exercise the licenses granted under this Agreement, including without limitation by using its reasonable commercial efforts to obtain a license from the Third Party owner of the proprietary rights which entitles SELEXIS to continue to grant the rights to COMPANY as provided for herein. Should such efforts not be successful, SELEXIS shall inform COMPANY in writing and thereafter either PARTY may terminate this Agreement with immediate effect, save that SELEXIS shall not have such right if COMPANY agrees to waive any liability SELEXIS would otherwise have to COMPANY hereunder with respect to the infringement of such Third Party proprietary rights. The obligations set forth in this Article relate solely to Third Party rights related specifically and solely to the SELEXIS Technology or SELEXIS Materials licensed hereunder, and do not apply with respect to any other technology or materials used by COMPANY at its discretion in connection with its exercise of the license rights granted hereunder, and specifically exclude any such Third Party rights to the extent relating to the Licensed Product(s) produced by any Cell Lines hereunder.

5.7. Enforcement of SELEXIS Patent Rights. If, during the Term, either PARTY becomes aware of any infringement or potential infringement of the SELEXIS Technology it shall promptly notify the other PARTY in writing and the PARTIES shall consult with each other to decide the best way to respond to such infringement or misuse, provided that SELEXIS shall remain free to take any action as it deems fit in its sole discretion.

5.8. COMPANY Publications. COMPANY shall have the unrestricted right to publish or otherwise disclose the results and data obtained by the practice of the SELEXIS Technology in accordance with the terms hereof, provided such publication or disclosure does not include any Confidential Information of SELEXIS. The name of SELEXIS shall be given proper recognition in such publication(s) as scientifically appropriate.

5.9. Further Assurance. Each PARTY agrees to execute and do all things at the cost of the other PARTY (if not specifically agreed otherwise) as the other PARTY may reasonably require to give that other PARTY the full benefit of the provisions of this Article 5.

6. Representations, Warranties, and Covenants

6.1. General. Except for the representations, warranties and covenants contained in this Article 6, the PARTIES do not make any other representations, nor give any other warranties, express or implied, nor undertake to any other covenants. The PARTIES expressly exclude any and all other representations, warranties and covenants.

6.2. Representations and Warranties by the PARTIES. Each PARTY hereby represents and warrants to the other PARTY that:

6.2.1. Corporate Power. It is duly organized and validly existing under the laws of the state (or country or other jurisdiction, as the case may be) of its incorporation and has full corporate power and authority to enter into this Agreement and to carry out the provisions hereof.

6.2.2. Due Authorization. It is duly authorized to execute and deliver this Agreement and to perform its obligations hereunder and the persons executing this Agreement on its behalf have been duly authorized to do so by all requisite corporate actions.

6.2.3. Binding Agreement. This Agreement is a legal and valid obligation binding upon it and is enforceable in accordance with its terms, except as enforceability may be limited by bankruptcy, fraudulent conveyance, insolvency, reorganization, moratorium and other laws relating to or affecting creditors' rights generally and by general equitable principles and public policy.

6.2.4. No Conflicts. The execution, delivery and performance of this Agreement by it does not conflict with any agreement, instrument or understanding, oral or written, to which it is a PARTY or by which it may be bound.

6.2.5. Intellectual Property Rights. Each PARTY represents that it has valid and sufficient arrangements and agreements with its directors, officers and employees (which term shall include agents, consultants and subcontractors) such that ownership of intellectual property rights in and to any Inventions made by its directors, officers and employees vests in such PARTY.

6.3. Additional Representations and Warranties by SELEXIS. SELEXIS hereby represents and warrants that, to the best of its knowledge, as of the Effective Date:

6.3.1. There is no pending litigation asserting that the use of the SELEXIS Technology or the SELEXIS Know-How constitutes an infringement or misappropriation of any intellectual property rights of a Third Party; and

6.3.2. SELEXIS has the right in and to the SELEXIS Technology, SELEXIS Know-How and the SELEXIS Patents to grant COMPANY the rights which are granted to COMPANY under this Agreement.

6.4. Additional Warranties by COMPANY. COMPANY hereby represents and warrants to SELEXIS that:

6.4.1. There are no Third Party intellectual property rights or any other rights that may be asserted against SELEXIS claiming that SELEXIS was or is directly infringing or is helping or assisting COMPANY in infringing such Third Party's rights in connection with COMPANY'S exercise of the Commercial License granted by SELEXIS hereunder (except to the extent that any such Third Party rights relate solely and specifically to the SELEXIS Technology and/or SELEXIS Materials), including, without limitation, the development, manufacture and commercialization of Licensed Products and/or Final Products as permitted hereunder; and

6.4.2. As of the Effective Date, to the best of its knowledge, there is no litigation pending against COMPANY in connection with the use or ownership of the Licensed Product, including, without limitation, the infringement or misappropriation of any intellectual property rights of a Third Party relating to the Licensed Product, and COMPANY has not received any written claim that the use thereof infringes on any intellectual property rights of a Third Party or a request or demand from any Third Party for the licensing of any intellectual property rights to such Third Party in connection with the use of the Licensed Product.

6.4.3. COMPANY will not knowingly misappropriate or infringe the intellectual property or other rights of any Third Party in connection with its exercise of its licensed rights hereunder, including, without limitation, use of any SELEXIS Technology, Cell Line, or development, manufacture or sale of Licensed and/or Final Product hereunder, and understands and agrees that SELEXIS will have no liability whatsoever for any such misappropriation or infringement to the extent they do not relate solely and specifically to the use of the SELEXIS Technology and/or SELEXIS Materials hereunder.

6.5. Disclaimer of Warranties by SELEXIS. EXCEPT AS EXPRESSLY SET FORTH IN THIS AGREEMENT AND WITHOUT LIMITING THE GENERALITY OF ARTICLE 6.1, SELEXIS DOES NOT MAKE NOR GIVE ANY REPRESENTATION OR WARRANTY TO COMPANY OF ANY NATURE, EXPRESS OR IMPLIED, THAT THE SELEXIS TECHNOLOGY WILL BE USEFUL FOR, OR ACHIEVE ANY PARTICULAR RESULTS AS A RESULT OF ANY USE THEREOF BY SELEXIS OR BY COMPANY PURSUANT TO ANY LICENSE GRANTED TO COMPANY UNDER THIS AGREEMENT. EXCEPT AS EXPRESSLY SET FORTH IN THIS AGREEMENT,

SELEXIS SPECIFICALLY DISCLAIMS ANY WARRANTY OF NONINFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

7. Liability and Indemnification

7.1. Indemnification by SELEXIS. During the Term of this Agreement and thereafter, SELEXIS hereby agrees to save, defend and hold COMPANY, its Affiliates, and their respective officers, directors, employees, consultants and agents harmless from and against any and all Losses resulting directly from (i) any Third Party claim alleging that Customer's use of the SELEXIS technology and/or the SELEXIS Materials in strict accordance with the terms of this Agreement infringes or misappropriates such Third Party's intellectual property or other property right (except to the extent such claim relates to the use of the SELEXIS Technology and/or SELEXIS Materials in combination with any technologies or materials not supplied by SELEXIS or any modifications made by anyone other than SELEXIS to the SELEXIS Technology or SELEXIS Materials); or (ii) any material breach of SELEXIS' representations, warranties and covenants set forth in Article 6; except in each case to the extent that such Losses were caused by willful misconduct or gross negligence of COMPANY or any of its Affiliates, Collaborators or Sublicensees. In the event COMPANY seeks indemnification under this Article 7.1. COMPANY shall notify SELEXIS of any claim as soon as reasonably practicable after it receives notice of the claim. COMPANY shall allow SELEXIS to conduct and control the defense against the claim (including without limitation to settle the claim solely for monetary consideration), shall (at SELEXIS' expense) execute and deliver such documents and other papers and take such further actions as may be reasonably required to defend against the claim (including without limitation to settle the claim solely for monetary consideration) and shall (at SELEXIS' expense) cooperate as requested by SELEXIS in the defense of the claim, provided always that SELEXIS may not settle any such claim or otherwise consent to an adverse judgment or order in any relevant action or other proceeding which includes any admission as to liability or fault without the prior express written consent of COMPANY, which consent will not be unreasonably withheld.

7.2. Indemnification by COMPANY. During the Term of this Agreement and thereafter, COMPANY hereby agrees to save, defend and hold SELEXIS and its officers, directors, employees. consultants and agents harmless from and against any and all Losses resulting from (i) Third Party claims in connection with personal injury or damages to property caused by the Licensed Products and/or Final Products, including, without limitation, any product liability claims however stated; (ii) Third Party claims relating to any use of the Cell Lines. SELEXIS Technology and/or SELEXIS Materials outside the scope of the license granted herein or otherwise not in strict compliance with the terms hereof, or any use of the Cell Lines, SELEXIS Technology and/or SELEXIS Materials in conjunction with technology or materials not provided by SELEXIS, or any modifications to the SELEXIS Technology and/or SELEXIS Materials (except in each of the foregoing cases to the extent SELEXIS is obligated to indemnify COMPANY pursuant to Article 8.1 above); or (iii) any material breach of COMPANY'S representations, warranties and covenants set forth in Article 6; in each case, except to the extent that such Losses result from the willful misconduct or gross negligence of SELEXIS. In the event SELEXIS seeks indemnification under this Article, SELEXIS shall notify COMPANY of any claim as soon as reasonably practicable after it receives notice of the claim. SELEXIS shall allow COMPANY to assume direction and control of the defense of the claim (including without limitation the right to settle the claim solely for monetary consideration), and shall (at COMPANY'S expense) execute and deliver such documents and other papers and take such further actions as may be reasonably required to defend against the claim (including without limitation to settle the claim solely for monetary consideration). SELEXIS shall (at COMPANY'S expense) cooperate as requested by COMPANY in the defense of the claim, provided always that COMPANY may not settle any such claim or otherwise consent to an adverse judgment or order in any relevant action or other proceeding which includes any admission as to liability or fault without the prior express written consent of SELEXIS, which consent will not be unreasonably withheld.

7.3. No Incidental or Consequential Damages. In no event shall either PARTY be responsible for any incidental or consequential damages, including without limitation, lost profits or opportunities; provided that the foregoing shall in no event limit a PARTY'S indemnification obligation under Article 7.1 or Article 7.2.

7.4. Limitation of Liability. SELEXIS' cumulative liability under this Agreement, whether in contract, in tort, or otherwise, shall in no event exceed the aggregate consideration paid by COMPANY to SELEXIS under this Agreement.

8. Confidentiality

8.1. Non-disclosure. During the Term of this Agreement and for five (5) years thereafter, each PARTY shall keep Confidential Information of the other PARTY confidential and shall not (i) use the other PARTY'S Confidential Information for any purpose not expressly permitted under this Agreement, nor (ii) disclose the other PARTY'S Confidential information to any Person other than those of its agents, employees, and consultants (collectively, "**Representatives**") who need to know such Confidential Information for a use or purpose expressly permitted under this Agreement. Any such Representative who receives Confidential Information pursuant to this Article 8.1 shall be bound by written obligations of confidentiality and non-use with respect to the Confidential Information that are no less stringent than the obligations set forth in this Agreement.

8.2. Exceptions. The confidentiality obligations set forth in Article 8.1 shall not apply to Confidential Information that (i) is, or becomes, public information other than as the result of the violation of this Agreement or other act or omission by the receiving PARTY or its Representatives; (ii) was lawfully known to the receiving PARTY or its Representatives without restriction on use or disclosure at the time of disclosure hereunder; (iii) is hereafter lawfully received by the receiving PARTY or its Representatives from a Third Party authorized to make such disclosure and without restriction on use or disclosure; or (iv) is approved for release by prior written consent from the disclosing Party.

8.3. Authorized Disclosures. Notwithstanding any provision of this Agreement to the contrary,-each PARTY may disclose Confidential Information of the other PARTY to the extent such disclosure is required by law, provided however that the receiving PARTY gives the disclosing PARTY reasonable prior written notice to enable the disclosing PARTY to take appropriate measures to protect its Confidential Information and fully cooperates, subject to commercially reasonable efforts, with the disclosing PARTY to prevent or limit to the greatest extent possible the disclosure of Confidential Information.

8.4. Use of Name. No right, express or implied, is granted to either PARTY by this Agreement to use in any manner any trademark or trade name of the other PARTY including the names "**ROAR Therapeutics**" and "**SELEXIS**" without the prior written consent of the PARTY entitled to such trademark or trade name.

9. Term and Termination

9.1. Term. This Agreement is effective as of the Effective Date. Unless earlier terminated pursuant to Articles 9.2, 9.3 or 9.4 of this Agreement shall remain in full force and effect until expiration of the last-to-expire of the SELEXIS Patent Rights (the "**Term**").

9.2. Termination for Default. In addition to any other remedies which may be available at law or equity. in the event of any material breach of this Agreement (the "**Default**") by a PARTY (the "**Defaulting Party**"), **the** PARTY not in default (the "**Non-Defaulting Party**") shall have the right to give the Defaulting Party a written notice thereof (the "**Notice of Default**"), which must state the nature of the Default in reasonable details and request that the Defaulting Party cure such Default within sixty (60) days. If such Default is not cured within sixty (60) days after receipt of a Notice of Default by the Defaulting Party or if such Default cannot be cured, the Non-Defaulting Party may, at its sole discretion, terminate this Agreement by written notice effective upon receipt.

9.3. Termination for Bankruptcy. In the event that a PARTY shall become insolvent or make any arrangement with its creditors or has a receiver or administrator appointed to the whole or any part of its assets or if an order shall be made or a resolution passed for its winding up unless such order or resolution is part of a scheme for its amalgamation or reconstruction (the "**Insolvent Party**"), the other PARTY shall have the right, at its sole discretion, to serve immediate notice of termination of this Agreement, effective upon receipt.

9.4. Termination by COMPANY. COMPANY may terminate this Agreement at any time by giving sixty (60) days written notice to SELEXIS.

9.5. Consequences of Expiration or Termination.

9.5.1. Termination of Licenses. In the event of a termination of this Agreement by COMPANY pursuant to Article 9.2 or 9.4 or by SELEXIS pursuant to Article 9.2 or 9.3, all and any rights and licenses granted under this Agreement shall terminate upon termination of this Agreement except for the licenses which have become perpetual pursuant to Article 3.1.3.

9.5.2. SELEXIS Technology and Confidential Information. Upon termination of this Agreement under Article 9.2 or Article 9.3 where COMPANY is the Insolvent Party, or Article 9.4, COMPANY shall dispose of all tangible embodiments of the SELEXIS Technology and SELEXIS Confidential Information, including without limitation the SELEXIS Materials and Cell Lines, and render inaccessible or useless all electronic embodiments, of SELEXIS Confidential Information provided to COMPANY by SELEXIS hereunder, except that COMPANY may retain one copy of the SELEXIS Confidential Information delivered hereunder in its secured legal files only for ensuring compliance with the terms of this Agreement.

9.5.3. COMPANY Confidential Information. Upon any expiration or termination of this Agreement, SELEXIS shall dispose of all tangible embodiments, and render inaccessible or useless all electronic embodiments, of COMPANY Confidential Information provided to SELEXIS by COMPANY hereunder, except that SELEXIS may retain one copy of the COMPANY Confidential Information delivered hereunder in its secured legal files only for ensuring compliance with the terms of this Agreement.

9.5.4. Accrued Obligations. Expiration or termination of this Agreement shall not relieve the PARTIES of any obligation or liability accruing prior to such expiration or termination.

10. Miscellaneous

10.1. Assignment. Neither this Agreement nor any interest hereunder shall be assignable by either PARTY without the prior written consent of the other PARTY; provided, that either PARTY may assign this Agreement and all of its rights and obligations hereunder, without such prior written consent, to an entity which acquires all or substantially all of the business or assets of such PARTY (or the business or assets to which this Agreement pertains) whether by merger, consolidation, reorganization, acquisition, sale or otherwise; and COMPANY may assign this Agreement and all of its rights and obligations hereunder, without such consent, to an Affiliate if COMPANY remains liable and responsible for the performance and observance of all of the Affiliate's duties and obligations hereunder, and provided that such Affiliate is not a Contract Manufacturing Organization. This Agreement shall be binding upon the successors and permitted assigns of the PARTIES and the name of a PARTY appearing herein shall be deemed to include the names of such PARTY'S successors and permitted assigns to the extent necessary to carry out the intent of this Agreement. Any assignment not in accordance with this Article 10.1 shall be null and void.

10.2. Compliance with Governmental Obligations. Each PARTY shall comply, upon reasonable notice from the other PARTY, with all governmental requests directed to either PARTY relating to this Agreement and provide all information and assistance necessary to comply with the governmental requests.

10.3. Counterparts. This Agreement may be executed in any number of counterparts, each of which need not contain the signature of more than one PARTY but all such counterparts taken together shall constitute one and the same agreement, and may be executed through the use of facsimiles.

10.4. Dispute Resolution. The PARTIES agree that in the event of a dispute between them arising from, concerning or in any way relating to this Agreement, the PARTIES shall undertake good faith efforts to resolve any such dispute, with the matter being referred at the request of either PARTY to the General Counsel (or chief legal officer) of each PARTY and, if remaining unresolved after 30 days, then to the Chief Executive Officers of each PARTY (or their designees). If after 90 days of the matter first being referred to the General Counsel the PARTIES are unable to resolve such dispute, either PARTY may seek any remedy available pursuant to Article 10.16.

10.5. Entire Agreement. This Agreement sets forth all of the covenants, promises, agreements, representations, warranties, conditions and understandings between the PARTIES with respect to the subject matter hereof, and constitutes and contains the complete, final, and exclusive understanding and agreement of the PARTIES with respect to the subject matter hereof, and cancels, supersedes and terminates all prior agreements and understanding between the PARTIES with respect to the subject matter hereof. There are no covenants, promises, agreements, representations, warranties, conditions or understandings, whether oral or written, between the PARTIES other than as set forth herein. No subsequent alteration, amendment, change or addition to this Agreement shall be binding upon the PARTIES hereto unless reduced to writing and signed by the respective authorized officers of the PARTIES. For the avoidance of doubt, to the extent of any inconsistency between this Agreement and the Services Agreement. the terms of this Agreement shall govern and prevail.

10.6. Force Majeure. Neither PARTY shall be liable to the other for loss, damages, default or delay due to Force Majeure, provided that the PARTY affected by a case of Force Majeure gives prompt notice of such case to the other PARTY. The PARTY giving such notice shall thereupon be excused from its obligations hereunder as it is thereby disabled from performing for so long as it is so disabled, provided, however, that such affected PARTY commences and continues to take reasonable and diligent actions to cure such cause: and provided further that if any Force Majeure delays or prevents the performance of the obligations of either PARTY for a continuous period in excess of 30 days, the PARTY not affected shall then be entitled to terminate this Agreement, which termination shall be effective upon 10 days written notice to the affected PARTY. Such a termination shall be irrevocable, except otherwise provided by the PARTIES and upon termination the provisions of Article 9.5 shall apply.

10.7. Further Actions. Each PARTY agrees to execute, acknowledge and deliver such further instruments, and to do all such other acts, as may be necessary or appropriate in order to carry out the purposes and intent of the Agreement.

10.8. Independent Contractors. The relationship between SELEXIS and COMPANY created by this Agreement is one of independent contractors and neither PARTY shall have the power or authority to bind or obligate the other PARTY except as expressly set forth in this Agreement.

10.9. Interpretation of Agreement. Articles and other descriptive headings used in this Agreement are for reference purposes only and shall not constitute a part hereof or affect the meaning or interpretation of this Agreement. Whenever the context so requires, the use of the singular shall be deemed to include the plural and vice versa.

10.10. License Obligations. Nothing in this Agreement imposes any obligation upon a PARTY to enter into any other license or agreement with the other PARTY.

10.11. Notices. All notices and other communications required by this Agreement shall be in writing in the English language and shall be deemed given if delivered personally or by facsimile transmission (receipt verified), mailed by registered or certified mail (return receipt requested), postage prepaid, or sent by express courier service, to the PARTIES at the following addresses (or at such other addresses that a PARTY specifies by like notice, provided, however, that notices of a change of address shall be effective only upon written receipt thereof):

If to COMPANY, addressed to:

ROAR Therapeutics
[***]
San Diego, CA 92130

Attention: Charles Prussak, Ph.D.

Facsimile: [number]

If to SELEXIS, addressed to:

Selexis S.A.
18 Chemin des Aulx
1228 Plan-les-Ouates
Geneva, Switzerland

Attention: Ms Sophie Vock (General Assistant)

With a copy to: CEO, Igor Fisch, Ph.D.

Facsimile: +41 22 308-9361

10.12. Binding Effect. This Agreement shall be binding upon and inure solely to the benefit of COMPANY and SELEXIS (and their permitted successors and assigns) and nothing in this Agreement (express or implied) is intended to or shall confer upon any Third Party any rights, benefits or remedies of any nature whatsoever under or by reason of this Agreement.

10.13. Severability. If any term, covenant or condition of this Agreement or the application thereof to any PARTY or circumstance shall, to any extent, be held to be invalid or unenforceable, then the remainder of this Agreement, or the application of such term, covenant or condition to PARTIES or circumstances other than those as to which it is held invalid or unenforceable, shall not be affected thereby and each term, covenant or condition of this Agreement shall be valid and be enforced to the fullest extent permitted by applicable law.

10.14. Waiver. The failure on the part of a PARTY to exercise or enforce any rights conferred upon it hereunder shall not be deemed to be a waiver of any such rights nor operate to bar the exercise or enforcement thereof at any time or times hereafter.

10.15. Survival. Articles 1, 3.4, 4, 5, 6, 7, 8, 9.5 and 10 shall survive any termination or expiration of this Agreement in accordance with their terms.

10.16. Governing Law and Jurisdiction. This Agreement shall be governed by and construed in accordance with the substantive laws of Switzerland, without regard to principles of conflict of laws. Any dispute arising out of or in connection with this Agreement shall be subject to the exclusive jurisdiction of the courts of Geneva, Switzerland.

IN WITNESS WHEREOF, the PARTIES, having read the terms of this Agreement and intending to be legally bound hereby, do hereby execute this agreement:

SELEXIS SA		ROAR Therapeutics	
Signature:	/s/ Igor Fisch	Signature:	/s/Charles Prussak
Place, Date:	6/6/14	Place, Date:	5/28/14
Name:	Igor Fisch	Name:	Charles Prussak, Ph.D.
Title:	Chief Executive Officer	Title:	

EXHIBIT 1

SELEXIS PATENT RIGHTS

[***]

EXHIBIT 2

LICENSED PRODUCT(S):

ROR-1 MAb aka UC-961

Exhibit 10.47

***CERTAIN MATERIAL (INDICATED BY THREE ASTERISKS IN BRACKETS) HAS BEEN OMITTED FROM THIS DOCUMENT BECAUSE IT IS BOTH (1) NOT MATERIAL AND (2) WOULD BE COMPETITIVELY HARMFUL IF PUBLICLY DISCLOSED.

EXCLUSIVE LICENSE AGREEMENT

BETWEEN

GEORGETOWN UNIVERSITY

AND

TOKALAS, INC.

CONFIDENTIAL

GU Ref. No.
2006-041
2012-019
2014-012

LICENSE AGREEMENT

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Schedules

EXCLUSIVE LICENSE AGREEMENT

This Exclusive License Agreement ("Agreement"), effective as of March 28, 2014 ("Effective Date"), is by and between **Georgetown University**, a nonprofit institution of higher education organized as a non-stock corporation under federal charter", having its principal office at 37th & O Streets, NW, Washington, DC 20057 ("**Georgetown**") and **Tokalas**, **Inc**., a for-profit company having its principal office at 1737 Grand Avenue, Del Mar, CA 92014 ("**Company**").

ARTICLE 1. PREAMBLE

1.1 A valuable invention generally known as Targeting of EWS-FLI1 as Anti-Tumor Therapy ("Invention"), has been made by Georgetown faculty Jeffrey Toretsky, Milton Brown, Yali Kong and Aykut Uren ("Inventors").

1.2 Subject to certain rights retained by the U.S. Government in inventions resulting from federally supported work, under Georgetown's policy, Georgetown is owner by assignment of certain Patent Rights (as later defined herein) and has the right to grant licenses to the extent of its interest in such Patent Rights.

1.3 Georgetown is committed to the policy that ideas or creative works produced at Georgetown should be used for the greatest possible public benefit and believes that reasonable incentives should be provided for the prompt introduction of such ideas into public use, all in a manner consistent with the public interest.

1.4 Georgetown desires to have the Patent Rights developed and commercialized to benefit the public and is willing to grant a license hereunder.

1.5 Georgetown adheres whenever possible to socially responsible licensing practices, which address unmet and underserved needs, such as those of neglected patient populations or specific geographic areas, giving particular attention to improved therapeutics, diagnostics and agricultural technologies for the developing world.

1.6 Company has represented to Georgetown to induce Georgetown to enter into this Agreement, that Company shall commit itself to a thorough, vigorous, and diligent program of exploiting the Patent Rights so that public utilization shall result therefrom.

1.7 Company desires to obtain and Georgetown desires to grant Company an exclusive license under the Patent Rights upon the terms and conditions hereinafter set forth.

ARTICLE 2. DEFINITIONS

As used in this Agreement, the following terms shall have the following meanings; defined terms may be used in the singular or in plural, as sense requires:

2.1 "**Affiliate**": Any corporation or other business entity that controls Company, is controlled by Company, or is under common control with Company. "Controls," "control" or "controlled" as used in this paragraph means direct or indirect ownership of at least fifty percent (50%) or more of the outstanding voting stock or other voting ownership interests

of such corporation or other business entity, or the ability to direct (either directly or indirectly, through ownership of voting securities, by contract or otherwise) the decision-making authority of such corporation or other business entity.

2.2 "**Business Day**": A day other than a Saturday, Sunday, federal holiday, holiday observed by Georgetown, or any day on which the Georgetown campus is closed.

2.3 "**Back Patent Expenses**" shall have the meaning set forth in Section 7.9.1.

2.4 "**Claim Expiration Date**": the expiration of the last to expire of the claims of the Patent Rights covering the manufacture, use or sale of a Licensed Product in that country.

2.5 "**Clinical Trial**": A human clinical trial of a Licensed Product that satisfies the requirement of 21 C.F.R § 312.21, or its foreign equivalent. A Clinical Trial shall be considered commenced at the time the Licensed Product is administered to the first subject.

2.6 "**Combination Product**": Any product containing both a component that constitutes a Licensed Product and one or more other components that do not constitute Licensed Product and that is/are reasonably necessary for the function of such product and are sold together as a single product.

2.7 "**Commercially Reasonable Efforts**": With respect to the commercialization of a product, efforts that are consistent with those utilized by companies of size and type similar to Company (or, if applicable, a Sublicensee), assuming such comparable company(ies) is a going concern, for products with similar commercial potential at a similar stage of development, taking into consideration their safety and efficacy, their cost to develop, the competitiveness of alternative products, the nature and extent of their market exclusivity, the likelihood of regulatory approval, their profitability, and all other relevant factors.

2.8 "**Company**": Company shall be construed to mean "Tokalas".

2.9 "**Confidential Information**": Information (including without limitation documents, notes, drawings, models, designs, data, results, memoranda, tapes, records, software, formulae and algorithms, marketing data, business planning or financial information, in hard copy form or in electronic form) which is not generally available to the public and which is disclosed by a Party to the other Party in connection with this Agreement, including without limitation information that: (a) is related to and results from or arises out of use of the Invention, or the Patent Rights, or (b) is reasonably necessary for the practice of the Patent Rights or for the development or commercialization of Licensed Products, or (c) is related to and results from or arises out of this Agreement, the terms and conditions of this Agreement, and any reports associated with this Agreement, including Progress Reports and Royalty Reports.

2.10 "**Cover**", "**Covering**", **or** "**Covered**": "Cover", "Covering" or "Covered" means, with respect to Patent Rights, that, but for a license granted to a party under a claim included in such Patent Rights, the practice by such party of an Invention claimed in such Patent Rights would infringe such claim (or in the case of a patent application, would infringe a claim in such patent application if it were to issue as a patent).

2.11 "**Development Plan**": means a written description of the current plan prepared and undertaken or to be undertaken by Company (as it may be updated from time to time in accordance with Section 5.1) to commercialize the Licensed Products, which is attached hereto as Schedule B .

2.12 "**Developing Territory**": Countries within the Licensed Territory that are designated by The World Bank (www.worldbank.org) as Low-Income or Middle-Income Economies, attached hereto as Schedule E, as such list may change from time to time, or any subsequent list that may be mutually agreed to by Georgetown and Company.

2.13 "**Diagnostic Field**": means, and is limited to, the practice of the Patent Rights for diagnostics, including without limitation, companion diagnostics.

2.14 "**Effective Date**": The date of the last signature on the signature page.

2.15 "**FDA**": The U.S. Food and Drug Administration, or any successor agency thereto.

2.16 "**First Commercial Sale**": The initial Sale of a Licensed Product to a Third Party end user, following receipt of all applicable regulatory approvals.

2.17 "**Infringe**", "**Infringement**" or any correlative term: Any infringement (whether direct, indirect, contributory or otherwise) of any claim (including without limitation under the doctrines of claim construction or differentiation, literal overlap or equivalents); or any misuse, misappropriation, or theft related to the Patent Rights.

2.18 "**Initial Public Offering**" means the effectiveness of a registration statement for first sale of Company's common stock in a firm commitment underwritten public offering registered under the Securities Act of 1933, as amended.

2.19 "**Invention**": As defined in Section 1.1

2.20 "**Licensed Fields**": Collectively, the Therapeutic Field, the Diagnostic Field, and the Research Tool Field.

2.21 "**Licensed Product**": means (a) Any and all products or processes in the Licensed Fields, the making, use, offer for sale, sale, importation, or rendering of which, but for the license granted in this Agreement, would Infringe one or more claims of the Patent Rights in the country in which it is made, used, sold, offered for sale, imported, or rendered; or (b) any and all products in the Licensed Fields, the make, use, sale, or manufacture of which relies on a process(es) which, but for the license granted in this Agreement would Infringe one or more claims of the Patent Rights in the country in which it is made, used, sold, offered for sale, imported, or rendered. For the purposes hereof, a claim set forth in an application within the Patent Rights that has not been abandoned or finally rejected in a decision that is unappealable or unappealed within the time allowed for appeal shall be deemed a claim for the purposes of determining a Licensed Product. The invalidity of a particular claim in one or more countries shall not invalidate such claim in the remaining countries of the Licensed Territory.

2.22 "**Licensed Territory**": Worldwide.

2.23 "**Net Revenues**": The gross revenues received from combined Sales of Licensed Products, less the following: (a) commercially reasonable trade, quantity and cash discounts, chargebacks, credits and allowances actually allowed and taken; (b) sales or use taxes, excise taxes, customs duties, and other governmental charges; (c) amounts invoiced to the customer for outbound transportation, shipping, handling, and insurance; and (d) amounts actually allowed or credited on returns or rejections of Licensed Products or billing errors. In computing Net Revenues, no deductions from gross invoiced amounts and fees shall be made for commissions payable to individuals (whether they are with independent sales agencies or employed by Company) or for cost of collections. "Net Revenues" shall also include any recovery of compensatory or actual damages awarded to Company in an Infringement action, as set forth in Section 11.4.1. "Net Revenues" shall not include any consideration paid to cover the costs and expenses of research, including without limitation under a sponsored research agreement. Notwithstanding the above, the parties agree that the meaning of "Net Revenues" shall be modified in good faith as necessary to be consistent with the meaning of "Net Revenues" set forth in a contract between Company and a Sublicensee. Such a modification to the definition of Net Revenues will require Georgetown consent, which shall not be withheld unreasonably.

2.24 "**Non-Commercial Use**": Use of Patent Rights for academic research and development, education, or other not-for-profit scholarly purposes which are undertaken at Georgetown or at a nonprofit or governmental institution that does not use the Patent Rights in the production or manufacture of products for sale. For the sake of added clarity, research sponsored by a non-profit organization or commercial entity at Georgetown, performed by Georgetown personnel, Clinical Trials and/or translational research studies performed by Georgetown personnel shall be considered Non-Commercial Use.

2.25 "**Party**": Georgetown or Company; "Parties" means collectively Georgetown and Company.

2.26 "**Patent Expenses**": All fees, charges, expenses, and costs incurred before and after the Effective Date in connection with the preparation, filing, prosecution, issuance, reissuance, reexamination, interference, enforcement, and/or maintenance of patents or patent applications relating to the Patent Rights, including without limitation all fees and charges of outside patent counsel. Patent Expenses shall be considered to be incurred when the fee, charge, expense, or cost is actually incurred (rather than when it is invoiced). For example, charges of outside patent counsel are considered to be incurred as of the date on which the professional services are rendered.

2.27 "**Patent Rights**": a) U.S. and foreign patents and patent applications listed in **Schedule A**, as it may be amended from time to time by mutual agreement of the Parties; (b) all patents and patent applications related to clause (a), whether filed before or after the Effective Date, which claim priority under 35 U.S.C. § 119 or the benefit of the filing date under 35 U.S.C. § 120 or § 371 (but only to the extent of subject matter in a patent or patent application for which priority or benefit is claimed); (c) any substitution, divisional, continuation, and continuation-in-part (but only to the extent a claim in the

continuation-in-part is directed to subject matter contained in a patent or patent application described in clause (a) or (b)); (d) any patent issuing from any patent or patent application described in clause (a), (b), or (c); (e) any reissue, renewal, reexamination, or extension of any patent or patent application described in clause (a), (b), (c), or (d); and (f) any foreign counterpart or equivalent of any patent or patent application described in clause (a), (b), (c), (d), or (e).

2.28 "**Patent Validity Challenge**": Any action which challenges the validity or enforceability of, or otherwise opposes, any of the claims of the Patent Rights (including without limitation filing an action under the Declaratory Judgment Act, 28 U.S.C. § 2201(a)).

2.29 "**Person**": means an individual, sole proprietorship, partnership, limited partnership, limited liability partnership, corporation, limited liability company, business trust, joint stock company, trust, incorporated association, joint venture or similar entity or organization, including a government or political subdivision, department or agency of a government.

2.30 "**Phase 1 Clinical Trial**": A Clinical Trial, regardless of the terminology used to identify it, that is intended to initially evaluate the safety and/or pharmacological effect of an investigational new drug in subjects, or that would otherwise satisfy the requirements of 21 C.F.R. § 312.21(a), or its foreign equivalent, and is accepted as such by regulatory agencies.

2.31 "**Phase 2 Clinical Trial**": A Clinical Trial, regardless of the terminology used to identify it, for which a primary endpoint is a preliminary determination of efficacy of an investigational new drug for a particular indication in patients with the disease and to determine the common short-term side effects and risks associated with the drug, or that would otherwise satisfy the requirements of 21 C.F.R. § 312.21(b), or its foreign equivalent, and is accepted as such by regulatory agencies.

2.32 "**Phase 3 Clinical Trial**": A Clinical Trial, regardless of the terminology used to identify it, that is performed after preliminary evidence suggesting effectiveness of the drug has been obtained and that is intended to gather confirmatory data supporting effectiveness and safety needed to evaluate the overall benefit-risk relationship of the drug, to provide an adequate basis for physician labeling, or that would otherwise satisfy the requirements of 21 C.F.R. § 312.21(c), or its foreign equivalent, and is accepted as such by regulatory agencies.

2.33 "**Research Tool**": Any product that is used for research purposes only and is not to be used in clinical trials for any treatment or diagnostic purposes involving human subjects or animals.

2.34 "**Research Tool Field**": The use of Patent Rights for the development and commercialization of Research Tools in the Licensed Fields.

2.35 "**Sale**," "**Sell**," "**Resell**," or any correlative term: The sale, transfer, or other disposition of a Licensed Product in return for any type of consideration. Licensed Products shall be considered sold when shipped.

2.36 "**Sublicense**": Present, future, or contingent transfer of any license, right, option, first right to negotiate or other right granted under the Patent Rights licensed under this Agreement. Sublicense includes, without limitation, strategic partnerships, marketing collaborations, and distribution agreements.

2.37 "**Sublicensee**": A Person (other than an Affiliate of a Company) which receives a Sublicense under Article 4.

2.38 "**Sublicense Income**": As defined in Section 6.7.

2.39 "**Term**": As defined in Section 12.1.

2.40 "**Therapeutic Field**": means, and is limited to, the practice of the Patent Rights for any and all human therapeutic indications.

2.41 "**Third Party**": Any Person other than Georgetown, or Company.

ARTICLE 3. GRANT OF LICENSE

3.1 Subject to the provisions of this Agreement, Georgetown hereby grants to Company, and Company hereby accepts:

3.1.1 An exclusive, royalty bearing, transferrable license, with the right to Sublicense under the Patent Rights to make, have made, use, Sell, offer to Sell, import, and export Licensed Products and otherwise practice those Patent Rights in any manner in the Licensed Territory within the Therapeutic Field and the Diagnostic Field during the Term; and

3.1.2 A non-exclusive, royalty bearing, sublicensable, license under the Patent Rights, to make, have made, use, Sell, offer to Sell, and import Licensed Products and otherwise practice those Patent Rights in any manner in the Licensed Territory, within the Research Tool Field during the Term.

3.2 The granting and exercise of the license set forth in this Agreement is subject to the following conditions:

3.2.1 The granting and exercise of the license set forth in this Agreement is subject to the terms and requirements of Georgetown's "Georgetown University Intellectual Property Policy", Public Law 96-517, Public Law 98-620, and Georgetown's obligations under agreements with sponsors of research. Any right granted in this Agreement greater than that permitted under Public Law 96-517 or Public Law 98-620 shall be subject to modification as may be required to conform to the provisions of those statutes. The terms "Public Law 96-517" and "Public Law 98-620" include all amendments to those statutes.

3.2.2 Georgetown reserves for itself and for other non-profit research institutions and universities, the right for Non-Commercial Use to make, and use the subject matter described and claimed in Patent Rights, and to grant to others non-exclusive

licenses to make and use, for Non-Commercial Use the subject matter described and claimed in Patent Rights.

3.2.3 The Parties acknowledge that Georgetown has granted non-exclusive licenses for the Research Tool Field to Third Parties before the Effective Date.

3.3 No additional rights: Nothing in this Agreement shall be construed to confer upon Company any rights by implication, estoppel, or otherwise, to any technology or patent rights of Georgetown or any other entity other than the Patent Rights, regardless of whether such technology or patent rights shall be dominant or subordinate to any Patent Rights.

3.4 Validity Challenges to the Patent Rights.

In no less than ten (10) Business Days, prior to taking or causing any Patent Validity Challenge, Company, Affiliate or Sublicensee shall notify in writing of such intent to Georgetown and may at its sole discretion first file a Request for Reexamination of the Patent Rights in the USPTO, and await a final determination of said Request for Reexamination by the tribunal of last resort having jurisdiction. In the event that (i) Company or any of its Affiliates brings a Patent Validity Challenge, or (ii) Company or any of its Affiliates assists another party in bringing a Patent Validity Challenge (except as required under a court order or subpoena), and (iii) Georgetown does not choose to exercise its rights to terminate this Agreement pursuant to Section 12.2.5, then the running royalties due hereunder with respect to Patent Rights being challenged shall be doubled ("Excess Royalty Payment") for the remainder of the term of the Agreement.

ARTICLE 4. SUBLICENSES

4.1 Company may grant Sublicenses, which may be further sublicensed one time by the Sublicensee, to some or all of its rights under this Agreement, provided that there is no uncured material default or breach of this Agreement by the Company at the time of the grant, and the grant complies with the terms and conditions of this Article. Company shall be and remain responsible for the performance by each Sublicensee of the Company's obligations under this Agreement. Any purported Sublicense entered into by Company in violation of the requirements of this Article 4 or another provision of this Agreement shall constitute a material breach of this Agreement, and shall be null and void and without effect.

4.2 Company shall provide Georgetown written notice as to the identity of any proposed Sublicensee and to Company's knowledge whether the Sublicensee is involved in a legal proceeding against Georgetown. If the proposed Sublicensee is involved in a legal proceeding against Georgetown, Company shall not enter into any Sublicense without the prior written approval of Georgetown. Georgetown shall respond to Company's notice regarding identity and legal proceeding against proposed Sublicensee within fifteen (15) business days. Company shall promptly provide to Georgetown a true and complete copy of each executed Sublicense and amendments thereto within thirty (30) days of the date of execution of such Sublicense and amendment. Any documents provided under this Section shall be subject to Article 8 (Confidentiality).

4.3 Georgetown and Company mutually agree on the importance of ensuring that Licensed Products are made available to people in all economic strata around the world. On a country-by country and case-by-case basis in countries in which there is at least one valid claim and where the Company has already made its First Commercial Sale of a Licensed Product in a Licensed Territory, Company shall take commercially reasonable measures to Sell and/or offer for Sale Licensed Product to public sector entities in Developing Territories, provided that in each case, such public sector entity has put into place adequate measures to ensure that the Licensed Product will only be used in the country in the Developing Territory which such public sector entity is located and will not be used to diagnose, test, analyze, review, or produce data, or be distributed outside to, directly or indirectly, any person or entity outside of the such country in the Developing Territory. Company or Sublicensee agrees that if it directly sells or distributes such Licensed Products into the Developing Territory then such Licensed Products will be sold at a price the profit margin for which shall be in accordance with the generally accepted accounting principles, commonly abbreviated as GAAP. Company or Sublicensee shall not be required to distribute to any Developing Territory if such distribution would violate any law, rule, regulation, treaty or order or to the extent that such Developing Territory materially restricts or prohibits the termination of any Sublicensee or distributor in such Developing Territory.

4.4 Company shall be responsible to ascertain, compute, audit, and collect all consideration that is payable by the Sublicensee and to enforce the performance by the Sublicensee of its obligations under the Sublicense. Each Sublicense granted by Company pursuant to this Agreement shall include an audit right by Georgetown of Sublicensee of the same scope as provided in Article 10.

4.5 Any Sublicense granted by Company shall provide for the termination of the Sublicense, or the conversion to a license directly between the Sublicensee and Georgetown, at the option of the Sublicensee, upon the termination of this Agreement under Article 12. This conversion is subject to Georgetown approval and contingent upon acceptance by the Sublicensee of the remaining provisions of this Agreement.

4.6 Company agrees to contractually obligate each Sublicensee to comply with all applicable terms of this Agreement and to include a requirement that the Sublicensee use its commercially reasonable efforts to bring the subject matter of the Sublicense into commercial use as quickly as is reasonably possible.

4.7 Each Sublicense granted by Company shall: (i) not contain any provision which would result in any loss, damage to, or diminution in the value or integrity of the Patent Rights or other rights licensed under this Agreement; and (ii) prohibit further sublicensing by Sublicensee without the prior written consent of Georgetown (which consent shall not be unreasonably withheld).

ARTICLE 5. DILIGENCE REQUIREMENTS

5.1 A true and complete copy of the initial Development Plan is attached hereto as Schedule B. The Company shall provide Georgetown a more detailed version of the Development Plan within six (6) months of Effective Date of this Agreement. From time to time, as research and development results from work under the Development Plan and/or the business environment dictates, the Company may modify the Development Plan. If and when the Company makes a change to the Development Plan that would materially affect the Milestones set forth in Schedule C, it will so notify Georgetown no less than thirty (30) days before any Milestone due date would be missed, and the Parties will amend this Agreement to the extent reasonably necessary to conform to any approved modifications of the Development Plan, including without limitation the Milestones set forth on Schedule C and the Milestone payments set forth on Schedule D. Such amendments shall be negotiated reasonably and in good faith by the Parties.

5.2 Upon request by Georgetown during the first two years following the Effective Date, Company's representatives shall meet with representatives of Georgetown's Office of Technology Commercialization either in person or via telephone calls or videoconferencing no less often than quarterly to advise on progress of the Development Plan.

5.3 Company shall use Commercially Reasonable Efforts to bring one or more Licensed Products into the commercial market as soon as practicable in accordance with the Development Plan, as it may be duly amended pursuant to Section 5.4, but in any case, the first Licensed Product for Therapeutic Field shall be commercially available by March 1, 2026 in accordance with the milestone set forth on Schedule C. For purpose of the foregoing sentence, the efforts of a Sublicensee (or of Sublicensee's Affiliates) shall be considered the efforts of Company. After the First Commercial Sale, Company shall use commercially reasonable efforts to keep Licensed Products available to the public.

5.4 Subject to the cure period in Article 12.2.2, and Georgetown's willingness to amend this Agreement, Company's or Sublicensee's failure to perform in accordance with Section 5.3 or to fulfill on a timely basis any one of the Milestones set forth on Schedule C hereof shall be grounds for Georgetown to terminate this Agreement and upon termination all rights and interest to Patent Rights shall revert to Georgetown.

ARTICLE 6. FINANCIAL PROVISIONS

The Parties acknowledge and agree that payment obligations set forth in this Article 6 were established for the convenience of the Parties after due consideration was given to alternative payment structures. These payment obligations have been agreed by the Parties to be the most appropriate and convenient means of valuing Company's right to practice the Patent Rights under this Agreement and to receive the benefit of Georgetown entering into this Agreement. In consideration of the license and rights granted hereunder:

6.1 License Maintenance Fee. Company shall pay non-refundable license maintenance fees to Georgetown of $10,000 annually beginning on the anniversary of the Effective Date following the year in which the Back Patent Expenses are paid in full and $10,000 on every subsequent anniversary of the Effective Date during the Term, through and including the calendar year in which the First Commercial Sale occurs. The license maintenance fees are not creditable against any other fee, royalty, or payment. Notwithstanding the foregoing, in the event that a Sublicense is granted before the Back Patent Expenses are paid in full, Company shall pay any remainder of the Back Patent Expenses within thirty (30) days of the Sublicense and begin payments of said non-refundable annual License Maintenance Fees to Georgetown from the year such Sublicense occurs on the anniversary of the Effective Date of this Agreement.

6.2 Milestone Payments. Company shall pay to Georgetown the milestone payments as set forth on Schedule D within thirty (30) days from the date such Milestone was achieved (or within thirty (30) days of receipt of notice from a Sublicensee of achieving the Milestone). The milestone payments are not creditable against any other fee, royalty, or payment, except as provided for in Section 6.7.3. In the event that Company or Sublicensee Development Plan changes such that Company or a Sublicensee decides intentionally not to perform any milestone set forth on Schedule C, Company shall remain responsible for the Milestone Payment associated with such milestone as set forth on Schedule D and shall pay Georgetown the milestone payment at the time such milestone should have been achieved. Notwithstanding the above, if an investigational new drug fails for a therapeutic indication at any phase of development including any phase of Clinical Trial, Company shall not be responsible for any additional Milestone Payment with respect to such therapeutic indication. In addition, if no patent is finally granted in any jurisdiction in the Patent Rights such that the decision for such non-allowance of Patent Rights is unappealable or unappealed with the time allowed for appeal, Company shall not be responsible for any outstanding Milestone Payments under Schedule D.

6.3 Minimum Annual Royalty. Company shall pay Georgetown guaranteed minimum annual royalties of $15,000 per year, beginning with the calendar year following the First Commercial Sale. Company shall pay the minimum annual royalty due with respect to a calendar year by the next February 1 following that year. Minimum annual royalties for any year shall be creditable against Earned Royalty payable under Section 6.4 for that year.

6.4 Earned Royalties.

6.4.1 Sales of Licensed Products. Company shall pay to Georgetown the following royalties on Net Revenues (the “Earned Royalty) as follows:

a. With respect to combined Sales of all Therapeutic, Diagnostic or Research Tool Licensed Product, the higher of either: [***] of Net Revenues received by Company for its Sales of Licensed Products or [***] of royalties received by Company from Sublicensee annually, if Sublicensee Sells Licensed Products.

b. For the purpose of calculating royalties due hereunder, in the event that a Licensed Product is sold as a Combination Product during a particular calendar quarter, Net Revenues from Sales of such Combination Product shall be calculated by multiplying the net revenues of the Combination Product by the fraction 'A/(A+B)', where 'A' is the average per unit sales price for such calendar quarter of the Licensed Product sold separately in the country of sale, and 'B' is the average per unit sales price for such calendar quarter of the other product(s) sold separately in the country of sale. If no separate sales are made of the Licensed Product and/or the other product(s) in the country of sale, separate sale prices in commensurate countries may be used instead. In the event that no separate sales are made of the Licensed Product and/or the other product(s), for the purpose of determining royalty payments under this Agreement, Net Revenues from Sales of a Combination Product shall be calculated using a method agreed upon in good faith by the parties. In no event, shall the royalties payable to Georgetown on Licensed Product sold as Combination Product be less than royalties payable to Georgetown on Licensed Product sold as stand-alone.

6.5 Expiration of Royalties. Royalties under Section 6.4.1 shall be payable on a country-by-country and Licensed Product-by-Licensed Product basis commencing with the First Commercial Sale until the later of: (i) the expiration of the last to expire of the claims of the Patent Rights covering the manufacture, use or sale of a Licensed Product in that country (the "Claim Expiration Date"), or (ii) the date of expiration of any regulatory or marketing exclusivity of a Licensed Product.

6.5.1 Royalty if no patent: If a patent is not issued or all issued patents are finally determined by a court of competent jurisdiction to be invalid or unenforceable, and the Company and/or Sublicensee desire nevertheless to continue to commercialize the Licensed Products that incorporates or uses know-how covered in Invention and/or the Patent Rights, Company and/or Sublicensee shall pay to Georgetown a reduced royalty of [***] on annual Net Revenues for five (5) years after First Commercial Sale of Licensed Products or ten (10) years if such failure is due to interference unless the Parties agree otherwise. However, such royalty obligation shall terminate for every country once a competitor with a product that would have been protected by Patent Rights or incorporates or uses know-how covered in Invention and/or Patent Rights enters the market in the same therapeutic indication of such country.

6.6 Sales to Company Affiliates or Sublicensee. Company shall not be required to pay royalties on Sales of Licensed Products to a Company's Affiliate or Sublicensee, if those Sales are for purposes of resale. However, if the Company Affiliate or Sublicensee is an end user of a Licensed Product, such Sales from Company to the Company Affiliate or Sublicensee shall be included in Net Revenues of the Licensed Product for the purpose of calculating royalties, at the weighted average selling price charged by Company or Company Affiliates to Third Parties for the Licensed Product during that same period and in the relevant country.

6.7 Sublicense Income.

6.7.1 "Sublicense Income" means consideration in any form receivable from a Sublicensee for use of Patent Rights or otherwise in consideration of its rights as a Sublicensee, including without limitation up-front fees, license signing fees, license maintenance fees, milestone payments, success fees, and any other consideration paid by or on behalf of the Sublicensee. "Sublicense Income" shall not include any payment or consideration received by Company from a Sublicensee in consideration for anything other than a Sublicense, including without limitation: any royalties based on Sales of Licensed Product by any Sublicensee; amounts paid for equity of Company by a Sublicensee (up to fair market value); loans or extensions of credit by a Sublicensee to Company; consideration for a license granted under technology other than the Patent Rights; or consideration designated to defray, reimburse, or fund expenses of research and development rendered by or to be performed in connection with the development of a Licensed Product.

6.7.2 As to each Sublicense granted by Company, Company shall pay Georgetown a [***] of Sublicense Income.

6.7.3 The amount of any Milestone Payment paid to Georgetown by Company pursuant to Section 6.2 may be credited to any Sublicense Income due to Georgetown if it is for the same milestone event.

6.7.4 Miscellaneous

a. Any cash payment due to Georgetown under this Section 6.7 shall be paid within sixty (60) days of the end of each calendar quarter during which Sublicense Income is received.

b. Georgetown shall have the option, in its sole discretion, to have any non-cash Sublicense Income (including, without limitation, securities) either: (1) paid in kind by Company transferring and delivering to Georgetown the required percentage of Sublicense Income within sixty (60) days of Company receiving the Sublicense Income; or (2) paid by the Company, if Company agrees, in the cash equivalent of the fair market value of the Sublicense Income. Sublicense Income shall be valued at the greatest of the fair market value determined as of: (1) the effective date of the Sublicense; or (2) the date of transfer of the securities to the Company.

c. Notwithstanding Section 6.7.4 (b), if Company cannot transfer and deliver the Sublicense Income without violating an applicable law, regulation, or other legal requirement, or the terms of any agreement or other arrangement with a Third Party (including the Sublicensee), then Company shall transfer and deliver the share of the Sublicense Income to Georgetown as soon as the transfer is permitted. In that event, Sublicense Income shall be valued at the fair market value determined as of the date of payment by Company to Georgetown.

d. As to any other form of Sublicense Income that cannot be valued as contemplated by this Section 6.7.4, the Parties shall negotiate in good faith to arrive at a mutually agreeable solution under which Georgetown shall receive its required share.

ARTICLE 7. PATENT PROSECUTION

7.1 As of the Effective Date, Georgetown has filed patent applications as set forth in Schedule A (Patent Rights).

7.2 Within thirty (30) days following the Effective Date ("Transfer Date"), Georgetown shall transfer to Company, and Company shall take, the responsibility for preparing, filing, prosecuting (including, without limitation, defense of the applications in an interference proceeding, reexamination, or litigation), and maintaining the Patent Rights in Georgetown's name. Company will keep Georgetown fully informed, at Company's expense, of all developments with respect to Patent Rights and shall provide to Georgetown copies of all official patent office actions within a week of Company's receipt of same. With regard to the filing of any official patent-related documents, such as without limitation, office action responses, Company shall provide copies of such documents no fewer than three (3) weeks before the filing by Company of any such official papers. Company shall consider Georgetown's comments and advice on all actions. Company shall not seek to narrow the scope of or irrevocably abandon a pending application or an issued patent without obtaining Georgetown's consent. Company shall confer with Georgetown to develop a strategy for the filing, prosecution and maintenance of Patent Rights and shall consider all advice and guidance provided by Georgetown. If Georgetown disagrees with Company's strategy, Georgetown may request the opinion of an independent patent counsel, and Company will permit said counsel to confer with Company's patent counsel and shall take into consideration advice and comments of said counsel. Company and Georgetown shall equally split the legal cost of such independent opinion.

7.3 Prior to the Transfer Date: a) Georgetown shall provide the name and contact information of its designated patent prosecution representative to Company; and b) Company and Georgetown shall execute necessary documents for transfer of patent prosecution from Georgetown to Company.

7.4 Georgetown and Company have mutually identified patent counsel to be Ned Israelsen at Knobbe, Martens, Olson, and Bear, LLP. Company shall not subsequently change patent counsel without prior identification of a new patent counsel that is mutually agreeable to Georgetown and Company.

7.5 If Company determines not to file, prosecute, or maintain, or to abandon or donate to the public, any patent application or patent included in the Patent Rights in the Licensed Territory, or not to pursue any available patent extension with respect to any such patent, Company shall provide Georgetown forty-five (45) days written notice of such determination and provide Georgetown any necessary assistance to take over the applicable filing, prosecution, maintenance, or pursuit of extension with respect to the relevant patent application or patent in the name of Georgetown. Company will cooperate fully with

Georgetown to effect the transfer of responsibility for said patents or patent applications prosecution or maintenance to Georgetown's patent counsel. Company will remain responsible for patent expenses during the forty-five (45) day period. With respect to any such patents or patent applications, once the transfer is effected, Company will no longer have any rights to said patents or patent applications.

7.6 Company shall comply with the requirement to include within the specification of any new patent application and any patent issuing thereon within the scope of Patent Rights, a statement specifying that the invention was made with Government support and that the Government has certain rights in the invention.

7.7 Company shall be liable for any loss, as a whole or in part, of the Patent Rights, including, without limitation, if the loss results from acts or omissions of outside patent counsel. In such event, Georgetown shall be free to pursue and all legal remedies.

7.8 If Company fails to comply with the obligations under this Article, or is grossly negligent in its prosecution or maintenance of the protection of the Patent Rights in the United States and in foreign countries, Georgetown shall be free to take over the rights granted to the Company in this Article 7.2 and to file or continue prosecution or maintain any applications, and to maintain any protection issuing thereon in the United States and in any foreign country. Company shall be responsible for all the patent expenses incurred by Georgetown thereon for the Term of the Agreement.

7.9 Patent Expenses.

7.9.1 Patent Expenses Incurred Prior to the Effective Date. Company shall pay Georgetown all documented patent expenses incurred prior to the Effective date ("**Back Patent Expenses**") except those incurred with regard to the issuance of the European patent for the peptides and currently abandoned, under the following schedule: (i) Ten thousand dollars ($10,000) on the first anniversary of the Effective Date; and(ii) Ten thousand dollars ($10,000) on every anniversary of the Effective Date thereafter until Back Patent Expenses are reimbursed in full to Georgetown.

Notwithstanding the foregoing, if a Sublicense is executed before the Company has reimbursed Georgetown Back Patent Expenses, 100% of the unreimbursed Back Patent Expenses shall become payable to Georgetown by Company within thirty (30) days of the effective date of a Sublicense agreement.

7.9.2 Patent Expenses Incurred from the Effective Date Forward ("**Future Patent Expenses**"). For all Future Patent Expenses, Company shall instruct its patent counsel to send invoices directly to Company with copies to Georgetown and Company shall pay each undisputed invoice in full to the patent counsel. Georgetown is not responsible for any patent costs incurred by Company. Subject to Section 7.8, Georgetown may takeover Patent Expenses and prosecution of the Patent Rights. In such case, if undisputed outstanding expenses are not paid within sixty (60) days from notification by Georgetown that Company is out of compliance with Patent Expense payments, Georgetown may terminate this Agreement. For the

sake of clarity, it should be noted that this is an exception to the Failure to Pay Section 12.2.1.

7.9.3 The amount of **Back Patent Expenses** on the day before the Effective Date is $97,091.80.

ARTICLE 8. CONFIDENTIALITY

8.1 Confidential Information: All **Confidential Information** disclosed by one Party to the other Party hereunder including this Agreement, the terms and conditions of the Agreement, Progress Reports, and Royalty Reports, shall be maintained in confidence by the receiving Party and shall not be disclosed to any Third Party or used for any purpose without the prior written consent of the disclosing Party for a period of two (2) years from the termination or expiration of this Agreement or five (5) years from the date of disclosure of such **Confidential Information**, whichever is longer, except to the extent that such Confidential Information is:

8.1.1 now in the public domain or subsequently enters into the public domain through no fault of the receiving Party;

8.1.2 known by the receiving Party at the time of its receipt and not through a prior disclosure by the disclosing Party as documented by the receiving Party's written records;

8.1.3 developed by or for the receiving Party independently of Confidential Information received from the disclosing Party as documented by the receiving Party's written records;

8.1.4 subsequently disclosed to the receiving Party by a Third Party who may lawfully do so and is not under an obligation of confidentiality to the disclosing Party;

8.1.5 disclosed to governmental or other regulatory agencies in order to obtain patents or to gain or maintain approval to conduct clinical trials or to market Licensed Products, but such disclosure may be only to the extent reasonably necessary to obtain patents or authorizations; and/or deemed necessary by Company to be disclosed to Sublicensees, agents, consultants, and/or other third parties for the development and/or commercialization of Licensed Products and/or in connection with a licensing transaction and/or a permitted assignment under this Agreement, and/or loan, financing, or investment and/or acquisition, merger, consolidation, or similar transaction (or for such entities to determine their interest in performing such activities) in each case on the condition that any third parties to whom such disclosures are made agree to be bound by written confidentiality and non-use obligations contained in this Agreement.

8.2 If a Party is required by judicial or administrative process to disclose Confidential Information that is subject to the non-disclosure provisions of this Article 8 (Confidentiality), such Party shall promptly inform the other Party of the disclosure that is being sought in order to provide the other Party an opportunity to challenge or limit the

disclosure obligations. Confidential Information that is disclosed by judicial or administrative process shall remain otherwise subject to the confidentiality and non-use provisions hereof, and the disclosing Party, pursuant to law or court order, shall take all steps reasonably necessary, including without limitation obtaining an order of confidentiality, to ensure the continued confidential treatment of such Confidential Information.

8.3 Legal and Business Disclosures Either Party may disclose the terms of this Agreement to the extent required, in the reasonable opinion of such Party's legal counsel, to comply with applicable laws, including without limitation the rules and regulations promulgated by the SEC. Notwithstanding the foregoing, before disclosing this Agreement or any of the terms hereof pursuant to this Section 8.3, the Parties will consult with one another on the terms of this Agreement to be redacted in making any such disclosure. The Company may disclose the financial and business terms of this Agreement to current or potential investors or acquirers of all or substantially all assets covered by this Agreement so long as the information is marked "Confidential" or "Proprietary" upon disclosure. The Company agrees not to disclose Confidential Information related to Patent Rights unless recipient is under confidentiality such that the recipient may not disclose such Confidential Information. If a Party discloses this Agreement or any of the terms hereof in accordance with this Section 8.3, such Party agrees, at its own expense, to seek confidential treatment of portions of this Agreement or such terms as may be reasonably requested by the other Party. Each Party shall follow the notification requirements as stated in Section 8.2.

ARTICLE 9. REPORTING

9.1 Progress Report. Company shall provide true and accurate semi-annual written reports for the first three (3) years after the Effective Date, and annual written reports thereafter, to Georgetown on progress of Development Plan. The reports shall describe progress on research and development, regulatory approvals, manufacturing, Sublicensing, marketing, and Sales, if applicable, during the most recent six (6) or twelve (12)-month period ending June 30 and December 31 and plans for the forthcoming year ("Progress Report"). The reports shall be due within thirty (30) days following the expiration of each reporting period. Any information or reports provided under this Section shall be Company's Confidential Information subject to Article 8 (Confidentiality).

9.2 Company shall report to Georgetown the date of First Commercial Sale of Licensed Product in the United States of America, Japan, and Europe within thirty (30) days of occurrence (or within thirty (30) days of receipt of notice from a Sublicensee of First Commercial Sale).

9.3 Royalty Report.

9.3.1 No later than sixty (60) days after each calendar half year ending June 30 and no later than ninety (90) days after each calendar half year ending December 31, Company shall provide Georgetown with a written report, certified as correct by an officer of Company, setting forth for such half year at least the following information ("**Royalty Report**"):

a. the number of Licensed Products sold by Company, and Sublicensees;

b. invoiced amounts for such Licensed Products;

c. deductions applied to determine the Net Revenues thereof;

d. the amount of Sublicense Income received by Company;

e. a detailed listing of all deductions from royalties; and

f. the amount of royalty due thereon, or, if no royalties are due to Georgetown for such reporting period, the statement that no royalties are due.

9.3.2 Upon reasonable request by Georgetown, Company shall provide to Georgetown within thirty (30) days of such request, **Royalty Report** that will have aforesaid information on a country by country basis.

9.3.3 Company shall pay Georgetown with each such **Royalty Report** the amount of royalty due for such half year.

9.3.4 All payments due hereunder shall be deemed received when funds are wired and credited to Georgetown's bank account and when received by Georgetown. Conversion of foreign currency to U.S. dollars shall be made at the conversion rate existing in the United States on the last working day of each royalty period (as reported in The New York Times or The Wall Street Journal). No transfer, exchange, collection, or other charges shall be deducted from such payments.

9.3.5 All **Royalty Reports** shall be maintained in confidence by Georgetown except as required by law; however, Georgetown may include in its internal reports annual amounts of royalties paid.

9.3.6 Late payments shall be subject to a charge of one-and-one-half percent (1.5%) per month, or two-hundred-and-fifty dollars ($250) per month, whichever is greater.

9.3.7 In the event of a Liquidation Event or change of corporate name, Company shall notify Georgetown in writing within thirty (30) days of such event and the Parties shall duly amend this Agreement.

9.3.8 In the event Company cannot, after good faith negotiation with Sublicensee, enter into a Sublicense that provides for semi-annual royalty payment and royalty reporting requirement pursuant to Sections 9.3.1 and 9.3.2 (but in any event Company will not agree to a Sublicense that provides for royalty payments and reporting requirements on a less frequently than annual basis), Company shall notify Georgetown in writing and the Parties will amend the Agreement to require Royalty reports and make royalty payments annually from the date of such notification.

ARTICLE 10. RECORD KEEPING

10.1 Company shall maintain and shall require its Affiliates and Sublicensees to maintain accurate records (together with supporting documentation) of Licensed Products made, used, or sold under this Agreement, appropriate to determine the amount of royalties due to Georgetown hereunder ("**Accounting Records**").

10.2 Upon written notification of at least thirty (30) days but not more than once per twelve month period, **Accounting Records** shall be made available during normal business hours for examination by an auditor selected by Georgetown ("**Auditor**"), who has entered into a confidentiality agreement with Company or a Sublicensee, for the sole purpose of verifying reports and payments due hereunder. In conducting examinations pursuant to this Article 10 (Record Keeping), **Auditor** shall have access to all records that Georgetown reasonably believes relevant to the calculation of royalties due under Article 6 (Financial Provisions).

10.3 During the term of this Agreement and for five (5) years after its expiration or termination, Company and Sublicensee shall keep complete, true, and accurate records containing all the particulars that may be necessary to determine royalties payable to Georgetown under this Agreement. The records shall be subject to inspection during regular business hours upon reasonable advance written notice to Company by an independent auditor appointed by Georgetown for this purpose and reasonably acceptable to Company. **Auditor** shall report to Georgetown only the amount of royalties, fees, or other payable under this Agreement.

10.4 **Auditor** shall not disclose to Georgetown any information other than information relating to the accuracy of Accounting Records and payments made hereunder.

10.5 Such examination by **Auditor** shall be at Georgetown's expense, provided, however, that if such examination shows an underreporting or underpayment in excess of five percent (5%) for any twelve (12)-month period, then Company or the Sublicensee shall pay the cost of such examination as well as any additional sum that would have been payable to Georgetown had the Company or Sublicensee reported correctly, plus interest on said sum at the rate of one-and-one-half per cent (1.5%) per month. Georgetown will use reasonable efforts to conduct the audit and notify the Company of any underpayment within ninety days from the start of the audit. In the event Georgetown takes longer than 90 days to notify Company of any underpayment, any interest owed for the time period between ninety days and date of notification will be forfeited by Georgetown.

ARTICLE 11. PATENT INFRINGEMENT

11.1 Notification. Each Party shall promptly notify the other if it has knowledge of or reasonable grounds to suspect any Infringement, and shall promptly provide any available evidence of that Infringement to the other Party.

11.2 Right to Sue Infringers. So long as Company remains the exclusive licensee of the Patent Rights in the Licensed Field in the Licensed Territory and is not in default hereunder, to the extent permitted by law, Company shall have the first right, but not the obligation, to bring suit for any Infringement in its own name, at its own expense, and on its own behalf.

11.2.1 If a declaratory judgment action alleging invalidity or non-infringement of any of the Patent Rights is brought against Company or raised by way of counterclaim or affirmative defense in an Infringement suit brought by Company under Section 11.2.1, Georgetown shall have the first right, but not the obligation, to defend the suit in its own name, at its own expense, and on its own behalf.

11.3 Expenses. In any action under Section 11.2.1, Company shall be responsible for all expenses related thereto, including without limitation costs, fees, expert witness fees, attorney fees, and disbursements, including without limitation all expenses incurred by Georgetown.

11.4 Recoveries.

11.4.1 Any recovery by Company of compensatory or actual damages (including, without limitation, damages awarded to compensate for lost profits or lost sales due to Infringing sales, price erosion due to Infringing sales, diminution of value of Licensed Products, or lost sales of unpatented related products) shall be applied as follows: (i) each Party shall first be reimbursed for any expenses incurred in the action (including attorney's fees and the amount of any royalty or other payments withheld from Georgetown as described in Section 11.3) ("**Litigation Expenses**"); (ii) any remaining compensatory or actual damages following the deduction of **Litigation Expenses**, shall be awarded to the Company subject to payment of royalties thereon to GEORGETOWN pursuant to Sections 2.23 and 6.4.

11.4.2 Any recovery by Company of punitive, special, incidental, consequential, indirect, or other non-compensatory damages (including without limitation treble damages for willful infringement under §284 of the Patent Act, or attorney's fees under §285 thereof) shall be deemed to reflect non-earned royalty income, and shall be distributed as follows:

a. First, in shares to Company and Georgetown in an amount necessary: (1) to reimburse Company for Litigation Expenses which were not credited against royalties under Section 11.3; and (2) to reimburse Georgetown for **Litigation Expenses** which were credited against royalties under Section 11.3; and

b. Second, Company shall pay Georgetown fifteen percent (15%) of the net recovery after payment of expenses in 11.4.2. a.

11.4.3 In the event, the Parties agree to settle the Infringement suit, the settlement amount shall be distributed pursuant to Section 11.4.2.

11.5 Georgetown's Rights to Sue or Intervene.

11.5.1 If Company fails to bring suit under Section 11.2 by twenty (20) days prior to any required filing deadline (but not later than two (2) months after receiving notice or otherwise having knowledge of Infringement), Georgetown shall have the right, but not the obligation, to take any action it deems appropriate, including without limitation, initiating a suit or granting a license to the alleged infringer. If Company fails to timely notify Georgetown of its intent to respond in opposition to a legal action under Section 11.2 within ten (10) days after Company's receipt of notice of the filing of the action, or if Company notifies Georgetown that it does not intend to oppose the action, Georgetown shall have the right, but not the obligation, to respond to the action at its own expense. In addition, Georgetown shall have a continuing right to intervene in any action described in Section 11.2.1.

11.5.2 Declaratory Judgment Actions. In the event that a Patent Validity Challenge is brought against Georgetown or Company by a Third Party, the Company, at its option, shall have the right within twenty (20) days after commencement of such action to take over the sole defense of the action at its own expense. If Company does not exercise this right after ten (10) days from receipt of any filing or complaint, Georgetown may take over the sole defense of the action at Georgetown's sole expense. If Company assumes such defense, it shall diligently oppose such Patent Validity Challenge and cooperate with Georgetown in such defense.

11.5.3 Notwithstanding anything in this Agreement to the contrary, if Georgetown files suit, responds to a legal action, or otherwise intervenes pursuant to Section 11.5.1, Georgetown shall be responsible for its own expenses, including litigation expenses, and shall be entitled to all recoveries which it obtains for itself in connection therewith.

11.5.4 Notwithstanding anything in this Agreement to the contrary, if Georgetown files suit, responds to a legal action, or otherwise intervenes pursuant to Section 11.5.1, Georgetown shall be entitled to settle any action on terms to be established by Georgetown in its sole discretion. Georgetown may settle the action by, among other things, granting a license to the alleged infringer in the event that such license is deemed necessary in the opinion of Georgetown to settle and obtain a release from or covenant to not to sue or bring an action with respect to any claim related to the invalidity or interference of the Patent Rights. In that event, Georgetown shall be entitled to convert the license granted to Company hereunder from an exclusive license to either a non-exclusive or co-exclusive license.

11.6 Conduct of Suit.

11.6.1 Company shall diligently pursue any suit or action under Section 11.2 that was undertaken by Company. Company shall keep Georgetown reasonably apprised of all developments, and shall seek Georgetown's input and approval on any

substantive submissions or positions taken regarding the scope, validity, and enforceability of the Patent Rights.

11.6.2 Company shall not prosecute, defend, or otherwise compromise any suit in a manner that materially adversely affects Georgetown's interests. Company shall not enter into any settlement, consent judgment, agreement (including without limitation any grant of a Sublicense to the alleged infringer), or other voluntary final disposition of any suit without Georgetown's prior written consent, which consent shall not be unreasonably withheld.

11.6.3 Each Party shall provide prompt access to all necessary documents and shall render reasonable assistance in response to requests by the other Party related to any suit under this Article 11.

11.6.4 Any Party which commences a suit and then wants to abandon it shall give at least thirty (30) days notice to the other Party. The other Party may continue prosecution of the suit, in which event the Parties shall negotiate in good faith regarding the sharing of expenses and any recovery in the suit.

11.6.5 Neither Party shall be liable for any losses incurred as a result of an action for Infringement brought against the other Party as a result of the other Party's actions or omissions, including without limitation its exercise of any right granted under this Agreement.

11.6.6 No settlement, consent judgment or other voluntary final disposition of the suit may be entered into without the prior consent of Georgetown, which consent shall not be unreasonably withheld.

ARTICLE 12. TERM AND TERMINATION

12.1 Term and Expiration. This Agreement shall commence as of the Effective Date. Unless earlier terminated in accordance with this Article, this Agreement shall expire on a country-by-country basis until the later of: (a) Claim Expiration Date including Patent Extensions; or (b) the date of expiration of any regulatory or market exclusivity of a Licensed Product; or (c) in the absence of issued claims, five (5) years after the First Commercial Sale of a Licensed Product for each Licensed Field in that country or ten (10) years if absence of issued claims is due to an interference and the Licensed Product continues to be sold (the "Term").

12.2 Termination by Georgetown.

12.2.1 Failure to Pay. In the event of a failure by Company to pay Georgetown any material sum, (which is any amount over five thousand dollars ($5,000)) due and payable under this Agreement and such sum is not in dispute, Georgetown may terminate this Agreement and the license(s) granted under this Agreement, if the failure is not cured within thirty (30) days of receiving written notice thereof from Georgetown, except as provided in 7.9.2.

12.2.2 Other Failure to Perform. In the event of any undisputed material breach or default of this Agreement (other than those covered by another subsection of this Article 12.2) and subject to Article 5.4 with regard to the Development Plan, Georgetown may terminate this Agreement and the license(s) granted under this Agreement, if the failure is not cured within sixty (60) days of written notice thereof. However, if that failure cannot be cured by the exercise of due diligence within sixty (60) days, then the time for cure shall be extended for additional thirty (30) day periods upon written requests by Company as reasonably necessary to effect the cure (such total extension not to exceed ninety (90) days), provided that Company promptly commences to cure within said period and at all times thereafter proceeds diligently to cure the failure.

12.2.3 Bankruptcy. Georgetown may terminate this Agreement and the license granted under this Agreement upon Company's making of an assignment for the benefit of creditors or being adjudicated bankrupt; or the placing of all or substantially all of Company's assets in the control of a receiver or trustee for the benefit of creditors and the receivership or trusteeship continues for a period of ninety (90) days; or Company's instituting proceedings under the federal bankruptcy laws relating to insolvency of debtors, wherein Company seeks to be adjudicated bankrupt or to be discharged of its debts, or to affect a plan of liquidation or reorganization; or the instituting by others of those proceedings against Company, and Company consents thereto or acquiesces therein by pleading or default, or those proceedings are not contested and discharged within ninety (90) days. (The foregoing events are collectively referred to as "**Bankruptcy**").

12.2.4 Underreporting or Underpayment. Georgetown may terminate this Agreement if an examination by Accountant pursuant to Article 10 (Record Keeping) shows an underreporting or underpayment by Company in excess of ten percent (10%) for any twelve (12)-month period and the Company fails to make the payment stated in Section 10.5 within thirty (30) days of notification from Georgetown to Company of such underreporting or underpayment provided no such amount is in dispute. Should the company dispute such amount, the Parties shall try to settle such conflict pursuant to Section 14.10 on Dispute Resolution.

12.2.5 Termination for Patent Validity Challenge. Georgetown shall have the right to terminate this Agreement by written notice to Company in the event of a Patent Validity Challenge by Company or Sublicensee.

12.3 Termination by Company. Company may terminate this Agreement as to one or more countries, upon ninety (90) days advance written notice of termination specifying the country(ies), and shall pay to Georgetown all payments due through the effective date of the termination with respect to those country(ies), including without limitation royalties, fees, and Patent Expenses. If the ninety (90) days encompasses a patent prosecution or maintenance deadline, Georgetown shall be relieved of its obligations under Article 7 with respect to meeting that deadline. In the event Company terminates this Agreement as to all Licensed Territories, for the reason other than non-performance of Patent Rights and/or

Licensed Technology, Company shall pay to Georgetown a termination fee of thirty thousand dollars ($30,000).

12.4 Mutual Termination. Georgetown and Company can mutually agree in writing to terminate the Agreement. Such mutual termination shall not inaffect the surviving responsibilities of the Party except as may be specified in such mutual termination agreement.

12.5 Survival. Expiration or termination of this Agreement does not relieve either Party of any obligation which arises before expiration or termination, including without limitation obligations for payment and reporting. Any provision of this Agreement which contemplates performance or observance subsequent to any termination or expiration of this Agreement shall survive any termination or expiration of this Agreement and continue in full force and effect, including without any limitations the following: Article 6 (Financial Provisions), Article 10 (Record Keeping); Section 12.7.4 (Disposition of Licensed Products on Hand), Article 8 (Confidentiality); Article 13 (Representations & Disclaimer of Warranties); and Article 14 (General).

12.6 Upon expiration or termination of this Agreement in whole or in part for any reason:

12.6.1 Upon the expiration, or termination by Company for Georgetown's breach, of this Agreement, the licenses granted to Company in Section 3.1 shall survive to the extent required for the Parties to fulfill their obligations and realize their rights under this Agreement;

12.6.2 Upon termination by Georgetown for Company's breach, the licenses granted to Company in Section 3.1 shall terminate, and Company shall not thereafter have any license or other rights to the Patent Rights subject to other provisions of this Section 12;

12.6.3 Ninety (90) days after the effective date of expiration or termination, Company shall submit a final Royalty Report and pay to Georgetown all amounts due under this Agreement, including without limitation royalties, fees, and Patent Expenses;

12.6.4 Subject to Article 7. Patent Prosecution, Company shall be obligated to pay Patent Expenses incurred during the period following the effective date of termination or expiration: (a) sixty (60) days in the event of expiration or termination by Georgetown pursuant to Section 12.2; or (b) ninety (90) days in the event of a termination by the Company pursuant to Section 12.3; provided, however, that Georgetown shall use reasonable efforts to minimize the Patent Expenses incurred during the applicable period;

12.6.5 Company shall not thereafter grant to any Third Party any rights in the Patent Rights;

12.6.6 Subject to Sections 12.7.4 and 12.7.5, Company shall immediately either deliver to Georgetown, or destroy and certify to Georgetown in writing the destruction of all products included within the Patent Rights. Notwithstanding the foregoing, should any such materials be the information that Company cannot destroy due to any

regulatory requirements, Company shall maintain and treat such information confidential pursuant to Article 8 (Confidentiality) and shall provide Georgetown a copy of the same for its record.

12.7 Upon Termination:

12.7.1 In the event of termination of this Agreement, as opposed to expiration, and except in the instance termination is due to Georgetown's breach of this Agreement, Georgetown shall have a worldwide, royalty-free, sublicensable, perpetual license to use (1) the results of any product or process development, clinical trial and manufacturing development conducted or sponsored by Company used in or necessary for the use of or manufacture of any Licensed Product, and related documents and materials associated with such results, and (ii) the information contained in any regulatory filings and related documents and materials associated with submissions for regulatory approvals relevant to any Licensed Product as of the date of termination, in each case to the extent Company has the right to grant such a license. Company shall provide Georgetown with full access to the foregoing. In the event such termination occurs due to Non-Performance of Invention or Patent Rights, Georgetown may negotiate a royalty-bearing license with the Company to use the foregoing. The royalties paid by Georgetown to Company under such a license shall not exceed $250,000 for the term of such license. Non-Performance of Invention or Patent Rights shall mean failure to meet primary or secondary clinical end points established in any Clinical Trial.

12.7.2 In the event of termination of this Agreement, as opposed to expiration, Georgetown shall have the right to negotiate a royalty-bearing exclusive or non-exclusive sublicensable worldwide, license to make, have made, use, sell, offer for dale, have sold, import, export, commercialize and market intellectual property in the Licensed Field owned solely by Company or owned jointly by Company and Georgetown. The financial terms of said license shall be commercially reasonable and negotiated in good faith between the Parties. If the Parties are unable to arrive at mutually satisfactory terms and conditions within one year of the date of the disclosure notice, either Party may elect to submit the agreement to a binding determination by a Third Party, mutually acceptable, expert in licensing and royalty rate in the pharmaceutical/biotech industry within sixty (60) days thereafter. In making its decision, the Third Party expert shall determine the financial terms and conditions that would be contained in a commercially reasonable license agreement between two independent arm's length parties.

12.7.3 Georgetown shall have the right to negotiate a royalty-free exclusive or non-exclusive, sublicensable, worldwide, perpetual license to use any and all trademarks, service marks, and trade names owned solely by Company associated solely with License Products, unless the Licensed Product is approved by a regulatory agency and the Licensed Product is being sold, in which case Georgetown will negotiate a royalty-bearing license. The financial terms of said license shall be commercially reasonable and negotiated in good faith between the Parties. If the Parties are unable to arrive at mutually satisfactory terms and

conditions within one year of the date of the disclosure notice, either Party may elect to submit the agreement to a binding determination by a Third Party mutually acceptable expert in licensing and royalty rate in the pharmaceutical/biotech industry within sixty (60) days thereafter. In making its decision, the Third Party expert shall determine the financial terms and conditions that would be contained in a commercially reasonable license agreement between two independent arm's length parties.

12.7.4 Notwithstanding any provision of this Article 12 to the contrary, Company and Sublicensee may Sell Licensed Product in inventory at the time of the termination of this Agreement for any reason, and may complete Licensed Product in the process of manufacture at such time and sell the same, provided that the sale of such Licensed Product by Company or Sublicensee shall be subject to the terms of this Agreement, including but not limited to the rendering of reports and payment of royalties required under this Agreements;

12.7.5 If Company chooses not to sell Products in its inventory at the time of termination, Company shall immediately either deliver to Georgetown, or destroy and certify to Georgetown in writing the destruction of all products or other materials included within the Patent Rights;

12.7.6 Upon expiration or termination, each Party shall execute and deliver any agreements, instruments, and documents as are reasonably necessary or appropriate to carry out the terms and conditions of this Agreement, including without limitation in connection with prosecuting any patent application(s) or otherwise obtaining Patent Rights.

ARTICLE 13. REPRESENTATIONS & DISCLAIMER OF WARRANTIES

13.1 Representations by Company.

13.1.1 Company is validly existing and in good standing under the laws of its jurisdiction of incorporation, with full corporate power and authority to conduct its business, to own or use the assets that it purports to own or use and to perform all of its obligations under this Agreement.

13.1.2 To Company's actual knowledge, all information provided by Company to Georgetown in connection with this Agreement or the discussions or subject matter relating to this Agreement, including information relating to Company and its officers, directors (or equivalent), employees, donors, supporters, stockholders (as applicable) and other stakeholders, affiliates, representatives and agents (the "**Company Information**"), is true, complete and correct. No **Company Information** contains an untrue statement or omits to state a material fact necessary to make the statements therein or in this Agreement, in light of the circumstances in which they were made, misleading.

13.1.3 This Agreement constitutes or will constitute the legal, valid and binding obligation of Company, enforceable against Company in accordance with its terms. Company and the signatories to this Agreement are fully authorized and have the absolute and unrestricted right, power, authority and capacity to execute and deliver this Agreement, and to perform Company's obligations under this Agreement.

13.1.4 Neither the execution and delivery of this Agreement nor the performance of Company's obligations under this Agreement will contravene, conflict with or result in a violation of (i) any provision of the organizational or governing documents of Company, (ii) to the Company's actual knowledge, any applicable law or (iii) any material agreement or obligation of Company in a manner that might adversely impact Company's right, power, authority, capacity or ability to perform Company's obligations under this Agreement.

13.2 Representations by Georgetown.

13.2.1 Georgetown has the authority to enter into this Agreement. Georgetown does not warrant the validity of the Patent Rights licensed hereunder and makes no representations whatsoever with regard to the scope of the licensed Patent Rights or that such Patent Rights may be exploited by Company or Sublicensee without infringing other patents.

13.2.2 GEORGETOWN EXPRESSLY DISCLAIMS ANY AND ALL IMPLIED OR EXPRESS WARRANTIES AND MAKES NO EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OF THE PATENT RIGHTS, OR INFORMATION SUPPLIED BY GEORGETOWN OR LICENSED PRODUCTS CONTEMPLATED BY THIS AGREEMENT.

13.2.3 Georgetown is validly existing and in good standing under the laws of its jurisdiction of incorporation, with full corporate power and authority to conduct its business, to own or use the assets that it purports to own or use and to perform all of its obligations under this Agreement.

13.2.4 This Agreement constitutes or will constitute the legal, valid and binding obligation of Georgetown, enforceable against Georgetown in accordance with its terms except where enforceability is limited by (A) bankruptcy, insolvency, reorganization, moratorium, fraudulent conveyance or other similar statutes, rules, regulations or other laws affecting the enforcement of creditors' rights and remedies generally, (B) the unavailability of, or limitation on the availability of, a particular right or remedy (whether in a proceeding in equity or at law) because of an equitable principle or a requirement as to commercial reasonableness, conscionability or good faith and (C) the discretion of courts of competent jurisdiction in granting equitable remedies including the remedies of specific performance and injunction. Georgetown and the signatories to this Agreement are fully authorized and have the absolute and unrestricted right, power, authority and capacity to execute and deliver this Agreement, and to perform Georgetown's obligations under this Agreement.

ARTICLE 14. GENERAL

14.1 Indemnification.

14.1.1 Company shall indemnify, defend, and hold harmless Georgetown and its current or former directors, governing board members, trustees, officers, faculty, medical and professional staff, employees, students, and agents and their respective successors, heirs, and assigns (collectively, the "**Indemnitees**"), from and against any claim, liability, cost, expense, damage, deficiency, loss, or obligation of any kind or nature (including, without limitation, reasonable attorney fees and other costs and expenses of litigation) (collectively, "**Claims**"), based upon, arising out of, or otherwise relating to this Agreement, including without limitation any cause of action relating to product liability or other liability concerning any product, process, or service, made, used, or sold pursuant to any right or license granted under this Agreement. For the avoidance of doubt, Company's indemnification obligations set forth in this Section 14.1.1 shall not include any indemnification for any Claims arising out of Georgetown's non-exclusive licensees' use of Patent Rights or Licensed Products pursuant to Section 3.2.

14.1.2 Company shall, at its own expense, provide attorneys reasonably acceptable to Georgetown to defend against any actions brought or filed against any **Indemnitee** hereunder with respect to the subject of indemnity contained herein, whether or not such actions are rightfully brought.

14.1.3 Georgetown will indemnify, defend and hold Company, its directors, staff, officers, employees, contractors, subcontractors and agents harmless against any and all third party claims for loss, damage, or injuries in connection with or arising out of Georgetown's negligent acts or omissions with respect to Georgetown's use of the Patent Rights or Licensed Products pursuant to Section 3.2, except in the case of research at Georgetown sponsored by the Company. Such indemnity shall include all costs and expenses, including attorney's fees and any costs of settlement. The rights and obligations of this section shall survive termination or expiration of this Agreement.

14.2 Insurance.

14.2.1 Beginning at the time Licensed Product is first commercially distributed or Sold (other than for the purpose of obtaining regulatory approvals) by Company, a Sublicensee, or agent of Company, Company, its Affiliates or Sublicensees shall, at its sole cost and expense, procure and maintain commercial general liability insurance in amounts not less than five-million dollars ($5 million) per occurence and five-million dollars ($5 million) in the aggregate. During clinical trials of any such Licensed Product, Company, its Affiliates or Sublicensees shall, at its sole cost and expense, procure and maintain commercial general liability insurance in such equal or lesser amount as Georgetown shall require which shall be not less than five-million dollar ($5 million) per occurence and five-million dollars ($5 million) in the aggregate, naming the Indemnitees as additional insureds. The

Company shall provide evidence of professional liability insurance covering the principal investigator.

14.2.2 Company (or its Affiliates or Sublicensees) shall provide Georgetown with written evidence of such insurance meeting the requirements of Section 14.2.1 upon request of Georgetown. Company shall provide Georgetown with written notice at least fifteen (15) days prior to the cancellation, renewal, or material change in such insurance.

14.2.3 Company, its Affiliates or Sublicensees shall maintain such commercial general liability insurance beyond the expiration or termination of this Agreement during:

a. the period that any Licensed Product is being commercially distributed or sold by Company, Sublicensee, or agent of Company; and

b. a reasonable period after the period referred to in Section 14.2.3 (a), with reasonableness defined as the term necessary to exhaust all applicable statute of limitation.

Georgetown may periodically review the adequacy of the minimum limits of liability insurance specified in section 14.2.1 and Georgetown reserves the right to request Company, its Affiliates or Sublicensees to adjust the liability insurance coverages. The specified minimum insurance amounts do not constitute a limitation on Company's, its Affiliates or Sublicensees' obligation to indemnify Georgetown under this agreement.

14.2.4 Company's insurance shall be primary coverage; any insurance Georgetown may purchase shall be excess and non-contributory. Company's insurance shall be written to cover claims incurred, discovered, manifested, or made during or after the expiration of the Agreement.

14.3 Other agreements. In the event Parties wish to transfer any material or data from one Party to the other Party related to Invention and/or Patent Rights, such transfer shall occur upon mutual consent of the Parties and upon execution of a separate agreement such as Data Transfer Agreement, Material Transfer Agreement or Sponsored Research Agreement, as the case may be. Any such agreement shall not conflict with the terms and conditions of this Agreement. Georgetown shall amend the Agreement to include such agreement as a Schedule to this Agreement.

14.4 Use of Name. Neither Party shall use the other Party's name or insignia (or any adaptation of them), trademarks, or the name of any inventors in any advertising, promotional, or sales literature, press release or public communications without the prior written approval of the other Party. In the event that Company, Affiliate or an assignee terminates this Agreement, the Parties shall mutually agree on the rationale for such termination in the press release that Georgetown shall make on such termination.

14.5 Assignment. Except as otherwise provided in this Agreement, without the prior written approval of Georgetown, approval not to be unreasonably withheld, in each instance, neither this Agreement nor the rights granted hereunder shall be transferred nor assigned

in whole or in part by Company to any Third Party whether voluntarily or involuntarily. Notwithstanding the foregoing, Company may assign this Agreement without the prior written consent of Georgetown in the event of a merger with a Third Party, in the event of an acquisition of Company by a Third Party, or in connection with the sale of substantially all of Company's assets relating to this Agreement to a Third Party, provided such Third Party in each incident 1) has the financial ability to acquire or partner with Company and to operate Company following such acquisition; 2) assumes all obligations owed to Georgetown in this Agreement; 3) agrees to comply in all respects with the terms, conditions, and provisions of this Agreement, and provides prompt notice thereof including plans for continued development of and/or sales of Licensed Product, in any event not less than ten (10) business days prior to closing of an acquisition or sale transaction; and 4) is not involved in a legal proceeding and has not threatened any legal proceeding or made another against Georgetown. This Agreement shall be binding upon the respective successors, legal representatives, and assignees of Georgetown and Company. Any attempted assignment, transfer or delegation in breach of this provision will be deemed to be void and no effect.

14.6 Governing Law. All questions regarding patents and inventorship will be determined in accordance with U.S. Patent laws. In all other respects, the interpretation and application of the provisions of this Agreement shall be governed by the laws of Delaware without regard to its conflict of laws provisions.

14.7 Compliance with Laws. Company shall comply with all applicable United States and foreign laws and regulations with respect to the performance of its obligations under this Agreement and the development, marketing, and Sale of Licensed Products. In particular, it is understood and acknowledged that the transfer of certain commodities and technical data is subject to United States laws and regulations controlling the export of such commodities and technical data, including without limitation all Export Administration Regulations of the United States Department of Commerce and the International Traffic in Arms Regulations. These laws and regulations, among other things, prohibit or require a license for the export of certain types of technical data to certain specified countries. Georgetown represents neither that a license will not be required nor that, if required, such a license will be issued. Company hereby agrees and gives written assurance that it will comply with all United States laws and regulations controlling the export of commodities and technical data, that it will be solely responsible for any violation of such by Company or Sublicensee, and that Company will defend and hold Georgetown harmless in the event of any legal action of any nature occasioned by such violation. Any costs associated with obtaining and/or maintaining export licenses will be borne by Company.

14.8 Notices. Any notices to be given hereunder shall be sufficient if signed by the Party (or Party's attorney) giving same and either (a) delivered in person, or (b) mailed certified mail return receipt requested, or sent by overnight courier, such as Federal Express, or (c) e-mailed or faxed to other Party if the sender has evidence of successful transmission and if the sender promptly sends the original by ordinary mail, in any event, to the addresses below. Notices delivered in person shall be deemed given on the date delivered; notices sent by fax shall be deemed given on the date faxed; notices mailed shall be deemed to be

received on the third business day following the date postmarked on the envelope. Notices sent by overnight courier shall be deemed received the following Business Day.

If to Company:

Scott Glenn, **President and CEO**

Tokalas, **Inc**.

1737 Grand Avenue

Del Mar, **CA 92014**

If to Georgetown:

By courier:
Vice President
Office of Technology Commercialization
Georgetown University
Harris Building, Suite 1500
3300 Whitehaven St, NW
Washington, DC 20007
Fax: 202-687-3111

By United States Postal Service:

Vice President
Office of Technology Commercialization
Georgetown University
Box 571408
Washington, DC 20057-1408

By such notice either Party may change their address for future notices.

14.9 Severability. Should a court of competent jurisdiction later hold any provision of this Agreement to be invalid, illegal, or unenforceable, and such holding is not reversed on appeal, such provision shall be considered severed from this Agreement. All other provisions, rights, and obligations shall continue without regard to the severed provision, provided that the remaining provisions of this Agreement are in accordance with the intention of the parties.

14.10 Dispute Resolution. In the event of any controversy or claim arising out of or relating to any provision of this Agreement or the breach thereof, the Parties shall try to settle such conflict amicably between themselves. Subject to the limitation stated in the final sentence of this section, any such conflict which the Parties are unable to resolve promptly shall be settled through arbitration conducted in accordance with the rules of the American Arbitration Association. The demand for arbitration shall be filed within a reasonable time after the controversy or claim has arisen, and in no event after the date upon which

institution of legal proceedings based on such controversy or claim would be barred by the applicable statute of limitation. Such arbitration shall be held in the state of Maryland. The award through arbitration shall be final and binding. Either Party may enter any such award in a court having jurisdiction or may make application to such court for judicial acceptance of the award and an order of enforcement, as the case may be. Notwithstanding the foregoing, either Party may, without recourse to arbitration, assert against the other Party a Third-Party claim or cross-claim in any action brought by a Third Party, to which the subject matter of this Agreement may be relevant.

14.11 Independent Contractors. It is expressly agreed that Georgetown and Company shall be independent contractors and that the relationship between the two parties shall not constitute a partnership, joint venture, or agency. Neither Georgetown nor Company shall have the authority to make any statements, representations, or commitments of any kind, or to take any action, which shall be binding on the other Party, without the prior written consent of the other Party.

14.12 Waiver. No provision of the Agreement shall be waived by any act, omission, or knowledge of a Party or its agents or employees except by an instrument in writing expressly waiving such provision and signed by a duly authorized officer of the waiving Party. Such waiver shall not be deemed a waiver of any other right hereunder or of any other breach or failure by a Party whether of similar nature or otherwise.

14.13 Entire Agreement. This Agreement, the Confidential Disclosure Agreement between Georgetown and Windamere Venture Partners, LLC effective as of November 13, 2013, and the Confidential Disclosure Agreement between Georgetown and Company effective as of January 25, 2014 constitute the entire agreement between the Parties and neither Party shall be obligated by any condition or representation other than those expressly stated herein or as may be subsequently agreed to by the Parties hereto in writing. All Confidential Information shared before the Effective Date shall be governed by the terms and conditions of the respective Confidentiality Disclosure Agreement. Any Confidential Information shared after the Effective Date of this Agreement shall be governed by the terms of Article 8 under this Agreement.

14.14 Force Majeure. No liability hereunder will result to a Party by reason of delay in performance caused by force majeure that is circumstances beyond the reasonable control of the Party, including, without limitation, acts of God, fire, flood, earthquake, war, terrorism, civil unrest, labor unrest, or shortage of or inability to obtain material or equipment.

14.15 No Endorsement. By entering into this Agreement, Georgetown neither directly nor indirectly endorses any product or service provided, or to be provided by Company, whether directly or indirectly related to this Agreement. Company will not state or imply that this Agreement is an endorsement by Company or its employees.

14.16 Proprietary Rights. Company will not, by performance under this Agreement, obtain any ownership interest in Patent Rights or any other proprietary rights or information of Georgetown, its officers, inventors, employees, students, or agents.

14.17 Headings. The headings of the sections of this Agreement are inserted for convenience and reference only, and are not intended to be a part of or to affect the meaning or interpretation of this Agreement.

14.18 Counterparts. This Agreement may be executed in counterparts, each of which shall be deemed an original, but all of which together shall be deemed to be one and the same agreement. A signed copy of this Agreement delivered by facsimile, e-mail or other means of electronic transmission shall be deemed to have the same legal effect as delivery of an original signed copy of this Agreement.

[SIGNATURE PAGE FOLLOWS]

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed by their duly authorized representatives.

GEORGETOWN UNIVERSITY

/s/ Claudia C. Stewart, Ph.D.
Claudia C. Stewart, Ph.D.
Vice President
Office of Technology Commercialization

03/26/2014
Date

TOKALAS, INC.

/s/ Scott L. Glenn
Scott L. Glenn
President, CEO

3/26/14
Date

SCHEDULE A: PATENT RIGHTS

[***]

SCHEDULE B: COMPANY'S DEVELOPMENT PLAN

TOKALAS DEVELOPMENT PLAN
FEBRUARY 2014

[***]

SCHEDULE C: MILESTONES

[***]

SCHEDULE D: MILESTONE PAYMENTS

Company shall make the following payments to Georgetown upon Company or Sublicensee achieving the milestones as set forth below.

[***]

SCHEDULE E: LOW AND MIDDLE INCOME ECONOMIES

Afghanistan
Albania
Algeria
American Samoa
Angola
Argentina
Armenia
Azerbaijan
Bangladesh
Belarus
Belize
Benin
Bhutan
Bolivia
Bosnia and Herzegovina
Botswana
Brazil
Bulgaria
Burkina Faso
Burundi
Cambodia
Cameroon
Cape Verde
Central African Republic
Libya
Macedonia, FYR
Madagascar
Malawi
Malaysia
Maldives
Mali
Marshall Islands
Mauritania
Mauritius
Mexico
Micronesia, Fed. Sts.
Moldova
Mongolia
Montenegro
Morocco
Mozambique
Myanmar
Namibia
Nepal
Nicaragua
Niger
Nigeria
Pakistan

Chad

China

Colombia

Comoros

Congo, Dem. Rep.

Congo, Rep.

Costa Rica

Cote d’Ivoire

Cuba

Djibouti

Dominica

Dominican Republic

Ecuador

Egypt, Arab Rep.

El Salvador

Eritrea

Ethiopia

Fiji

Gabon

Gambia, The

Georgia

Ghana

Grenada

Guatemala

Guinea

Palau

Panama

Papua New Guinea

Paraguay

Peru

Philippines

Romania

Rwanda

Samoa

Sao Tome and Principe

Senegal

Serbia

Seychelles

Sierra Leone

Solomon Islands

Somalia

South Africa

South Sudan

Sri Lanka

St. Lucia

St. Vincent and the Grenadines

Sudan

Suriname

Swaziland

Syrian Arab Republic

Guinea-Bissau

Guyana

Haiti

Honduras

Hungary

India

Indonesia

Iran, Islamic Rep.

Iraq

Jamaica

Jordan

Kazakhstan

Kenya

Kiribati

Korea, Dem. Rep.

Kosovo

Kyrgyz Republic

Lao PDR

Lebanon

Lesotho

Liberia

Tajikistan

Tanzania

Thailand

Timor-Leste

Togo

Tonga

Tunisia

Turkey

Turkmenistan

Tuvalu

Uganda

Ukraine

Uzbekistan

Vanuatu

Venezuela, RB

Vietnam

West Bank and Gaza

Yemen, Rep.

Zambia

Zimbabwe

FIRST AMENDMENT TO EXCLUSIVE LICENSE AGREEMENT BETWEEN

GEORGETOWN UNIVERSITY
AND
TOKALAS, INC.

This First Amendment to the Exclusive License Agreement (the "First Amendment") effective as of 17th day of March, 2016 (the "First Amendment Effective Date"), by and between, Georgetown University, a nonprofit institution of higher education organized as a non-stock corporation under federal charter, having its principal place of business located at 37th and O Streets, N.W., Washington, D.C. 20057 (referred to as "Georgetown") and TOKALAS, INC., a for-profit company having its principal office at principal office 1737 Grand Avenue, Del Mar, CA 92014 ("Company") defines the terms of the confidential relationship between the aforementioned parties (hereafter referred to as the "Parties" collectively or "Party" individually).

BACKGROUND

WHEREAS, the Parties entered into an Exclusive License Agreement having an Effective Date of March 28,2014 (referred herein to as the "Agreement");

WHEREAS, Company has a potential investor who desires to invest in the commercialization of Patent Rights;

WHEREAS, Company has made some novel compounds using the know-how included in the Patent Rights and is willing to include the new composition under the license as a Licensed Product;

NOW THEREFORE, in consideration of the mutual promises and covenants set forth below, the Parties agree to be legally bound and to amend the Agreement as follows:

I. Section 2.21 of the Agreement is hereby deleted in its entirety, and is replaced with the following:

> **2.21 "Licensed Product":** means either of the following: a) Any and all products or processes in the Licensed Fields, the making, use, offer for sale, sale, importation, or rendering of which, but for the license granted in this Agreement, would Infringe one or more claims of the Patent Rights in the country in which it is made, used, sold, offered for sale, imported, or rendered; or (b) any and all products in the Licensed Fields, the make, use, sale, or manufacture of which relies on a process(es) which, but for the license granted in this Agreement would Infringe one or more claims of the Patent Rights in the country in which it is made, used, sold, offered for sale, imported, or rendered. For the purposes hereof, a claim set forth in an application within the Patent Rights that has not been abandoned or finally rejected in a decision that is unappealable or unappealed within the time allowed for appeal shall be

deemed a claim for the purposes of determining a Licensed Product. The invalidity of a particular claim in one or more countries shall not invalidate such claim in the remaining countries of the Licensed Territory; or c) TK-216-2. Notwithstanding the foregoing, if Company develops any product that is made using directly or indirectly the Patent Rights or the know-how included in the Patent Rights, Company should immediately inform Georgetown of the same and the Parties will discuss whether or not such product will be considered as a Licensed Product.

IN WITNESS WHEREOF, the parties have caused this First Amendment to the Agreement to be duly executed and delivered by duly authorized officers as of the date first written above.

GEORGETOWN UNIVERSITY

By: /s/ Claudia C. Stewart, Ph.D.
Name: Claudia C. Stewart, Ph.D.
Title: Vice President,
Office of Technology Commercialization
Date: 3/17/16

TOKALAS, INC.

By: /s/ James Breitmeyer
Name: James Breitmeyer
Title: President & CEO
Date: 3/17/16

Exhibit 10.49

***CERTAIN MATERIAL (INDICATED BY THREE ASTERISKS IN BRACKETS) HAS BEEN OMITTED FROM THIS DOCUMENT BECAUSE IT IS BOTH (1) NOT MATERIAL AND (2) WOULD BE COMPETITIVELY HARMFUL IF PUBLICLY DISCLOSED.

COLLABORATION AGREEMENT

This Collaboration Agreement ("Agreement"), effective as of December 15, 2014 ("Effective Date"), is by and between Tokalas, Inc. ("Tokalas") and The University of Texas M. D. Anderson Cancer Center ("MD Anderson"). Tokalas and MD Anderson are sometimes referred to collectively herein as the "Parties" or individually as a "Party." Based upon the Background below, and for and in consideration of the covenants, conditions, and undertakings hereinafter set forth, the Parties hereby acknowledge, confirm, and agree as follows:

Background

A. MD Anderson is an agency of the State of Texas, an institution of higher education within The University of Texas System ("UT System"), and a comprehensive cancer research, treatment, and prevention center.

B. Tokalas is a biotechnology company focused on the discovery and development of innovative drugs and biologies for the treatment of cancer.

C. MD Anderson and Tokalas wish to conduct a research collaboration involving certain preclinical and clinical research including: (a) collection of tumor biopsies for generation of PDXs; (b) a Phase 1 3+3 dose escalation study of Tokalas' proprietary drug TK-216 in Ewing's Sarcoma; (c) a Phase 1b clinical study of TK-216 in (i) fifteen (15) additional Ewing's Sarcoma patients and ten (10) AML patients, and (ii) fifteen (15) additional Ewing's Sarcoma patient's and no additional AML patients; and (d) potentially certain additional non-standard research studies ((a)-(d) collectively, the "Collaboration").

D. Accordingly, the Parties are entering into this Agreement to set forth the terms and conditions of the Collaboration.

1. Definitions.

1.1 "Affiliates" will mean any individual, company, partnership or other entity which directly or indirectly, at present or in the future, controls, is controlled by or is under common control of a Party, and "control" will mean direct or indirect beneficial ownership of at least fifty percent (50%) of the voting share capital in such company or other business entity, or to hold the effective power to appoint or dismiss members of the management. Notwithstanding the foregoing, neither UT System nor other member institutions of UT System will be considered Affiliates of MD Anderson for purposes of this Agreement.

1.2 "Arising IP" will mean: (a) any invention or discovery, whether patentable or not, that is conceived, discovered, developed or first reduced to practice by either Party, or jointly by the Parties, during performance of the Collaboration and which directly arises from the conduct of the Collaboration; and (b) any Patents claiming any Arising IP described in subclause 1.2(a).

1.3 "Background IP" will mean all Patents, know-how and other intellectual property of a Party that: (a) was generated by such Party before the Effective Date; or (b) is generated by such Party outside the scope of the Collaboration and this Agreement or after expiration of this Agreement and; in each such case; (c) is owned by such Party, either partially or wholly, or is licensed to, or otherwise controlled by such Party, and which is not Arising IP under this Agreement.

1.4 "Data" will mean the information, data, analysis, and/or results directly made, collected or otherwise generated under the Collaboration.

1.5 "Investigators" will mean MD Anderson investigators Joseph Ludwig and Hagop Kantarjian.

1.6 "IP Limits" will mean that the rights granted by MD Anderson to Tokalas in Arising IP may not violate the relevant laws of the United States of America and the State of Texas, and may not, as determined by UT System Tax Counsel, result in private business use and/or adverse tax consequences with respect to any of the tax-exempt bonds issued by UT System or covering any of MD Anderson's facilities.

1.7 "Patent" will mean a patent or a patent application and any patents issuing therefrom, including any additions, divisions, continuations, continuations-in-part, invention certificates, substitutions, reissues, reexaminations, extensions, registrations, supplementary protection certificates and renewals, and foreign counterparts to any of the foregoing.

1.8 "Patent Costs" will mean the reasonable, out-of-pocket, actual costs of preparing, filing, prosecuting, maintaining, and defending Patent rights and Patents.

2. Scope, Conduct, and Funding of Collaboration.

2.1 The scope of the Collaboration will consist of the collaborative research described in Exhibit A attached hereto. MD Anderson and Tokalas will use commercially reasonable diligent efforts to perform and complete the Collaboration under the terms of and subject to this Agreement. The Collaboration will be initiated at Stage 1 as described in Exhibit A, and will continue through Stage 3 unless terminated in accordance with applicable provisions of Article 7. Research studies under Stage 4 will be optional, and will be integrated into the Collaboration: (a) upon written agreement by Tokalas; and (b) applicable to the expansion cohorts in Stage 3, but only to the extent that significant clinical activity is noted in Stage 2 (dose escalation).

2.2 MD Anderson and Tokalas will use their own facilities and reasonable best efforts to conduct the Collaboration in accordance with the terms of this Agreement, applicable laws and regulations, prudent research practices, and applicable policies and procedures of such Parties.

2.3 With the exception of the Funding (as defined herein) and materials provided by a Party to another Party for the conduct of the Collaboration, each Party will arrange and provide all necessary personnel, equipment, supplies, laboratory services, facilities and resources required to perform its obligations and activities under the Collaboration and will be fully responsible for the activities of its personnel to whom activities under the Collaboration are delegated. All matters of compensation, benefits and other terms of engagement of any nature for any personnel used in the Collaboration will be solely a matter between the applicable Party and such individuals, regardless of whether such individuals are considered employees, agents or independent contractors of such Party.

2.4 Tokalas understands and acknowledges that the development and dissemination of scientific knowledge is a fundamental component of MD Anderson's mission, and that MD Anderson makes no representations, warranties, or guarantees with respect to any specific outcome or results of the Collaboration.

2.5 MD Anderson and Tokalas will take appropriate steps to inform their respective personnel of their obligations under this Agreement and will ensure that such personnel are obligated to abide by the terms and conditions of this Agreement in the same manner as such Party.

2.6 Other than Data which shall be exchanged and used consistent with Section 3 below, upon conclusion of the Collaboration, each Party will immediately discontinue use of all materials and information provided by the other Party for the Collaboration and will destroy all such material and information or arrange for their return to the other Party at the other Party's expense.

2.7 MD Anderson will not employ any individual or entity debarred by the FDA (or subject to a similar sanction of the EMA), or any individual who or entity which is the subject of an FDA debarment investigation or proceeding (or similar proceeding of EMA), in the conduct of the Collaboration, including without limitation in the conduct of any clinical study under the Collaboration.

2.8 To fund the Collaboration, Tokalas will pay MD Anderson in the amounts identified and on the schedule described in Exhibit B, attached hereto ("Funding"). Funding is non-refundable upon payment, subject to the pro-rata payment requirements set forth in Exhibit B. Additionally, Tokalas will provide MD Anderson with sufficient quantities of TK-216 ("Tokalas Drug") for the conduct of the Collaboration, including for any clinical studies conducted under the Collaboration, at no cost to MD Anderson.

2.9 Tokalas will be responsible for obtaining and maintaining all regulatory filings required for the Collaboration, including without limitation any Investigational New Drug application ("IND") for any clinical study under the Collaboration, and will conduct any monitoring and reporting as required by such regulatory filings at Tokalas' expense.

2.10 MD Anderson will be responsible for obtaining any internal approval necessary for the conduct of the Collaboration at MD Anderson, including without limitation obtaining IRB approval of any clinical study conducted under the Collaboration, and the cost thereof.

2.11 Nothing in this Agreement will restrict or limit either Party or any of such Party's respective personnel from conducting any research or from performing research for or with any other person or party, including without limitation Tokalas' contracting with other institutions for the conduct of clinical trials.

3. Data and Reporting.

3.1 All Data will be promptly disclosed by the Parties to each other and will be owned solely by Tokalas, provided, however, that MD Anderson may publish or make public Data in accordance with Article 6 below, and prior to publication or public disclosure, may use such Data for internal research, academic, and patient care purposes. During the term of this Agreement, MD Anderson will maintain the Data in confidence and will use Data solely for the conduct of the Collaboration, unless such Data has been published or publicly disclosed in accordance with Article 6 or as otherwise agreed upon in writing by the Parties. However, upon publication or public disclosure of any Data, MD Anderson may use such Data for any purpose. Tokalas will have the right to use, transfer or encumber its ownership interest in Data without an accounting or obligation to, or consent from MD Anderson.

3.2 MD Anderson and Tokalas will maintain records of their respective activities under the Collaboration in sufficient detail and in good scientific manner appropriate for scientific, patent and regulatory purposes, that will properly reflect all work performed in such Party's conduct of the Collaboration, for a period of at least seven (7) years after the creation of such records, but in no event less than as required by applicable law. Each Party will have the right to request and receive a copy of any such records of the other Party at its cost.

3.3 The Parties will provide each other, within thirty (30) days of the end of each calendar quarter, with written reports summarizing all Data and Arising IP. A final written report setting forth the Data and Arising IP generated under and pursuant to the Collaboration will be prepared and exchanged by the Parties within ninety (90) days after the expiration or termination of the Collaboration. MD Anderson will provide invention disclosure reports for Arising IP to Tokalas as appropriate and in accordance with the terms of this Agreement.

4. Background IP and Arising IP.

4.1 Each Party will retain all right, title and interest in and to its own Background IP and no license to use such Background IP is granted to the other party except for use in the performance of the Collaboration.

4.2 MD Anderson will provide to Tokalas a reasonably detailed written disclosure of Arising IP promptly upon becoming aware of such Arising IP.

4.3 Subject to the assignments and license grants set forth herein, Arising IP made solely by MD Anderson or its employees and agents initially will be solely owned by MD Anderson. Arising IP made jointly by MD Anderson and Tokalas and their employees and agents will initially be jointly owned by MD Anderson and Tokalas. Inventions that are made solely by Tokalas or its employees and agents will be solely owned by Tokalas. Inventorship will be determined in accordance with United States patent law.

4.4 As between the Parties, the owner of solely owned Arising IP, including by any permitted assignment pursuant to Section 4.6, will have the sole right to prepare, file, prosecute, maintain, enforce and defend all U.S. and foreign Patents, registrations and other forms of intellectual property in such Arising IP but nothing herein will obligate the owner to take any such actions. MD Anderson will notify Tokalas in confidence of all material developments and all steps to be taken in connection with filing, prosecuting and maintaining all Patents claiming Arising IP solely owned by MD Anderson and provide Tokalas with copies of all material filings or responses to be made to the patent authorities with respect to such Patents and all other material submissions and correspondence with any relevant Patent authorities regarding such Patents in sufficient time to allow for review and comment by Tokalas. Tokalas will offer its comments or proposals, if any, promptly, and MD Anderson will not unreasonably reject any such comments and proposals. As between the Parties, using counsel of its choice, Tokalas will have the first right, but not the obligation, to prepare, file, prosecute, maintain, enforce and defend all U.S. and foreign Patents, registrations and other forms of intellectual property in any jointly-owned Arising IP at the sole cost and expense of Tokalas. Tokalas will keep MD Anderson reasonably informed of all such preparations, filings, prosecution, maintenance, enforcement and defense and will consider MD Anderson's recommendations in good faith. If Tokalas elects not to file in the United States or not to maintain a Patent arising from any jointly-owned Arising IP, Tokalas will promptly notify MD Anderson within reasonable time for MD Anderson to file, prosecute or maintain such Patent, and MD Anderson will have the right to file, prosecute or maintain such Patent, at MD Anderson's sole cost and expense. For the purpose of this Article 4, "prosecution" will include any patent interference, opposition, pre-issuance third party submission, ex parte re-examination, post-grant review, *inter partes* review or other similar proceeding, appeals or petitions to any Board of Appeals in a patent office, the Patent Trial and Appeal Board, appeals to any court for any patent office decisions, reissue proceedings, and applications for patent term extensions and the like.

4.5 Notwithstanding Section 4.3 and rights in Arising IP set forth therein, subject to the IP Limits and Sections 4.6-4.9 hereunder Tokalas will have and MD Anderson grants to Tokalas a fully paid up, royalty free exclusive license to MD Anderson's rights in Arising IP.

4.6 In light of the IP Limits, the Parties will first assess upon disclosure of Arising IP if any Arising IP in which MD Anderson has an ownership interest can be exclusively licensed on an exclusive, royalty free basis to Tokalas as set forth in Section 4.5. MD Anderson will promptly notify Tokalas in the event MD Anderson has any concern that such royalty free exclusive licensure may violate the IP Limits, and the Parties will work in good faith to overcome any such concerns. If royalty free exclusive licensure would not violate the IP Limits, MD Anderson will exclusively license its interest in any Arising IP on a royalty free basis upon payment by Tokalas to MD Anderson of all Patent Costs, if any, incurred by MD Anderson in the filing, prosecution, issuance and/or maintenance of any Patent issuing thereon prior to the date of assignment to Tokalas. Further filing, prosecution, defense, maintenance and enforcement of any such Patent(s), as well as the costs thereof, will thereafter be the sole responsibility of Tokalas. MD Anderson will cooperate, and will cause all persons performing activities under the Collaboration to cooperate, with Tokalas to effectuate and perfect the foregoing exclusive licensure, including by promptly executing and recording documents consistent with such exclusive licensure. MD Anderson will not disclose any Arising IP or any Data related thereto to any third party prior to it being determined whether Arising IP in which MD Anderson has an ownership interest can be exclusively licensed on a royalty free basis to Tokalas, provided, however, that the foregoing will not restrict MD Anderson from publishing in accordance with Article 6, or exercising its Patent Rights in accordance with Section 4.4, or restrict MD Anderson from disclosing such information to MD Anderson's attorneys, independent accountants or financial advisors for the sole purpose of enabling such attorneys, independent accountants or financial advisors to provide advice to MD Anderson, provided, however, that in each such case on the condition that such attorneys, independent accountants and financial advisors are bound by confidentiality and non-use obligations substantially consistent with those contained in this Agreement. Notwithstanding the royalty free exclusive licensure of MD Anderson's rights in any Arising IP to Tokalas, MD Anderson will have and retain the perpetual, irrevocable, no-cost right to use any such Arising IP for non-commercial research, academic and patient care purposes.

4.7 Where royalty free exclusive licensure of Arising IP in which MD Anderson has an ownership interest would violate the IP Limits, MD Anderson will promptly notify Tokalas in writing of same, and MD Anderson hereby grants to Tokalas a non-exclusive, royalty free, sub-licensable, transferrable, fully paid-up, irrevocable, worldwide license to such Arising IP, which license will be subject to Tokalas' prompt payment of all actual and reasonable Patent Costs, if any, previously incurred by MD Anderson at the direction of Tokalas in connection with such Arising IP.

4.8 Subject to the IP Limits, Tokalas will have a time-limited first right to convert its non-exclusive license in any Arising IP in which MD Anderson has an ownership interest granted to Tokalas under Section 4.7 into an exclusive, sub-licensable, irrevocable, worldwide royalty bearing license to such Arising IP (the "Exclusivity Conversion"). Tokalas must exercise its Exclusivity Conversion by notifying MD Anderson in writing within ninety (90) days after receipt of notice of the Arising IP (the "Conversion Period"). If Tokalas timely exercises its Exclusivity Conversion, subject to the IP Limits Tokalas and MD Anderson will negotiate in good faith commercially reasonable terms of the exclusive, sub-licensable, irrevocable, worldwide royalty bearing license to such Arising IP, such terms to be negotiated in good faith within one hundred eighty (180) days of the date such Exclusivity Conversion is exercised, or within such longer period time as the parties may mutually agree in writing, provided, however, that such period will automatically be extended in the event that Tokalas and MD Anderson continue to negotiate in good-faith the terms and conditions of any such license (the "Negotiation Period"). Such license will be: (a) subject to Tokalas' prompt payment of all actual and reasonable Patent Costs previously incurred by MD Anderson, if any, and for the duration of the exclusive license; and (b) subject to in each and every case to MD Anderson's right to use the Arising IP for non-commercial research, academic, and patient care purposes. Prior to the expiration of the applicable Conversion Period or Negotiation Period, as applicable, MD Anderson will not grant any person or entity any rights in or to the applicable Arising IP.

4.9 If Tokalas fails to timely exercise its Exclusivity Conversion within the Conversion Period with respect to any Arising IP in which MD Anderson has an ownership interest, Tokalas' right to obtain an exclusive license with respect to such Arising IP will automatically terminate, and subject to the non-exclusive, royalty-free, fully-paid up, irrevocable, worldwide, sub-licensable license granted to Tokalas, MD Anderson will be free to negotiate and enter into non-exclusive licenses with any other parties. In addition, if Tokalas timely exercises its Exclusivity Conversion, but MD Anderson and Tokalas are unable to agree upon the terms of the license during the Negotiation Period, Tokalas' right to license such Arising IP on an exclusive basis will terminate, and subject to the non-exclusive, royalty-free, fully-paid up, irrevocable, worldwide, sub-licensable license granted to Tokalas, MD Anderson will be free to enter into non-exclusive licenses with any other parties. If Tokalas does not obtain an exclusive license to any Arising IP that is solely owned by MD Anderson, then in accordance with applicable law, MD Anderson may grant an equivalent non-exclusive, royalty-free license to such Arising IP to any person requesting a license to such Arising IP.

4.10 Notwithstanding anything in this Agreement, if MD Anderson successfully completes the Collaboration, i.e., provides all PDXs in Stage 1, and enrolls and completes trials on all patients as outlined in Stages 2 and 3 of the Collaboration, Tokalas will pay MD Anderson an amount equal to [***] of the net product sales of Tokalas Drug for Ewing's Sarcoma and AML up to a cumulative payment of US$1.0M.

5. Confidentiality.

5.1 In conjunction with the Collaboration, the Parties may wish to disclose confidential information to each other, provided that nothing herein will obligate either Party to disclose any particular information. For purposes of this Agreement, "Confidential Information" means confidential, non-public information, unpublished patent applications, know-how and data (technical or non-technical) that: (a) is disclosed in writing, orally, visually, graphically, in machine readable form, or in any other manner by or on behalf of the disclosing Party to the receiving Party or its Affiliates for purposes of the Collaboration; or (b) the receiving Party has learned from the disclosing Party in the course of the Collaboration, in each case including information comprising or relating to concepts, discoveries, inventions, data, designs or formulae in relation to this Agreement.

5.2 Confidential Information may be disclosed in any form (e.g., oral, written, visual, graphic, electronic or sample) by or on behalf of the disclosing Party or its Affiliates, or may be otherwise accessible to the receiving Party or its Affiliates. Exchanges of Confidential Information directly between the Affiliates are also covered by this Agreement. To the extent possible, Confidential Information will be clearly designated, labelled, marked, and/or identified as "confidential" at the time of its disclosure, or in case of oral disclosure. However, disclosed information which has not been identified by the disclosing Party as "confidential" according to the above, will nevertheless be considered Confidential Information if, given the nature of the information or the circumstances surrounding its disclosure, it should reasonably be considered as confidential.

5.3 Without the disclosing Party's prior written consent, the receiving Party will: (a) not use any part of or the whole of the Confidential Information for any purpose other than as authorized under this Agreement; (b) restrict the dissemination of Confidential Information to individuals within its own organization and disclose the Confidential Information only to those of its officers, employees and Affiliates who have a legitimate need to have access to the Confidential Information, who will be bound by confidentiality and non-use commitments no less restrictive than those of this Agreement, and who will have been made aware of the confidential nature of the Confidential Information; (c) protect the Confidential Information by using the same degree of care, but not less than a reasonable degree of care, to prevent the unauthorized use, dissemination, or publication of the Confidential Information as the receiving Party uses to protect its own confidential information of a like nature; (d) preserve the confidentiality of the Confidential Information, not disclose it to any third party, and take all necessary and reasonable precautions to prevent such information from being accessible to any third party; (e) not combine any part of or the whole of the Confidential Information with any other information; and (f) promptly notify the disclosing Party upon becoming aware of evidence or suspicion of any unauthorized use or disclosure of the Confidential Information. The foregoing obligations will exist for a period of five (5) years after disclosure of the Confidential Information.

5.4 The obligations of confidentiality and non-use listed in this Article 5 will not apply to information: (a) which is in the public domain or public knowledge at the time of disclosure, or which subsequently enters the public domain through no fault of the receiving Party; (b) which was rightfully in the possession of the receiving Party at the time of disclosure by the disclosing Party as evidenced by the receiving Party's written records; (c) which is later on independently developed by the receiving Party without use of the disclosing Party's Confidential Information; (d) which the receiving Party receives legally from any third party and which is not subject to an obligation of confidentiality to the disclosing Party; (e) the receiving Party is required to disclose pursuant to applicable law (including statute, rule, regulation, judicial action, order of the court or other governmental authority, or other legal compulsion); provided, however, that the receiving Party will make reasonable efforts, if legally permissible, to notify the disclosing Party prior to the disclosure of any part of or the whole of the Confidential Information and allow the disclosing Party the opportunity to contest and avoid such disclosure, and provided, further, that the receiving Party will disclose only that portion of such Confidential Information that it is legally required to disclose; (f) is reasonably necessary to disclose in order to file or prosecute a Patent or enforce or defend a Patent related to this Agreement; (g) is made to any third party bound by confidentiality and non-use obligations that are no less stringent than those confidentiality and non-use provisions contained in this Agreement, to the extent otherwise necessary or appropriate in connection with the exercise of receiving Party's rights or the performance of receiving Party's obligations hereunder; or (h) is necessary to disclose to the receiving Party's directors, attorneys, independent accountants or financial advisors for the sole purpose of enabling such directors, attorneys, independent accountants or financial advisors to provide advice to the receiving Party, provided, however, that in each such case on the condition that such directors, attorneys, independent accountants and financial advisors are bound by confidentiality and non-use obligations substantially consistent with those contained in this Agreement.

5.5 For the purposes of this Article 5, any combination of features disclosed to the receiving Party will not be deemed to be within the foregoing exceptions merely because individual features are within such exceptions. Moreover, specific disclosures made to the receiving Party will not be deemed to be within the foregoing exceptions merely because they are embraced by general disclosures. If the receiving Party wishes to avail itself of any of the foregoing exceptions, it will have the burden of proving that such an exception applies.

5.6 Subject to Section 5.1, all Confidential Information disclosed to the receiving Party pursuant to this Agreement will be and remain the disclosing Party's property. Nothing contained herein will be construed as granting to the receiving Party any proprietary right on or in relation to any part of or the whole of the Confidential Information, or any right to use any of the Confidential Information except for purposes of this Agreement and the Collaboration.

5.7 Receiving Party will return to disclosing Party all documents and other materials which contain Confidential Information of the disclosing Party, as well as all copies thereof, promptly upon request; provided, however, that receiving Party may keep one copy of such Confidential Information in its secure files in accordance with the terms of this Agreement for the sole purpose of maintaining a record of the Confidential Information received hereunder and for compliance with applicable laws and this Agreement.

5.8 If, in the conduct of the Collaboration, Tokalas comes into knowledge or possession of any "Protected Health Information" (as such term is defined under HIPAA) by or through MD Anderson or any information that could be used to identify any of MD Anderson's patients or research subjects, Tokalas will maintain any such Protected Health Information or other information confidential in accordance with laws and regulations as applicable to MD Anderson, including without limitation HIPAA, will use any such Protected Health Information solely as permitted by applicable law and the informed consent/authorization of the patient/research subject, and will not use or disclose any such Protected Health Information or other information in any manner that would constitute a violation of any applicable law or regulation if such use or disclosure was made by MD Anderson.

5.9 Improper use or disclosure of the Confidential Information by the receiving Party may cause substantial harm to the disclosing Party. Therefore, in the event of a breach, threatened breach, or intended breach of this Agreement by the receiving Party, in addition to any other rights and remedies available to it at law or in equity, the disclosing Party will be entitled to seek preliminary and final injunctions enjoining and restraining such breach, threatened breach, or intended breach.

6. Publication.

6.1 Notwithstanding any other provision of this Agreement, MD Anderson and its Investigators will have the right to publish or otherwise make public any Data; provided, however, that MD Anderson and/or its Investigators will submit any proposed publications containing or summarizing Data or otherwise relating to Tokalas Drug or any analogs thereof to Tokalas for review and comment at least thirty (30) days prior to submission of the proposed publication to the publishing source or other third party, and Tokalas will have thirty (30) days to provide any such comments. If with such thirty (30) day period, Tokalas objects in writing to MD Anderson to the publication due to patentable subject matter or Data contained therein, MD Anderson and its Investigators shall refrain from making such publication until the patentable subject matter contained in the proposed publication is submitted in a patent application to the United States Patent and Trademark Office and/or applicable foreign patent office(s) or Data contained therein is submitted to the FDA and/or EMA as required for regulatory approval. Tokalas representatives may be co-authors on Collaboration publications if appropriate, with inclusion and order of authors to be determined in accordance with scientific and academic custom.

7. Term and Termination.

7.1 Unless earlier terminated in accordance with this Article 7 this Agreement will be effective from the Effective Date until five (5) years following the Effective Date. Upon expiration of the five (5) year term, upon mutual written agreement, the Parties may annually extend the Collaboration and the Agreement for additional one (1) year periods.

7.2 Either Party will have the right to terminate this Agreement at any time for any or no reason upon thirty (30) days' prior written notice to the other Party. Additionally, the Parties' may immediately terminate this Agreement if the Parties mutually determine that the Collaboration has been completed prior to expiration of the term in Section 7.1. Notwithstanding the foregoing, if a Party determines that the other Party has materially breached any of its material obligations hereunder in a manner that cannot reasonably be cured, such Party will have the right to immediately terminate this Agreement upon written notice to the breaching Party.

7.3 Termination of this Agreement will terminate: (a) MD Anderson's and Tokalas' obligation to continue conduct of the Collaboration; and (b) Tokalas' obligation to pay Funding, but only to the extent that such Funding has not at the time of such termination become due and payable pursuant to Section 2.8 and Exhibit B.

7.4 Expiration or termination of this Agreement will not affect the rights and obligations of the Parties that have accrued prior to termination, and any provisions of this Agreement that by their nature extend beyond expiration or termination will survive the expiration or termination of this Agreement.

8. Notices.

8.1 Any notice or other formal communication which are required or permitted under this Agreement must be in writing and will be deemed given only if: (a) delivered in person; (b) sent by electronic facsimile communication, as evidenced by a confirmed fax transmission report; or (c) sent by internationally recognized overnight delivery service or air courier guaranteeing next day delivery. Until a change of address is communicated, as provided below, all notices and other communications must be sent to the Parties at the following addresses or facsimile numbers:

If to MD Anderson:

The University of Texas
M. D. Anderson Cancer Center
Attn: Vice President, Strategic Industry Ventures
1515 Holcombe Boulevard, Box 1643
Houston, TX 77030
Facsimile No.: (713) 792-8167

With a copy to:

The University of Texas M. D. Anderson Cancer Center
Legal Services—Unit 1674
PO Box 301407
Houston, Texas 77230-1407
Attn: Chief Legal Officer
Facsimile No.: (713) 745-6029

If to Tokalas:

Tokalas, Inc.
1737 Grand Ave.
Del Mar, CA 92014
Attn: Scott L. Glenn, President and CEO
Facsimile No.: (858) 523-5450

With a copy to:

Latham & Watkins LLP
12670 High Bluff Drive
San Diego, CA 92130
Attn: Cheston J. Larson, Esq.
Facsimile No.: (858) 523-5450

8.2 All notices will be effective and will be deemed delivered: (a) if by personal delivery, delivery service or courier, on the date of delivery; and (b) if by electronic facsimile communication, on the date of transmission of the communication. Either Party may change its notice address by sending notice of the change to the other Party in the manner set forth above.

9. Miscellaneous.

9.1 This Agreement and the rights and obligations hereunder may not be assigned, in whole or in part, by either Party without the prior written consent of the other Party.

9.2 All rights in Arising IP arising from or developed during the Collaboration will be governed by U.S. patent law. This Agreement will be governed by and construed in accordance with the laws of the State of Texas.

9.3 Except as required by law or for regulatory purposes, neither Party will use the name (including trademark or other identifier) of the other Party or such other Party's employee or staff member (except in an acknowledgment of sponsorship) in publications, advertising, press releases or for any other commercial purpose without the written approval of the other Party. Tokalas will not state or imply in any publication, advertisement, or other medium that any product or service bearing any of Tokalas' names or trademarks and/or manufactured, sold or distributed by Tokalas has been tested, approved, or endorsed by MD Anderson. Notwithstanding any other provision of this Agreement, but subject to Article 6, MD Anderson and its researchers and employees will have the right, without Tokalas' approval, to acknowledge Tokalas and Tokalas' involvement with the Collaboration in scientific or academic publications and communications describing the Collaboration or reporting the results of the Collaboration. Likewise, notwithstanding any other provision of this Agreement, Tokalas will have the right, without MD Anderson's approval, to acknowledge MD Anderson and MD Anderson's involvement with the Collaboration in scientific or academic publications and communications describing the Collaboration or reporting the results of the Collaboration.

9.4 Headings used in this Agreement are for convenience only and will not affect the interpretation.

9.5 Nonperformance by either Party will not operate as a breach of the terms of this Agreement if due to strikes or other labor disputes or to prevention or prohibition by law, the loss or damage to products in transit, Acts of God, or war or other causes beyond the reasonable control of the non-performing Party.

9.6 If any of the provisions of this Agreement will be determined to be illegal or unenforceable by arbitrators or a court of competent jurisdiction, that provision will, to the extent of its invalidity, be deemed severable and, notwithstanding this, the other provisions will remain in full force and effect.

9.7 The Parties to this Agreement are independent contractors and nothing in this Agreement will operate to create a relationship of agency, partnership or employment between the Parties and, accordingly, neither Party will have any right or authority to act on behalf of the other nor to bind the other by contract or otherwise (except as expressly permitted by the terms of this Agreement).

9.8 Any amendment to this Agreement must be in writing and signed by authorized representatives of the Parties. No waiver of any provision of this Agreement will be valid and enforceable unless it is in writing and signed by the authorized representative of the Party granting the waiver. The waiver by any Party of a breach of any of the provisions of this Agreement will not operate or be construed as a waiver of any subsequent breach by any Party or a breach of this Agreement.

9.9 This Agreement (including its Exhibits) expresses the entire agreement between the Parties in relation to the performance of the Collaboration. All prior negotiations, understandings, promises and agreements, oral or written, are superseded hereby and both Parties hereby agree that in entering into this Agreement they have not relied upon any previous understanding or representation from the other Party. Each Party further acknowledges that it has not been induced to enter into this Agreement by any representation or warranty other than those contained in this Agreement.

9.10 Notwithstanding any other provision of this Agreement, it is understood that the Parties are subject to, and will comply with, United States laws, regulations, and governmental requirements and restrictions controlling the export of technology, technical data, computer software, laboratory prototypes, and other commodities, information and items (individually and collectively, "Technology and Items"), including without limitation, the Arms Export Control Act, the Export Administration Act of 1979, relevant executive orders, and United States Treasury Department embargo and sanctions regulations, all as amended from time to time ("Restrictions") and that the Parties' obligations hereunder are contingent on compliance with applicable Restrictions. The transfer of any such Technology and Items that are subject to Restrictions may require a license or authorization from the cognizant agency of the United States Government and/or written assurances by the receiving party that it will not re-export such Technology and Items to certain foreign destinations and/or recipients without prior approval of the cognizant government agency.

9.11 Neither Party will be required to perform any act or to refrain from any act or be bound to any act that would violate any law applicable to it. In this regard, this Agreement is subject to, and the Parties agree to comply with, all applicable local, state, federal, national and international laws, statutes, rules and regulations. Any provision of any law, statute, rule or regulation that invalidates any provision of this Agreement, that is inconsistent with any provision of this Agreement, or that would cause one or any of the Parties hereto to be in violation of law will be deemed to have superseded the terms of this Agreement. The Parties, however, will use all reasonable endeavours to accommodate the terms and intent of this Agreement to the greatest extent possible consistent with the requirements of the law and negotiate in good faith toward amendment of this Agreement in such respect. If the Parties cannot reach agreement on an appropriate amendment, then this Agreement may be immediately terminated by either Party.

9.12 MD Anderson is an agency of the State of Texas and under the constitution and laws of the State of Texas possesses certain rights and privileges, is subject to certain limitations and restrictions, and only has such authority as is granted to it under the constitution and laws of the State of Texas. Notwithstanding any provision hereof, nothing in this Agreement is intended to be, nor will it be construed to be, a waiver of the sovereign immunity of the State of Texas or a prospective waiver or restriction of any of the rights, remedies, claims, and privileges of the State of Texas. Moreover, notwithstanding the generality or specificity of any provision hereof, the provisions of this agreement as they pertain to MD Anderson are enforceable only to the extent authorized by the constitution and laws of the State of Texas; accordingly, to the extent any provision hereof conflicts with the constitution or laws of the State of Texas or exceeds the right, power or authority of MD Anderson to agree to such provision, then that provision will not be enforceable against MD Anderson or the State of Texas.

ACCEPTED AND AGREED to by:

Tokalas, Inc:	**The University of Texas M. D. Anderson Cancer Center**
/s/Scott L. Glenn	/s/ Dan Fontaine
Name: Scott L. Glenn	Name: Dan Fontaine
Function: President and CEO	Function: Executive Chief of Staff

Exhibit A

Scope of Collaboration (By Stage)

1. MD Anderson will supply twenty (20) biopsies, at seventy percent (70%) estimated take rate, yielding approximately fifteen (15) viable PDXs. In addition, MD Anderson will participate in a clinical trial with Champions in the near future, and MD Anderson investigator Joseph Ludwig and colleagues at Harvard and Johns Hopkins will coordinate to test 3-4 drugs (those likely to be in clinical trials for Ewing's at one of our institutions within the next eighteen (18) months; Medi-573/mTORi or SOM230/mTORI, for example). Dr. Ludwig and the cooperative group of sarcoma experts will refer patients to whichever institution's PDX result is most likely to help the patients based upon their respective PDX readouts. The institution that leads the clinical trial for a given drug would have the sole right to publish the PDX preclinical data for that drug. MD Anderson would test Tokalas' drug TK-216. Thus, it may be possible to identify many more than fifteen to twenty (15-20) PDXs from Ewing's patients to test YK or its analog on thirty to forty (30-40).

2. Phase I: 3+3 dose escalation study in Ewing's Sarcoma: Ewing's patients seen at the MD Anderson Children's Hospital or within MD Anderson's adult sarcoma medical oncology department would be enrolled in the Phase I study. MD Anderson sees about sixty-five (65) new patients with such diagnosis per year, with about twenty (20) patients at present with advanced stage disease that could benefit from PDX testing and eventual early phase clinical trials with a drug like TK-216. Within MD Anderson, three (3) clinicians see nearly all of the Ewing's and DSRCT patients; they would carefully select patients that will almost certainly need an experimental drug like TK-216 but are early enough in their stage to survive long enough to be a candidate for TK-216. Thus, for many patients, we'd be able to correlate human clinical activity with the response from their associated PDX.

3. Phase Ib Study: two (2) step approach, consisting of: (a) fifteen (15) patients in Ewing's and ten (10) patients in AML; and (b) fifteen (15) additional patients in Ewing's and NO additional patients in AML.

4. Non-standard research studies (including pre- and post-treatment biopsies, day three (3) or (7) PET/CT's, or PDX generation from enrolling patients). These studies would be optional, would only be integrated into the Collaboration with Tokalas' agreement, and would only be performed in the expansion cohorts in Stage 3 if significant clinical activity occurs in the dose escalation phase. In concert with Dr. Ludwig's bioinformatics team, Dr. Ludwig's laboratory would be responsible for all biomarker analysis (genomic, proteomic, etc.). This data would be shared on a biweekly basis.

Exhibit B

Funding

Program Payments

Stage 1	[***]*
Stage 2	[***]**
Stage 3	[***]***
Stage 4	[***]
Payment Obligation on Successful Completion of the Collaboration	[***] of net product sales of TK-216 for Ewing's Sarcoma and AML (up to a cumulative payment of US$ 1.0M).

Notes:

* If fifteen (15) viable PDXs are not created in a reasonable amount of time, the [***] will be prorated for the appropriate level of PDXs delivered.

** [***] total to be paid to MD Anderson. If MD Anderson enrolls fewer subjects than the total number required for completion of the study, then the [***] payment will be reduced on a pro rata basis.

*** [***] to be paid to MD Anderson for each step of Stage 3 (i.e., [***]+[***]=[***]). If MD Anderson enrolls fewer subjects than the total number required for completion of the study, then the applicable [***] payment(s) will be reduced on a pro rata basis.

Exhibit 10.50

***CERTAIN MATERIAL (INDICATED BY THREE ASTERISKS IN BRACKETS) HAS BEEN OMITTED FROM THIS DOCUMENT BECAUSE IT IS BOTH (1) NOT MATERIAL AND (2) WOULD BE COMPETITIVELY HARMFUL IF PUBLICLY DISCLOSED.

AMENDMENT TO COLLABORATION AGREEMENT

This Amendment to Collaboration Agreement (the "Amendment") is dated as of January 24, 2016 (the "Amendment Effective Date") and amends that certain Collaboration Agreement between The University of Texas M.D. Anderson Cancer Center ("MD Anderson") and Tokalas, Inc. ("Tokalas") effective as of December 15, 2014 (the "Agreement"). Tokalas and MD Anderson are sometimes referred to collectively herein as the "Parties" or individually as a "Party."

Background

A. The Agreement contemplates that MD Anderson and Tokalas will collaborate on certain research and clinical trials related to Tokalas' proprietary drug, TK-216, as set forth in Exhibit A to the Agreement; and

B. The Parties have concluded that it is in the best interests of each of them to amend the Agreement as set forth herein;

C. Accordingly, the Parties are entering into this Amendment to set forth their agreement on amendments to the Agreement.

1. Exhibit B. Section 4.10 and Exhibit B to the Agreement are hereby amended to delete the [***] royalty on net product sales. If MD Anderson successfully completes the Collaboration, i.e. provides all PDXs in Stage 1 and enrolls and completes trials on all patients as outlined in Stages 2 and 3 of the Collaboration, in lieu of the royalty, MD Anderson will be paid the milestone payments set forth below. Milestone payments will be due only once. Milestone payments will be paid within thirty (30) days of achievement of the applicable milestone.

Milestone	**Milestone Payment**
[***]	[***]
[***]	[***]

In addition, Exhibit B is hereby amended to provide that [***] of the [***] payment for Stage 1 shall be paid by a grant from the Carson Sarcoma Foundation and the payment of [***] for Stage 2 shall be paid by a grant from the Slifka Foundation. The Parties will agree upon specific payment terms in connection with such grants.

3. Exhibit C. The Agreement is hereby amended to add Exhibit C attached hereto.

4. Incorporation; Conflicts; Capitalized Terms Exhibit C is incorporated hereby by reference. In the event of any conflict between the provisions of this Amendment (including Exhibit C) and the Agreement, this Amendment shall prevail. Terms capitalized, but not defined, in this Amendment or an Exhibit shall have the meaning ascribed to them in the Agreement.

5. No Other Amendment. Except as expressly set forth in this Amendment, there are no other modifications or amendments to the Agreement and the Agreement remains in full force and effect.

6. Effective and Binding. Upon execution by the Parties, this Amendment shall be effective and binding as of the Amendment Effective Date.

ACCEPTED AND AGREED TO BY:

Tokalas, Inc.

By: /s/ Lauren Otsuki

Name: Lauren Otsuki

Title: Chief Business Officer

Date: 2/3/16

The University of Texas M.D. Anderson Cancer Center

By: /s/ Jaime Farias

Name: Jaime Farias, MBA

Title: Assistant Director, Sponsored Program

Date: 2/1/16

EXHIBIT C

Additional Terms Applicable to Conduct of Clinical Trial TK 216-01

In addition to the applicable terms and conditions in the main body of the Agreement, these terms and conditions shall apply to the conduct by MD Anderson and Tokalas of any clinical trial under the Agreement. In the event of any conflict or inconsistency between the terms of this Exhibit C and the Agreement with respect to the conduct of a clinical trial, this Exhibit C shall control.

1. **Definitions.** In addition to capitalized terms defined elsewhere in this Exhibit C or in the main body of the Agreement, the following capitalized terms shall have the following meaning.

1.1 "Laws" means: (a) all applicable United States federal, state and local laws, rules, regulations, requirements, guidelines and policies that govern or apply to the conduct of a clinical trial, including, but not limited to, the Food, Drug and Cosmetic Act, as amended, applicable ICH guidelines (including the ICH guideline, E6: Good Clinical Practice: Consolidated Guideline, "Good Clinical Practices"), relevant U.S. regulations found in Title 21 of the U.S. Code of Federal Regulations ("CFR") (including Parts 11, 50, 54, 56, 312 and 314) and relevant laws and regulations regarding the privacy of health information (including the Health Insurance Portability and Accountability Act of 1996 ("HIPAA") and regulations promulgated thereunder, and any conditions of approval imposed by any applicable IRB or governmental authorities, as any of the foregoing may be amended from time to time.

1.2 "Investigators" means Joseph Ludwig and Hagop Kantarjian or a replacement for either of them, as agreed upon by the Parties.

1.3 "CRO" means Duke Clinical Research Institute (DCRI) or any replacement for DCRI. Any activities that must or may be undertaken by Tokalas hereunder may be undertaken by the CRO on behalf of Tokalas, at Tokalas's discretion.

2. **General.** The Investigators shall personally supervise and direct the clinical trial and shall be responsible for its medical, scientific and technical conduct at MD Anderson. Investigator is also responsible for: (a) the proper accounting and inventory of TK 216-01 clinical trial drug; (b) the safe handling, storage, transportation and disposal of materials involved in the clinical trial; (c) the disposition, as directed by Tokalas, of all unused or partially used TK 216-01 clinical trial drug; and (d) reporting adverse events and serious adverse events to Tokalas or its designee as directed in the TK 216-01 clinical trial protocol and other documents or instructions, and in accordance with Laws. MD Anderson and the Investigators shall perform, and shall ensure that any sub-investigators and all staff and other personnel assisting with the conduct of the clinical trial (collectively, the "Study Team") shall perform, the clinical trial in strict accordance with this Agreement and the TK 216-01 clinical trial protocol (and all accompanying instructions from Tokalas), and in compliance with Laws and all professional requirements. The Investigators shall ensure that all members of the Study Team are properly informed as to the procedures and other relevant information specified in and relating to the TK 216-01 clinical trial protocol.

3. **Informed Consent; IRB Approval.** MD Anderson and the Investigators, in consultation with Tokalas or its designee, shall create the site-specific informed consent form and authorization valid under HIPAA and FDA regulations, as applicable to the TK 216-01 clinical trial. The informed consent form and any subsequent modifications shall be subject to the approval of Tokalas and the IRB. The authorization and any modifications to it shall also be subject to the approval of Tokalas. Prior to commencing the clinical trial, MD Anderson and the Investigators shall obtain and provide to Tokalas or its designee all regulatory documentation required by the TK 216-01 clinical trial protocol and Laws, including the written approval of the IRB, a completed and signed Form FDA 1572, and completed and signed financial disclosure questionnaires. The financial disclosure questionnaires shall be updated as necessary throughout the conduct of the clinical trial and for a period of one (1) year thereafter.

4. **Case Report Forms** ("**CRFs**"); **Records.** The Investigators shall complete, maintain, and retain complete, accurate and legible CRFs for all TK 216-01 clinical trial subjects and written and electronic records and data arising from the TK 216-01 clinical trial ("Records") and shall store all Records as required by Laws and the instructions of Tokalas or its designee. No Records shall be destroyed without the advance written consent of Tokalas. CRFs and any adverse event reports shall be prepared and submitted to Tokalas or its designee as described in the TK 216-01 clinical trial protocol or otherwise directed by Tokalas. All CRFs shall be completed not later than five (5) days after a TK 216-01 clinical trial subject visit.

5. **Monitoring and FDA Audits.**

5.1 Tokalas and CRO will each have the right, with reasonable advance notice to MD Anderson, to monitor and/or audit the conduct of the clinical trial and conduct such other activities as necessary to comply with Laws by, among other activities: (a) inspection and copying, during regular administrative business hours, of any and all Records, source documents, and correspondence (including that with the IRB and FDA); (b) inspection and inventory of the TK 216-01 clinical trial drug; (c) examination of the facilities in which MD Anderson is conducting the TK 216-01 clinical trial; and (d) discussions with the Investigators and the Study Team. Tokalas or its designee shall also have the right to review each clinical trial subject's medical records for the purpose of auditing entries made on the related CRFs. All activities under this Section 5.1 shall occur with reasonable advance notice to Investigator and during normal administrative business hours.

5.2 MD Anderson shall notify Tokalas, promptly and at least within twenty-four (24) hours after such, of any regulatory inquiries, inspections, site visits (whether announced or unannounced), correspondence or communication that relates to the clinical trial, and shall consult and cooperate with Tokalas in responding to any such event. Tokalas may attend any such inspections or site visits if permitted by Laws and if feasible. To the extent permitted by Laws, MD Anderson and the Investigators shall provide Tokalas with a draft of any response any one of them generates to any inspection or any other communications from any regulatory agency relating to the clinical trial and will reasonably consider Tokalas's comments on such response.

6. **Publication.** The Investigators and MD Anderson will be permitted to independently publish or present the methods and results of the clinical trial generated by MD Anderson/Investigators, provided, however, that no such presentation or publication shall be initiated until the earlier of eighteen (18) months after: (a) the locking of the clinical trial database; or (b) completion, termination, or abandonment of the clinical trial at all clinical trial sites, unless written approval is obtained from Tokalas for earlier publication or presentation. The Investigators and MD Anderson shall provide Tokalas with a draft of any proposed presentation or publication (including information to be presented verbally) for review at least thirty (30) days in advance of the submission, presentation or publication date, whichever is earliest. The Investigators and MD Anderson shall provide Tokalas with all additional information relating to the proposed disclosure as it reasonably requests. Within such thirty (30) day period, Tokalas may require that any Tokalas Confidential Information not necessary for an acceptable professional publication be removed and/or that publication or presentation be delayed for a period of up to ninety (90) additional days for the purpose of filing patent applications.

7. **Indemnification.**

7.1 Tokalas shall indemnify, subject to the statutory duties of the Texas State Attorney General defend and hold harmless UT System, MD Anderson, Investigator, and their respective Regents, affiliates, subsidiaries, directors, officers, employees, contractors, stockholders, agents, and successors and assigns (collectively, the "MD Anderson Indemnitees") from and against any and all third-party claims, demands, actions, suits, prosecutions, and causes of action, and all resulting judgments, liabilities, penalties, damages, losses, costs and expenses (including reasonable attorney's fees and court costs) (collectively "Damages"), that are incurred by or imposed on any MD Anderson Indemnitee based upon bodily injury (including death) to a TK 216-01 clinical trial subject, which injury is sustained as a result of the proper administration of the TK 216-01 clinical trial drug in accordance with the protocol. Notwithstanding the foregoing, Tokalas shall not have any obligation to indemnify any MD Anderson Indemnitee for any Damages to the extent they arise out of: (a) the negligent or more culpable act or omission of any MD Anderson Indemnitee; or (b) any breach of any of the obligations of Investigator and/or MD Anderson under this Exhibit C or the Agreement.

7.2 To the extent authorized by the constitution and laws of the State of Texas, MD Anderson shall indemnify, defend, and hold harmless Tokalas, and its affiliates, subsidiaries, directors, officers, employees, contractors, stockholders, agents, and successors and assigns (collectively, the "Tokalas Indemnitees") from and against any and all Damages to the extent that they arise out of or are exacerbated by: (a) any negligent or more culpable act or omission of MD Anderson, Investigator, a member of the Study Team, or any of their respective employees, contractors, or agents; or (b) any breach of any of the obligations of Investigator and/or MD Anderson under this Agreement.

7.3 A person that intends to claim indemnification under Section 7.1 or 7.2 (the "Indemnitee") shall promptly notify the party from whom it seeks indemnification (the "Indemnitor") in writing of any claim, lawsuit, or other action in respect of which the Indemnitee intends to claim such indemnification. The Indemnitee shall permit the Indemnitor, at its discretion, to settle any such claim, lawsuit or other action and agrees to the complete control of such defense or settlement by the Indemnitor; provided, however, that such settlement shall not adversely affect the Indemnitee's rights hereunder or admit fault on the part of the Indemnitee without the Indemnitee's prior written consent, which consent shall not be unreasonably withheld or delayed. The Indemnitee shall cooperate fully with the Indemnitor and its legal representatives in the investigation and defense of any claim, lawsuit or other action covered by this indemnification. The Indemnitee shall have the right, but not the obligation, to be represented by counsel of its own selection and at its own expense in or with respect to any such claim, lawsuit or other action; provided however, that no such claim, lawsuit or other action shall be settled by Indemnitee without the prior written consent of the Indemnitor. This Section 7.3 shall be applicable to MD Anderson to the extent authorized by the constitution and laws of the State of Texas, and shall be subject to the statutory duties of the Texas State Attorney General.

8. **Medical Care of Study Subjects.** Subject to MD Anderson's indemnification obligations under Section 7.2, if it is determined by Tokalas that a Research Subject has suffered an injury or illness as a direct result of the proper administration of the TK 216-01 clinical trial drug in compliance with the protocol, Tokalas will provide reimbursement to MD Anderson for the reasonable and necessary costs of medical treatment reasonably required to treat such injury or illness if all of the following are true: (a) the TK 216-01 clinical trial subject followed all of the instructions provided by the Investigator and other members of the Study Team; (b) the Investigator (and sub-investigator) was in compliance with all procedures as set forth in the protocol and this Exhibit C and the Agreement; and (c) the TK 216-01 clinical trial subject's injury or illness was not a result of the negligence by the Investigator, sub-investigator(s), a Study Team member or MD Anderson. Tokalas has no obligation to provide TK 216-01 clinical trial subjects with any other money or payment for any injury or illness, including any payment for any lost wages, disability or discomfort that such subject may experience as a result of taking part in the clinical trial. In addition, Tokalas will not be responsible for paying the cost of medical care for treatment arising from the natural progression of such subject's disease or underlying conditions.

9. **Disclaimer.** EXCEPT FOR CLAIMS FOR INDEMNIFICATION OR THE GROSS NEGLIGENCE OF A PARTY, IN NO EVENT SHALL EITHER PARTY (OR THEIR RESPECTIVE AFFLIATES, SUBSIDIARIES, EMPLOYEES, OFFICERS, DIRECTORS, CONSULTANTS, OR AGENTS) BE RESPONSIBLE FOR ANY PUNITIVE DAMAGES OR CONSEQUENTIAL, INDIRECT, OR SPECIAL DAMAGES (INCLUDING BUT NOT LIMITED TO LOST PROFITS, LOSS OF OPPORTUNITY, LOSS OF USE OR LOSS OF REVENUE) OF THE OTHER PARTY ARISING FROM OR RELATED TO THIS EXHIBIT C AND THE AGREEMENT, EVEN IF INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. This Section 9 shall apply to MD Anderson to the extent authorized by the constitution and laws of the State of Texas.

10. **Relationship.** MD Anderson certifies that the Investigators are employees of MD Anderson. Should either Investigator cease to be an employee or otherwise be unwilling or unable to continue as Investigator, MD Anderson will promptly notify Tokalas and the Parties will endeavor in good faith to identify and mutually agree upon a qualified replacement that is an employee of MD Anderson and is willing and able to perform the obligations of Investigator hereunder.

11. **Insurance.** During the conduct of the clinical trial and for a period of three (3) years thereafter, Tokalas agrees to obtain and maintain, subject to reasonable deductions and retentions: (a) clinical trial liability insurance in an amount not less than $2,000,000 per occurrence and $5,000,000 annual aggregate; and (b) comprehensive general liability insurance with limits of not less than $1,000,000 per incident and annual aggregate. The insurance required shall be obtained from financially strong insurance carriers (AM Best Rating of “A VI” or higher).

Exhibit 10.51

***CERTAIN MATERIAL (INDICATED BY THREE ASTERISKS IN BRACKETS) HAS BEEN OMITTED FROM THIS DOCUMENT BECAUSE IT IS BOTH (1) NOT MATERIAL AND (2) WOULD BE COMPETITIVELY HARMFUL IF PUBLICLY DISCLOSED.

AMENDMENT 2 TO COLLABORATION AGREEMENT

This Amendment 2 to Collaboration Agreement (the "Amendment 2") is dated as of May 1, 2016 (the "Amendment Effective Date") and amends that certain Collaboration Agreement between The University of Texas M.D. Anderson Cancer Center ("MD Anderson") and Tokalas, Inc. ("Tokalas") effective as of December 15, 2014 (the "Agreement"), as amended by Amendment 1 effective as of January 24, 2016 (the "Amendment 1"). Tokalas and MD Anderson are sometimes referred to collectively herein as the "Parties" or individually as a "Party."

Background

A. The Agreement contemplates that MD Anderson and Tokalas will collaborate on certain research and clinical trials related to Tokalas' proprietary drug, TK-216, as set forth in Exhibit A to the Agreement; and

B. The Parties have concluded that it is in the best interests of each of them to amend the Agreement as set forth herein;

C. Accordingly, the Parties are entering into this Amendment to set forth their agreement on amendments to the Agreement.

1. Exhibit B. Exhibit B to the Agreement as amended is hereby deleted and replaced with Exhibit B as attached hereto.

2. Incorporation; Conflicts; Capitalized Terms. Exhibit B is incorporated hereby by reference. In the event of any conflict between the provisions of this Amendment 2 (including Exhibit B) and the Agreement and Amendment 1, this Amendment 2 shall prevail. Terms capitalized, but not defined, in this Amendment or an Exhibit shall have the meaning ascribed to them in the Agreement.

3. No Other Amendment. Except as expressly set forth in this Amendment 2, and in the Amendment 1, there are no other modifications or amendments to the Agreement and the Agreement remains in full force and effect.

4. Effective and Binding. Upon execution by the Parties, this Amendment 2 shall be effective and binding as of the Amendment Effective Date.

[*Signatures on Following Page*]

ACCEPTED AND AGREED TO BY:

TOKALAS, INC.

By: /s/ James Breitmeyer
Name: James Breitmeyer
Title: President & CEO
Date: 5/16/16

THE UNIVERSITY OF TEXAS M. D. ANDERSON CANCER CENTER

By: /s/ Chris McKee
Name: Chris McKee
Title: VP, Business Operations
Date: 5/16/16

Reviewed and Approved by UTMDACC Legal Services for UTMDACC Signature

16 May 2016 /s/

[*Signature Page to Amendment 2 to Collaboration Agreement*]

Exhibit B

Funding

Program Payments

Stage 1	[***]* *If fifteen (15) viable PDXs are not created in a reasonable amount of time, the [***] will be prorated for the appropriate level of PDXs delivered.
Stage 2-3	
Ewing's Sarcoma	[***] upfront (prior to initiation of Phase 1A)** [***] after enrollment of three (3) Phase 1A subjects [***] upon initiation of Phase 1B [***] upon completion of Phase 1B **Program Payments budgeted for Ewing's Sarcoma for five (5) Phase 1A subjects and ten (10) Phase 1B subjects (total = fifteen (15) Ewing's Sarcoma subjects). Costs for subjects enrolled beyond first fifteen (15) subjects will be paid by Tokalas in the amount of [***] per subject. If MD Anderson enrolls fewer than 15 Ewing sarcoma subjects, then the [***] payment will be reduced on a pro rata basis. MD Anderson acknowledges that Slifka Foundation may require MD Anderson to submit progress reports in conjunction with Program Payments 2-4.
AML	[***] upfront (prior to enrollment of first AML subject)*** [***] upon completion of Study with respect to AML subjects ***Program Payments budgeted for AML for ten (10) subjects. Costs for subjects enrolled beyond ten (10) subjects will be paid by Tokalas in the amount of [***] per subject. If MD Anderson enrolls fewer than 10 AML subjects, then the [***] payment will be reduced on a pro rata basis
Stage 4	Invoiced separately at cost using the rate charged by MD Anderson to its Investigators

Payment Obligation on
Successful Completion of
the Collaboration

Milestone	**Milestone Payment**
[***]	[***]
[***]	[***]

Such Milestone Payments will be paid within thirty [30] days of achievement of the applicable Milestone.

Notes:

[***] of the [***] payment for Stage 1 shall be paid by a grant from the Carson Sarcoma Foundation and [***] for Stages 2-3 combined shall be paid by a grant or directed donation from the Slifka Foundation.

Exhibit 10.52

***CERTAIN MATERIAL (INDICATED BY THREE ASTERISKS IN BRACKETS) HAS BEEN OMITTED FROM THIS DOCUMENT BECAUSE IT IS BOTH (1) NOT MATERIAL AND (2) WOULD BE COMPETITIVELY HARMFUL IF PUBLICLY DISCLOSED.

AMENDMENT 3 TO COLLABORATION AGREEMENT

This Amendment 3 to Collaboration Agreement (the "Amendment 3") is dated as of September 17, 2018 (the "Amendment 3 Effective Date") and amends that certain Collaboration Agreement between The University of Texas M.D. Anderson Cancer Center ("MD Anderson") and Oncternal Therapeutics, Inc., formerly Tokalas, Inc. ("Oncternal") effective as of December 15, 2014 (the "Agreement"), as amended by Amendment 1 effective as of January 24, 2016 (the "Amendment 1") and by Amendment 2 effective as of May 1, 2016 (the "Amendment 2"). Oncternal and MD Anderson are sometimes referred to collectively herein as the "Parties" or individually as a "Party."

Background

A. The Agreement contemplates that MD Anderson and Oncternal will collaborate on certain research and clinical trials related to Oncternal's proprietary drug, TK-216, as set forth in Exhibit A to the Agreement; and

B. The Parties have concluded that it is in the best interests of each of them to amend the Agreement as set forth herein;

C. Under Exhibit B to the Agreement, as amended by Amendment 1 and Amendment 2, the Slifka Foundation was to pay [***] for Stages 2-3 (as set forth on Exhibit A to the Agreement) combined ("Slifka Funding").

D. Slifka paid MD Anderson [***] per memo of May 13, 2016, and agreed to pay an additional [***] per memo of April 4, 2018 ("Slifka Funds Committed").

E. Slifka has declined to continue its payment of Slifka Funding beyond the Slifka Funds Committed, leaving a deficit of [***].

F. Oncternal has agreed to pay MD Anderson the aforementioned [***].

Accordingly, the Parties are entering into this Amendment 3 to set forth their agreement on amendments to the Agreement.

1. Background Section C. Background Section C of the Agreement is hereby deleted and replaced with the following:

C. MD Anderson and Oncternal wish to conduct a research collaboration involving certain research including one (1) or more clinical studies of Oncternal's proprietary drug TK-216 in Ewing's Sarcoma and AML patients (the "Collaboration").

2. Funding. As of the Amendment 3 Effective Date, Exhibit B is amended in part as attached hereto and incorporated herein by reference.

3. Incorporation; Conflicts; Capitalized Terms. In the event of any conflict between the provisions of this Amendment 3 and the Agreement, Amendment 1, and Amendment 2, this Amendment 3 shall prevail. Terms capitalized, but not defined, in this Amendment 3 or an Exhibit shall have the meaning ascribed to them in the Agreement.

4. No Other Amendment. Except as expressly set forth in this Amendment 3, and in the Amendment 1 and the Amendment 2, there are no other modifications or amendments to the Agreement and the Agreement remains in full force and effect.

5. Effective and Binding. Upon execution by the Parties, this Amendment 3 shall be effective and binding as of the Amendment 3 Effective Date.

[Signatures on Following Page]

ACCEPTED AND AGREED TO BY:

ONCTERNAL THERAPEUTICS, INC.

By: /s/ James Breitmeyer

Name: James Breitmeyer

Title: CEO

Date: 9/21/18

THE UNIVERSITY OF TEXAS M. D. ANDERSON CANCER CENTER

By: /s/ Ben Melson

Name: Ben Melson

Title: Sr. Vice President and Chief Financial Officer

Date: 9/18/18

Amended Exhibit B

Pursuant to Amendment 3 to Collaboration Agreement, as of the Amendment 3 Effective Date, Exhibit B to the Collaboration Agreement is amended in part as follows:

Funding

Program Payments

Stage 2: Stage 2 is a Phase 1 3+3 clinical study in Ewings Sarcoma. As of the Amendment 3 Effective Date, MD Anderson has enrolled and dosed 15 subjects for which it has received or will receive payment of [***] from the Slifka Foundation towards a total budget of [***] originally anticipated to be paid by the Slifka Foundation for Stage 2 and 3. In light of the Slifka Foundation's decision to discontinue funding and the costs incurred by MD Anderson to date for which it has not been reimbursed, Oncternal will make the following payments to MD Anderson:

- [***] promptly following the mutual execution of Amendment 3; and
- [***] on that date that is six months from the Amendment 3 Effective Date provided that, within thirty (30) days of the Amendment 3 Effective Date, MD Anderson has submitted all case reports forms for its 15 enrolled subjects and fully responded, to the reasonable satisfaction of Oncternal, to all data queries.

Stage 3: Stage 3 is Phase 1b clinical study in two parts. Part 1 will enroll up to fifteen (15) subjects with Ewings Sarcoma and up to ten (10) subjects with AML. For Part 1, Oncternal will reimburse MD Anderson [***] for each enrolled Ewings Sarcoma subject and [***] for each enrolled AML subject up to ten (10) subjects. For each AML subject in Part 1 in excess of ten (10) subjects, Oncternal will reimburse MD Anderson, [***] per enrolled AML subject Part 2 will enroll up to fifteen additional subjects with Ewings Sarcoma (and no AML subjects). For Part 2, Oncternal will reimburse MD Anderson [***] for each enrolled Ewings Sarcoma subject. Payment for Part 2 subjects will be made [***] upon first dosing of each subject and [***] upon each subject's completion of the study.

Exhibit 10.53

***CERTAIN MATERIAL (INDICATED BY THREE ASTERISKS IN BRACKETS) HAS BEEN OMITTED FROM THIS DOCUMENT BECAUSE IT IS BOTH (1) NOT MATERIAL AND (2) WOULD BE COMPETITIVELY HARMFUL IF PUBLICLY DISCLOSED.

RESEARCH AGREEMENT

This Agreement is made by and between Oncternal Therapeutics, Inc. ("Company") with offices at 3525 Del Mar Heights Road #821 San Diego, CA 92130-2122, and The Regents of the University of California, on behalf of its San Diego campus, having its office at 9500 Gilman Drive, La Jolla, CA 92093-0934, ("University").

WHEREAS, the parties have entered into a License Agreement for Case No. SD2005-212. Case No. SD2010-306, Case No. SD2011-178, Case No. SD2012-143. Case No. SD2012-403, and Case No. SD2015-200 dated March 31, 2016 (the "Oncternal License");

WHEREAS, it is in the mutual interest of Company and University that research be conducted on a project entitled, ROR1 Therapeutic Development Program (Research) ("Project"), UCSD Proposal Number 20164018;

WHEREAS, Company desires to financially support said research at University; NOW, THEREFORE, the parties agree as follows:

1. **SCHEDULE**. The Project shall be conducted in accordance with the statement of work attached hereto as Exhibit A and incorporated into this Agreement by this reference solely for the purpose of describing the scope of work to be performed under this Agreement. The term of this Agreement shall be July 1, 2016 through June 30, 2021, unless sooner terminated as herein provided or extended pursuant to the mutual written agreement of the parties.

2. **BUDGET**. Company shall support the Project by a grant of five million dollars ($5,000,000) ("Grant Amount"). The parties agree and acknowledge that payment by the Company of the Grant Amount shall count towards Company's obligation to provide the Research Support Funding (as defined in the Oncternal License). The Grant Amount shall cover all direct and indirect costs of the Project, as set forth in the budget attached hereto as part of Exhibit A and incorporated into this Agreement. If at any time University has reason to believe that the cost of the Project will be greater than the Grant Amount, University shall notify Company in writing to that effect, giving a revised budget of the cost of completion of the Project. Company shall not be obligated to reimburse University for the costs incurred in excess of the Grant Amount unless and until Company has notified University in writing that the revised budget is accepted , and all such excess costs reimbursed by Company thereto shall additionally count towards the Research Support Funding (as defined in the Oncternal License). Upon University's expenditure of the Grant Amount (as it may be revised hereunder), University's obligation to continue performance of the Project shall cease. The balance of any funds remaining under the Grant Amount at the end of any Project year may be carried over to subsequent years during the period of the Agreement to support the Project.

3. **PAYMENT**. Upon execution of this agreement and within 30 days of receipt of an invoice from University, Company will provide an initial partial payment of the Grant Amount in

the amount of $250,000, and within 30 days of receipt of invoices from University, nineteen (19) additional quarterly partial payments of the Grant Amount in the amount of $250,000.

Payment shall be made to "The Regents of the University of California" and sent to the following address:

The Regents of the University of California
Cashier's Office
University of California
San Diego 9500 Gilman Drive
La Jolla, CA 92093-0009

University shall forward invoices to Company at the following address:

ATTN: Oncternal Accounts Payable
E-MAIL: AP@Oncternal.com
ADDRESS: 3525 Del Mar Heights Road #821
San Diego, CA 92130-2122
PHONE: 858-434-1113
FAX: 858-408-3010

With a copy to:

ATTN: James Breitmeyer
E-MAIL: [***]
PHONE: [***]

At least thirty (30) days prior to the beginning of each quarter thereafter, University will forward an invoice to Company in an amount equal to one-quarter of the annual budget amount. Company will submit payment to the address listed above, upon receipt of such invoice.

University shall within sixty (60) days from the completion of the Project provide to Company a report of expenditures shown by major cost categories.

4. **PRINCIPAL INVESTIGATOR**. The research is to be conducted by University under the direction of Thomas Kipps, MD ("Principal Investigator") who will be responsible for the direction of the Project, including all budgeting and revisions to the Budget, in accordance with applicable University policies.

5. **CONFIDENTIALITY**. Subject to Paragraph 9 of this Agreement, it is the intent of the parties that neither party shall furnish any information considered confidential and/or proprietary by it and/or one or more third parties to the other party in connection with this Agreement.

Should Company deem it necessary to disclose information considered confidential and/or proprietary by it to University, it will be clearly marked by Company, in writing, as "Confidential Information." Except as required by law, University will use best efforts to avoid disclosure of such Confidential Information for a period of three (3) years from the date of disclosure. This

obligation does not apply to information that (i) was known to University prior to its receipt from Company without any breach of obligation of confidentiality, (ii) that is independently developed by University without any breach of obligation of confidentiality, (iii) received from any third party under no obligation to University to keep such information confidential, or (iv) is or subsequently enters the public domain through no fault of University, all as evidenced by competent written records.

6. **RIGHTS IN DATA AND DELIVERABLES**. Subject to Paragraph 5 and 8 of this Agreement, University shall have the right to copyright, publish, disclose, disseminate and use, in whole and in part, any data and information developed by University under the Project. Subject to Paragraphs 8 and 9 of this Agreement, Company shall have the right to disclose and use the technical reports, data and information delivered under the Project to Company by University for any purpose. University shall provide bi-annual interim and final written progress and summary reports to Company detailing the results of the Project. In order to effectively collaborate on the Project, University shall, at Company's reasonable request and expense (including material transfer fees), promptly provide Company with research results, reports, materials and technology as specified in Exhibit B under a subsequent separate material transfer agreement. In order to further effectively collaborate on the Project, Company shall have the opportunity to provide comment on the technical reports and bi-annual interim reports submitted by the Principal Investigator, which such comment the Principal Investigator shall consider in good faith. In addition, at the initiation of the Project and twice each year at a mutually agreed upon time and location, in conjunction with the timing of the bi-annual reports, Principal Investigator and Company shall meet for Principal Investigator to present the progress of the Project ("Progress Reports") and the plans for the upcoming period. Company shall have the opportunity to review and provide comment on the Progress Reports, which such comment the Principal Investigator shall consider in good faith. In addition, any modifications to the Project proposed by Company or Institution based on such comment to the Progress Reports shall be considered in good faith and modifications may be made to the Project as a result, provided that such Project modifications are made by mutual agreement of the Parties through an amendment in accordance with Section 22 of this Agreement.

7. **USE OF NAME/PUBLICITY**. It is agreed by each party that it will not under any circumstance use the name of the other party or its employees in any advertisement, press release or publicity with reference to this Agreement, without prior written approval of the other party.

8. **PUBLICATION**. University shall have the right to publish the results of the work conducted by University under this Agreement to the extent such results do not contain Confidential Information of Company, provided University will deliver to Company a copy of the proposed written publication at least thirty (30) days prior to submission for publication. Company shall have the opportunity to review and comment on any such publications and complete its review within such thirty (30) days prior to their submission for publication. University agrees to consider Company's comments prior to publication. However, if such proposed manuscript contains patentable information, University will, at its option, either delete the patentable information and publish immediately, or withhold publication for up to an additional sixty (60) days to allow for the filing of patent applications.

9. **PATENT RIGHTS**. Title to inventions, developments or discoveries arising from research conducted under the Research Agreement shall be determined in accordance with inventorship under United States Patent Law, Title 35 United States Code.

(a) Company Inventions. All rights to patentable inventions or discoveries conceived and reduced to practice solely by Company in the performance of the Project shall belong to Company and shall be disposed of in accordance with Company policy.

(b) University Inventions. Subject to Section 9(e) and the licenses granted by University to Company under the Oncternal License, all rights to patentable inventions or discoveries conceived and reduced to practice solely by University in the performance of the Project ("University Inventions") shall belong to University and shall be disposed of in accordance with University policy.

(c) Joint Inventions. Subject to Section 9(e) and the licenses granted by University to Company under the Oncternal License, all rights to patentable inventions or discoveries conceived and reduced to practice jointly by University and Company in the performance of the Project ("Joint Inventions") shall be jointly-owned.

(d) Know-How. The parties acknowledge and agree that all unpatentable know-how and technical information made in the performance of the Project that is directly related to ROR1 and necessary or useful to make and have made, to use and have used, to sell and have sold, to offer for sale, and to import and have imported "Licensed Products" and to practice "Licensed Methods" as defined in the Oncternal License shall be deemed "Technology" as defined in the Oncternal License.

(e) Option. To the extent that University has the legal right to do so, University shall offer to Company, in accordance with the provisions of the following paragraph, a time-limited exclusive first right to negotiate an exclusive (or non-exclusive at Company's option), worldwide, fully sub-licensable, royalty-bearing license in and under all of University's interest to any University Inventions or Joint Inventions (including all intellectual property rights thereto) to make, have made, use, sell, offer for sale, have sold and import University or Joint Inventions.

University shall promptly disclose to Company any University or Joint Inventions arising under this Research Agreement. Company shall hold such disclosure on a confidential basis and will not disclose the information to any third party without consent of University. The Company shall advise University in writing within sixty (60) days of such disclosure to Company whether or not it wishes to secure a commercial license ("Election Period"). If Company elects to secure such a license to University Inventions or Joint Inventions, Company shall reimburse University for all documented and reasonable costs incurred in connection with patent filing for such University Inventions necessary for the commercial development of such University Invention, whether or not a patent issues. University shall file patent applications on any University Invention or Joint Invention Company elects to license and for which Company agrees to pay all costs associated with patent filing and prosecution. Company shall have ninety (90) days from the date of election to conclude a license or option agreement with University ("Negotiation Period"). Such Negotiation Period may be extended by mutual agreement. Both parties agree to negotiate in good faith during such Negotiation Period. Said license shall contain reasonable terms substantially

similar to those in the Oncternal License and, if applicable shall require diligent performance by Company for the timely commercial development and early marketing of such inventions, and shall include Company's continuing obligation to pay documented and reasonable patent costs. It is understood by the parties that if such University or Joint Invention is useful or necessary for the development or commercialization of a Licensed Product (as defined in the Oncternal License) then (i) the parties shall discuss in good faith execution of an amendment to the Oncternal License rather than negotiating and entering into a separate commercial license and (ii) any such amendment to the Oncternal License or separate commercial license concluded between the parties shall not obligate Company to pay royalties or milestones in addition to those already payable under the Oncternal License. If Company elects not to secure such license(s), or such license has not been concluded within the ninety (90) day period described above, rights to the Invention(s) disclosed hereunder shall be disposed of in accordance with University policies (it being understood that each party shall continue to have its joint ownership interest in any Joint Invention and shall be free to practice any Joint Invention without the consent of, or any obligation to account to, the other party). Company may exercise its right to obtain a license with respect to any single University Invention or Joint Invention disclosed to Company pursuant to this Paragraph 9, and any failure by Company to exercise its right to obtain a license with respect to any single University Invention or Joint Invention shall not be deemed a waiver of Company's right to obtain a license with respect to any other University Invention owned by University or Joint Invention disclosed to Company hereunder.

10. **INDEMNIFICATION**. Company agrees to defend, indemnify and hold University harmless from and against any and all liability, loss, expense, reasonable attorneys' fees, or claims for injury or damages arising out of the performance of this Agreement, but only in proportion to and to the extent such liability, loss, expense, attorneys' fees, or claims for injury or damages are caused by or result from the negligent or intentional acts or omissions of Company, its officers, agents or employees.

University agrees to defend, indemnify and hold Company harmless from any claim, liability, loss, expense, reasonable attorneys' fees, or claims for injury or damages arising out of the performance of this Agreement, but only in proportion to and to the extent such liability, loss, expense, attorneys' fees, or claims for injury or damages are caused by or result from the negligent or intentional acts or omissions of University, its officers, agents, or employees.

11. **SUPPLIES AND EQUIPMENT**. In the event that University purchases equipment hereunder, title to such equipment shall vest in University.

12. **EXCUSABLE DELAYS** - In the event of a delay caused by inclement weather, fire, flood, strike or other labor dispute, act of God, act of governmental officials or agencies, or any other cause beyond the control of University, University shall be excused from performance hereunder for the period of time attributable to such delay, which may extend beyond the time lost due to one or more of the causes mentioned above. In the event of any such delay, this Agreement may be revised by changing the Budget, performance period and other provisions, as appropriate, by mutual agreement of the parties.

13. **TERMINATION** - This Agreement may be terminated by either party at any time upon the giving of sixty (60) days prior written notice to the other party. Written notice shall be

directed to the appropriate individual named in Article 15 (“CORRESPONDENCE”) of this Agreement. Upon the giving of notice of termination by Company, as of the effective termination date University shall exert its best efforts to limit or terminate any outstanding commitments. Company shall reimburse University for all costs incurred by it for all work performed through the effective termination date, and for all outstanding obligations which cannot be canceled. University shall furnish, within ninety (90) days of the effective date of termination, a final invoice for settlement of all costs to be reimbursed. Upon the giving of notice of termination by University, as of the effective termination date Company shall have no additional liability for any costs or obligations. Upon termination of the Oncternal License, this Agreement shall automatically terminate, unless the parties otherwise mutually agree in writing. Article 5 (Confidentiality), Article 6 (Rights in Data and Deliverables), Article 7 (Use of Name/Publicity), Sections 9(a)-(d), Article 18 (Failure to Perform), and Article 19 (Governing Law) shall survive termination or expiration of this agreement.

14. **COMPANY MATERIALS** - Company may deliver to University biological or other materials produced by or on behalf of Company prior to and throughout the term of this Agreement, as may be required for use in the Project. Such materials may represent significant investments of, and may be considered proprietary to, Company. University shall not use such materials provided by Company for any purpose other than conducting research pursuant to the Agreement. University shall retain exclusive control over any such materials and shall not transfer such materials, or any portion thereof, to any individual or entity not working under the Agreement without the prior written consent of Company. Any such materials provided pursuant to this Section 14 shall be described in a written notice delivered to University and referencing this Section 14.

ALL MATERIALS UNDER THIS SECTION 14 ARE PROVIDED “AS IS” AND WITHOUT ANY REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OR ANY WARRANTY THAT THE USE OF THE MATERIALS WILL NOT INFRINGE OR VIOLATE ANY PATENT OR OTHER PROPRIETARY RIGHTS OF ANY THIRD PARTY.

15. **CORRESPONDENCE** - Any notice or payment required to be given to either party under this Agreement shall be deemed to have been properly given and effective:

(a) on the date of delivery if delivered in person,

(b) five (5) days after mailing if mailed by first-class or certified mail, postage paid, to the respective addresses given below, or to such other address as is designated by written notice given to the other party, or

(c) upon confirmation by recognized national overnight courier, confirmed facsimile transmission, or confirmed electronic mail, to the following addresses or facsimile numbers of the parties.

If sent to Company:

Oncternal Therapeutics, Inc.
3525 Del Mar Heights Road #821
San Diego, CA 92130-2122
Attention: James Breitmeyer, CEO
Phone: [***]
Fax: 858-408-3010
Email: [***]

If sent to University by mail:

University of California, San Diego
Office of Contract and Grant Administration
9500 Gilman Drive, Mail Code 0934
La Jolla, California 92093-0934
Attention: Brendan Daly, JD

If sent to University by overnight delivery:

University of California, San Diego
Office of Contract and Grant Administration
10300 North Torrey Pines Road
Torrey Pines Center North, Third Floor
La Jolla, California 92037
Attention: Brendan Daly, JD

16. **ASSIGNABILITY**. This Agreement may be assigned by University, but is personal to Company and assignable by Company only with the written consent of University. Notwithstanding the foregoing, Company may assign its rights under this Agreement in whole or in part to an Affiliate or to a successor-in-interest or to substantially all of the business of Company to which this Agreement relates upon written notice to University.

17. **NO WAIVER**. No waiver by either party of any breach or default of any covenant or agreement set forth in this Agreement shall be deemed a waiver as to any subsequent and/or similar breach or default.

18. **FAILURE TO PERFORM**. In the event of a failure of performance due under this Agreement and if it becomes necessary for either party to undertake legal action against the other on account thereof, then the prevailing party shall be entitled to seek reasonable attorneys' fees in addition to costs and necessary disbursements.

19. **GOVERNING LAWS**. THIS AGREEMENT SHALL BE INTERPRETED AND CONSTRUED IN ACCORDANCE WITH THE LAWS OF THE STATE OF CALIFORNIA, but the scope and validity of any patent or patent application shall be governed by the applicable laws of the country of the patent or patent application.

20. **HEADINGS**. The headings of the several sections are inserted for convenience of reference only and are not intended to be a part of or to affect the meaning or interpretation of this Agreement.

21. **ENTIRE AGREEMENT**. This Agreement embodies the entire understanding of the parties and supersedes all previous communications, representations or understandings, either oral or written, between the parties relating to the subject matter hereof.

22. **AMENDMENTS**. No amendment or modification of this Agreement shall be valid or binding on the parties unless made in writing and signed on behalf of each party.

23. **SEVERABILITY**. In the event that any of the provisions contained in this Agreement is held to be invalid, illegal, or unenforceable in any respect, such invalidity, illegality or unenforceability shall not affect any other provisions of this Agreement, and this Agreement shall be construed as if the invalid, illegal, or unenforceable provisions had never been contained in it.

[Signature page follows]

IN WITNESS WHEREOF, both University and Company have executed this Agreement, in duplicate originals, by their respective and duly authorized officers on the day and year written.

THE REGENTS OF THE UNIVERSITY OF CALIFORNIA ON BEHALF OF ITS SAN DIEGO CAMPUS	ONCTERNAL THERAPEUTICS, INC.
By: /s/ Brendan Daly, JD (signature)	By: /s/ James Breitmeyer, Md, PhD (signature)
Name: Brendan Daly, JD	Name: James Breitmeyer, MD, PhD
Title: Principal Contract Officer	Title: President & CEO
Date: 11/3/16	Date: 11/3/16

EXHIBIT A

ROR1 Therapeutic Development Program (Research)

ONCTERNAL STATEMENT OF WORK

[***]

EXHIBIT B

UCSD DELIVERABLES TO BE PROVIDED

1. Information and data in University's possession or control that have been licensed by Oncternal under the Oncternal License as follows:

    a. Information and data for any and all other antibodies, antibody fragments, synthetic antibodies or binding moieties having binding activity for ROR1, which may include empirical data, summaries, study reports, abstracts, publications and presentations;

    b. Information and data for any and all drug conjugates involving any antibody, antibody fragment, synthetic antibody or other binding moiety having binding activity for ROR1, which may include empirical data, summaries, study reports, abstracts, publications and presentations;

    c. Information and data for any and all genetically engineered cellular therapies having an affinity for ROR-1, which may include empirical data, summaries, study reports, abstracts, publications and presentations; and

    d. Information and data A for any and all fragments of an antibody or synthetic versions thereof either used alone or fused with another functional protein to exert an effector function and having an affinity for ROR-1, which may include empirical data, summaries, study reports, abstracts, publications and presentations.

2. The following materials in the possession of University that have been licensed by Oncternal under the Oncternal License:

    e. Aliquots of antibodies, binding fragments, or cell lines that produce such antibodies or binding fragments for all precursors of cirmtuzumab including c961, 99961 and D10;

    f. Aliquots of antibodies, binding fragments, or cell lines that produce such antibodies or binding fragments for the 4A5 antibody, the humanized version of the 4A5 antibody, and all precursors to 4A5;

    g. Aliquots of other antibodies, antibody fragments, synthetic antibodies or binding moieties having binding activity for ROR1 as reasonably requested;

    h. Aliquots of drug conjugates involving any antibody, antibody fragment, synthetic antibody or other binding moiety having binding activity for ROR1 as reasonably requested;

    i. Aliquots of fragments of an antibody or synthetic versions thereof either used alone or fused with another functional protein to exert an effector function and having an affinity for ROR-1 as reasonably requested; and

j. Aliquots of research grade reagents that have already been produced and that are necessary to the testing or development of the Licensed Products (as defined in the Oncternal License) as reasonably requested.

EXECUTION VERSION

Exhibit 10.54

***CERTAIN MATERIAL (INDICATED BY THREE ASTERISKS IN BRACKETS) HAS BEEN OMITTED FROM THIS DOCUMENT BECAUSE IT IS BOTH (1) NOT MATERIAL AND (2) WOULD BE COMPETITIVELY HARMFUL IF PUBLICLY DISCLOSED.

LICENSE AND ASSIGNMENT AGREEMENT

among

Velos Biopharma Holdings, LLC

and

VelosBio Inc.

and

Oncternal Therapeutics, Inc.

Dated: February 6, 2018

TABLE OF CONTENTS

LICENSE AND ASSIGNMENT AGREEMENT

THIS LICENSE AND ASSIGNMENT AGREEMENT ("**Agreement**"), dated as of February 6, 2018 (the "**Effective Date**"), is entered into among Velos Biopharma Holdings, LLC., a Delaware limited liability company ("**LICENSOR**"), and VelosBio Inc., a Delaware corporation ("**LICENSEE**") and, solely with respect to Sections 2.3, 2.6, 2.7, 3.3, 3.4, 7.1, 16.1, 16.9, 16.15 and Articles 8 and 14, Oncternal Therapeutics, Inc., a Delaware corporation ("**Oncternal**"). Each of LICENSOR and LICENSEE, and Oncternal solely with respect to the above-referenced Sections, may be referred to herein as a "**Party**," and collectively as the "**Parties**").

RECITALS

WHEREAS, LICENSOR has acquired rights to the Licensed Technology and the Product IP (each hereinafter defined) pursuant to that certain License and Assignment Agreement by and between Oncternal and LICENSOR dated as of even date herewith (the "**Oncternal License and Assignment Agreement**") and

WHEREAS, LICENSEE desires to obtain and LICENSOR has agreed to grant, certain licenses under the Licensed Technology on the terms and conditions set forth herein.

NOW, THEREFORE, in consideration of the mutual agreements and covenants set forth herein and other good and valuable consideration, the receipt and sufficiency of which the Parties hereby acknowledge, the Parties, intending to be legally bound hereby, agree to the foregoing and as follows:

1. DEFINITIONS

1.1 "**ADC Product**" means any product containing or comprising a ROR1 reactive Antibody conjugated or fused directly or indirectly with a cytotoxic or cytostatic compound or radionuclide (or any other method of delivering a toxic moiety to a cell using an Antibody). For clarity, "ADC Product" includes, but is not limited to, any Bispecific Product conjugated, fused, or operatively linked directly or indirectly with a cytotoxic or cytostatic compound or radionuclide (or any other method of delivering a toxic moiety to a cell using an Antibody), but excludes a CAR-T Product.

1.2 "**Affiliate**" means, with respect to a Person, any other Person that controls, is controlled by, or is under common control with such first Person. For the purpose of this definition, "control" shall refer to: (a) the possession, directly or indirectly, of the power to direct the management or policies of an entity, whether through the ownership of voting securities, by contract or otherwise, or (b) the ownership, directly or indirectly, of the Ownership Threshold or more of the voting securities of such entity. Solely for purposes of this Agreement and appropriately apportioning responsibilities between the Parties, LICENSOR and Oncternal and their controlled Affiliates shall not be deemed Affiliates of LICENSEE or its controlled Affiliates and LICENSEE and its controlled Affiliates shall not be deemed an Affiliate of LICENSOR or Oncternal. The "**Ownership Threshold**" means sixty-five percent (65%) solely for purposes of Section 16.15 with respect to LICENSOR and Oncternal, and fifty percent (50%) for all other purposes hereunder.

1.3 "**Applicable Laws**" means all applicable laws, statutes, rules, regulations and guidelines, including, without limitation, but only as applicable to a given activity, all good clinical practices, good manufacturing practices and all applicable standards or guidelines promulgated by the appropriate Regulatory Authority.

1.4 "**Antibody**" means all forms of antibodies, including, but not limited to: murine, chimeric, primatized, humanized, de-immunized, and human; as well as all intact antibodies and fragments (including, but not limited to, Fab, scFv formats (including diabodies and tandem scFvs), single domain antibodies (such as nanobodies), and small modular immunopharmaceuticals (SMIPs)). For clarity, an Antibody includes any Antibody whose carbohydrates or Fc region have been chemically or genetically modified, for example, to alter its pharmacokinetics, or its interactions with immune effector cells or complement components.

1.5 "**Bispecific Product**" means any product containing or comprising a ROR1 reactive Antibody conjugated, fused, or operatively linked to any other moiety such that such product can bind simultaneously one or more epitopes on ROR1 and one or more different targets (e.g., polypeptide, carbohydrate, or lipid). For clarity, Bispecific Product does not include a CAR-T Product, but does include "multispecific" Antibodies.

1.6 "**Business Day**" means any day other than a Saturday, a Sunday or a day on which commercial banks located in New York, New York are authorized or required by law to remain closed.

1.7 "**Calendar Quarter**" means a calendar quarter, except that the first (1st) Calendar Quarter shall commence on the Effective Date and extend to the end of the then-current calendar quarter and the last calendar quarter shall extend from the first day of such calendar quarter until the effective date of the termination or expiration of this Agreement.

1.8 "**CAR-T Product**" means any product that is a genetically engineered immune effector cell expressing a ROR1 reactive Antibody or the genetic techniques to produce it, or other genetically engineered cellular therapies having an affinity for ROR1. For clarity, a CAR-T Product can also include additional Antibodies recognizing other cellular targets, or the genetic techniques to produce it, but does not include any Bispecific Product.

1.9 "**Change in Control**" means (a) the acquisition of any voting securities of a Party by any Person other than an Affiliate of such Party, immediately after which such Person has "Beneficial Ownership" (within the meaning of Rule 13d-3 promulgated under the Exchange Act) of more than fifty percent (50%) of (i) the then-outstanding shares or (ii) the combined voting power of the Party's then-outstanding voting securities, or (b) the sale to a Person other than an Affiliate of such Party of all or substantially all of the assets of such Party. Notwithstanding the foregoing, (1) a stock sale to underwriters of a public offering of a Party's capital stock or other Third Parties solely for the purpose of financing or a transaction solely to change the domicile of a Party or (2) a shift in the majority of the voting power of a Party as a resulting of a financing in which a Party issues convertible preferred shares or other securities to investors (including existing investors) in an arm's length transaction shall not constitute a Change in Control.

1.10 "**Commencement**" when used with respect to a Registration Study, means the first dosing of the first subject for such trial.

1.11 "**Commercialize**" or "**Commercialization**" means any and all activities directed to commercialization, including to manufacture for sale (along with any and all activities directed to the manufacture, receipt, incoming inspections, storage, quality control and handling of raw materials and components and the manufacture, formulation, packaging, storage, handling, assembly, production, processing, labeling, testing, disposition, packaging and quality control of any product, including manufacturing process development, scale-up and validation), market, promote, distribute, offer for sale and sell (as well as importing and exporting activities in connection therewith).

1.12 "**Commercially Reasonable Efforts**" means: (a) with respect to Development of a Product, the efforts and expenditures required to obtain Regulatory Approval that would be employed by a company in the pharmaceutical or biotechnology industry of similar size and resources to LICENSEE for a product of similar commercial potential with similar rights; and (b) with respect to Commercialization of a Product, the efforts and expenditures that would be employed by a company in the pharmaceutical or biotechnology industry of similar size and resources to LICENSEE and for a product of similar commercial potential with similar rights, in each case of (a) and (b) considering all relevant factors at the relevant time, including anticipated and actual competitiveness of the marketplace, proprietary position (e.g., patent coverage), regulatory status, supply chain, profitability (including pricing and reimbursement status achieved), relative safety and efficacy of, and other relevant factors, including technical, legal, scientific or medical factors.

1.13 "**Control**" or "**Controlled**" means, with respect to any Intellectual Property Rights, the legal authority or right (whether by ownership, license or otherwise) of a Party to grant a license or, subject to Section 2.2, a sublicense under Intellectual Property Rights, as applicable, to the other Party pursuant to the terms of this Agreement without breaching an obligation to or other arrangement with a Third Party. Notwithstanding the foregoing, upon a Change in Control of LICENSOR that results in LICENSOR being merged into a Third Party and/or all or substantially of LICENSOR's assets being assigned to a Third Party, the term Control shall be limited to only those Intellectual Property Rights that were Controlled by LICENSOR immediately prior to such Change of Control.

1.14 "**Cover**"**,** "**Covered**" or "**Covering**" means, with respect to a particular compound and a particular patent (or patent application), that, but for rights granted hereunder, the making, using or selling of such compound would infringe a Valid Claim in such patent (or patent application, as if such claim had issued).

1.15 "**Develop**" or "**Development**" means to conduct any and all research and development activities, including manufacturing process development and manufacturing for research and clinical trial purposes.

1.16 "**Dispute**" is defined in Section 14.2.

1.17 "**Dispute Resolution Period**" is defined in Section 14.2.

1.18 "**Executive Officers**" means the Chief Executive Officer of each Party.

1.19 "**Exploit**", "**Exploiting**" or "**Exploitation**" means to Develop, practice any methods, manufacture, have manufactured, market, use, import, export, Commercialize (including to offer for sale, lease, license, sell, distribute, provide technical support for and/or otherwise dispose of), in each case, directly and indirectly through multiple tiers.

1.20 "**FDA**" means the United States Food and Drug Administration, or a successor federal agency thereto.

1.21 "**Field**" means therapeutic, diagnostic and preventive applications in all indications.

1.22 "**First Commercial Sale**" means, with respect to any Product and any country, the first sale of such Product in such country by LICENSEE or its sublicensees for monetary value for use or consumption by the general public pursuant to a Regulatory Approval in such country.

1.23 "**Fully-Diluted Equity**" means all outstanding shares of capital stock of LICENSEE on an as converted to common stock basis and all options, warrants or other convertible securities, instruments, understandings, or other rights to receive or acquire capital stock (assuming the exercise or conversion in full of such options, warrants or other convertible securities, instruments or other rights, regardless of whether any such options, warrants, convertible securities or instruments or other rights are then vested or exercisable or convertible in accordance with their terms).

1.24 "**Infringing Product**" means any ADC Product or Bispecific Product that (a) contains the same active ingredient as a Product, (b) is manufactured using the same process as used to manufacture a Product, or (c) is intended to treat any indication for which such Product is being Exploited.

1.25 "**IND**" means: (a) an investigational new drug application filed with the FDA for authorization for the investigation of a Product, and (b) any of its foreign equivalents as filed with the applicable Regulatory Authorities in other countries or regulatory jurisdictions in the Territory, as applicable.

1.26 "**Intellectual Property Rights**" means all trade secrets, copyrights, patents and other patent rights, trademarks, service marks, moral rights, rights in data and any and all other intellectual property or proprietary rights (including, without limitation, applications relating thereto) in any inventions, compounds, techniques, Know-How or discoveries, whether or not patentable now known or hereafter recognized in any jurisdiction.

1.27 "**Know-How**" means any and all tangible and intangible information and materials, including research and development data, regulatory submissions and correspondence, manufacturing information and processes, formulations, assays, cell lines, sequences, composition of matter, constructs, discoveries, improvements, modifications, processes, methods, protocols, formulas, utility, data (including physical, chemical, biological, toxicological, pharmacological, preclinical, clinical, and veterinary data), results, inventions, techniques, discoveries, know-how and

trade secrets, patentable or otherwise, and all other scientific, marketing, financial and commercial information or data.

1.28 "**Licensor Know-How**" means Know-How which is owned or Controlled by LICENSOR or Oncternal or any of LICENSOR's or Oncternal's other Affiliates as of the Effective Date, including producer cell lines, master cells banks and Regulatory Filings, necessary or useful for the Exploitation of Products; provided that Licensor Know-How expressly excludes any Know-How (i) licensed to LICENSOR under the UCSD License Agreement or the Selexis Agreement or (ii) included within Product IP.

1.29 "**Licensor Patents**" means the patents and patent applications which are owned or Controlled by LICENSOR or Oncternal or any of LICENSOR's or Oncternal's other Affiliates, in each case, having claims Covering, but not exclusively Covering, the (i) Products but only to the extent such Products were existing as of the Effective Date or (ii) any inventions within the Licensor Know-How but only to the extent such inventions were existing as of the Effective Date, (b) all regular, divisional, continuation, substitution, continuation-in-part, and continued prosecution applications that claim priority to those patents or patent applications described in subsection (a); (c) all patents that have issued or in the future issue from any of the foregoing patent applications in subsections (a) or (b), including utility, model and design patents, certificates of invention and applications for certificates of invention; (d) any reissues, renewal, extensions (including patent term extensions and supplemental certificates and the like), adjustments, reexaminations, revalidations, registrations and pediatric exclusivity periods of any of the foregoing; and (e) any foreign equivalents of any of the foregoing; provided that the Licensor Patents shall expressly exclude the Platform Patents and the Product IP and any patents licensed under the Selexis Agreement. For clarity, LICENSOR represents and warrants that, as of the Effective Date, there are no Licensor Patents.

1.30 "**Licensed Technology**" means the Licensor Patents and the Licensor Know-How.

1.31 "**LICENSOR's Equity**" means (i) LICENSOR's ownership percentage of LICENSEE's total outstanding equity plus (ii) the ownership percentage of LICENSEE's total outstanding equity by any Persons that have purchased equity of LICENSEE from LICENSOR (whether purchased directly or indirectly through subsequent resale), in each case, on a Fully Diluted Basis; provided, that LICENSOR's Equity shall remain fixed at the percentage existing at the time an agreement is executed for a Change in Control of LICENSEE. For clarity, when determining LICENSOR's Equity liquidation preferences shall not be considered.

1.32 "**Major European Market Country**" means France, Germany, Great Britain, Spain and Italy.

1.33 "**Net Sales**" means the total of the gross invoice prices of Products sold or leased by LICENSEE, its Affiliates and sublicensees, or any combination thereof, less the sum of the following actual and customary deductions where applicable and separately listed: cash, trade, or quantity discounts or rebates (as allowed under applicable law); sales tax, use tax, tariff, import/export duties or other excise taxes imposed on particular sales (except for value-added and income taxes imposed on the sales of Product in foreign countries); transportation charges; or credits to

customers because of rejections, returns or recalls of Products or because of rebates or charge-backs. For purposes of calculating Net Sales, transfers to a sublicensee or an Affiliate of Product under this Agreement for (i) end use (but not resale) by the sublicensee or Affiliate shall be treated as sales by LICENSEE at list price of LICENSEE, or (ii) resale by a sublicensee or an Affiliate shall be treated as sales at the list price of the Sublicensee or Affiliate.

1.34 "**NDA**" means: (a) a new drug application filed with the FDA for authorization for marketing a Product, and (b) any of its foreign equivalents as filed with the applicable Regulatory Authorities in other countries or regulatory jurisdictions in the Territory, as applicable.

1.35 "**Person**" means an individual, corporation, partnership, limited liability company, trust, business trust, association, joint stock company, joint venture, pool, syndicate, sole proprietorship, unincorporated organization, governmental authority or any other form of entity not specifically listed herein.

1.36 "**Platform Patents**" means the Patent Rights as that term is defined in the UCSD License Agreement as of the Effective Date, including the patents and patent applications set forth in Schedule A.

1.37 "**Proceeding**" means any action, arbitration, audit, hearing, investigation, litigation or suit (whether civil, criminal, administrative, investigative or informal) commenced, brought, conducted or heard by or before, or otherwise involving any governmental entity or arbitrator.

1.38 "**Products**" means any product (i) that is an ADC Product or (ii) that is a Bispecific Product. For clarity, Products may contain a toxic payload and also be reactive with other targets in addition to ROR1. For further clarity, subject to the final sentence of Section 2.1.1, Products does not include CAR-T Products or ROR1 Antibody Products.

1.39 "**Product IP**" means (i) the patents and patents applications set forth on Schedule B (including all related file histories) and (ii) all Know–How, trademarks, service marks, good will, moral rights, and any and all other Intellectual Property Rights (including, without limitation, the right to sue for infringement, including past infringement), whether or not patentable now known or hereafter recognized in any jurisdiction owned or controlled by LICENSOR, Oncternal or any of its or their Affiliates as of the Effective Date, in each case, that is exclusively related to a Product, including the Know-How set forth on Schedule B.

1.40 "**Registration Study**" means a clinical study that would satisfy the requirements of 21 C.F.R. § 312.21(c) (or analogous statutory requirements outside of the United States).

1.41 "**Regulatory Approval**" means, with respect to a Product in any country or jurisdiction, any approval (including where required or reasonably prudent to obtain, pricing and reimbursement approvals), registration, license or authorization that is required by the applicable Regulatory Authority to market and sell such Product in such country or jurisdiction.

1.42 "**Regulatory Authority(ies)**" means, collectively, the entities in each country in

the Territory responsible for: (i) granting Regulatory Approvals for a Product in the Territory; or (ii) the establishment, maintenance and/or protection of rights related to the Licensor Patents or Platform Patents, or any other successor entities thereto.

1.43 "**Regulatory Filings**" means, with respect to a Product, any submission to a Regulatory Authority of any appropriate regulatory application, including, without limitation, any IND, NDA, any submission to a regulatory advisory board, any marketing authorization application, and any supplement or amendment thereto.

1.44 "**ROR1 Antibody Product**" means any product containing or comprising a ROR1 reactive Antibody, including, without limitation, cirmtuzumab, that is not an ADC Product or a Bispecific Product.

1.45 "**Subcontractors**" is defined in Section 2.2.3.

1.46 "**Term**" is defined in Section 12.1.

1.47 "**Territory**" means worldwide.

1.48 "**Third Party**" means any Person other than a Party or an Affiliate of a Party.

1.49 "**UCSD License Agreement**" means that certain License Agreement, dated March 31, 2016, by and between Oncternal and The Regents of the University of California.

1.50 "**Valid Claim**" means a claim of (a) an issued and unexpired patent included within the Platform Patents, the Licensor Patents or the Product IP that (i) has not been revoked, declared unenforceable or unpatentable, or held invalid by a court or other governmental agency of competent jurisdiction that is unappealable or unappealed within the time allowed for appeal, (ii) has not been admitted to be rendered invalid or unenforceable through reissue, disclaimer or otherwise, and (iii) has not been finally cancelled, withdrawn, abandoned, allowed to lapse, or rejected by any governmental agency of competent jurisdiction or (b) a pending application within the Platform Patents, the Licensor Patents or the Product IP that has been pending for no more than seven (7) years from the first priority date.

2. LICENSE GRANT; EXCLUSIVITY; ASSIGNMENT OF CERTAIN RIGHTS

2.1 License Grant.

2.1.1 **Licensed Technology**. Subject to the terms and conditions of this Agreement, LICENSOR hereby grants to LICENSEE an exclusive and sublicensable (through multiple tiers and subject to Section 2.2) right and license under the Licensed Technology to Exploit Products within the Field and within the Territory (the "**License**"). For clarity, the Parties acknowledge and agree that the License includes the right, under the Licensed Technology, to manufacture and Develop the naked ROR1 reactive Antibody solely to the extent necessary to Exploit a Product.

2.2 Sublicense Rights.

2.2.1 LICENSEE shall have the right to sublicense the rights granted under the

License in Section 2.1 to one or more of its Affiliates or Third Parties, provided that LICENSEE shall cause its Affiliates, and shall use Commercially Reasonable Efforts to cause any such Third Parties, to comply with and be bound by those terms and conditions under this Agreement that by their terms are intended to obligate a sublicensee. Notwithstanding the foregoing, LICENSEE shall remain responsible for complying with such applicable terms and conditions. A breach by any such Affiliate or Third Party sublicensee of LICENSEE of any such obligation of LICENSEE shall constitute a breach by LICENSEE of this Agreement and shall entitle LICENSOR to exercise its rights hereunder against LICENSEE, in addition to any other rights and remedies to which LICENSOR may be entitled.

2.2.2 The terms of this Section 2.2 shall apply to each subsequent sublicensee or sub-sublicensee, as if same were LICENSEE's original sublicensee.

2.2.3 LICENSEE and its sublicensees shall have the right to utilize subcontractors, including service providers, manufacturers, clinical research organizations and distributors who are performing services on LICENSEE's and/or its sublicensee's behalf ("**Subcontractors**"). Any use of such Subcontractors shall not require the consent of LICENSOR nor shall such Subcontractors be deemed sublicensees for purposes of this Agreement, including this Section 2.2; provided, that, for clarity, LICENSEE and/or its sublicensees shall have the right to grant a sublicense under the License to any such Subcontractors.

2.3 UCSD License Agreement.

2.3.1 Simultaneous with the execution of this Agreement, LICENSOR and LICENSEE agree to enter into a partial assignment and assumption of the UCSD License Agreement in the form set forth in Schedule C attached hereto (the "**Assignment**"). Thereafter, LICENSOR, or Oncternal, in conjunction with LICENSEE, will use good faith efforts to negotiate an amendment to the UCSD License Agreement (as necessary and appropriate) to address certain matters to be agreed by Oncternal and LICENSOR, collectively, and LICENSEE and UCSD including (i) that if the UCSD License Agreement is terminated for reasons other than LICENSEE's, its Affiliates' or sublicensees' fault, then LICENSEE shall retain its rights under the UCSD License Agreement and (ii) that milestones payments will be clarified such that if a Product would trigger two different sets of milestones (i.e., milestones associated with an "ADC Licensed Product" and an "Antibody Fragment or Synthetic Antibody Licensed Product" (as such terms are used in the UCSD License Agreement)) then only the higher of such milestones will be due and payable to UCSD and (iii) that LICENSEE's status as an Affiliate assignee is permitted by the UCSD License Agreement (and LICENSEE is not considered a "Third Party Sublicensee" as such term is defined in the UCSD License Agreement) and such status (for purposes of UCSD) shall be retained regardless of any changes in LICENSEE's ownership, (iv) an appropriate process to enable Oncternal and LICENSOR, collectively, and LICENSEE and UCSD to discuss and appropriately address patenting matters related to the Platform Patents, (v) the provisions set forth in Section 2.3.4 below, and (vi) that each

Party shall be released by UCSD from any breaches by the other Party of its assigned or retained portion of the UCSD License Agreement, and (v) the right to sublicense to an Affiliate without the consent of UCSD. Alternatively to negotiating such an amendment, LICENSOR or LICENSEE may request that UCSD split the UCSD License Agreement into two separate license agreements and in such case LICENSEE would handle its own independent negotiations with UCSD; provided, that Oncternal shall agree to any reasonable complementary amendment that is necessary to the UCSD License Agreement retained by Oncternal in light of such separate negotiations (e.g., a termination of the UCSD License Agreement with respect to Products, so that the Products can be directly licensed by UCSD to LICENSEE). Each Party shall have the right to provide input to the other and Oncternal with respect to any such amendments and/or splitting of the UCSD License Agreement and may join any discussions with UCSD concerning such amendments and/or splitting of the UCSD License Agreement; provided, that, such right to provide input shall terminate with respect to any Party or Oncternal, as applicable, that receives notice from UCSD that such Party or Oncternal is in breach of the UCSD License Agreement and has not cured such breach during the applicable cure period; provided, further that, in any event, LICENSOR and Oncternal, on the one hand, or LICENSEE, on the other hand, will not directly communicate with UCSD in the event that UCSD objects to such direct participation in regards to the other such entity(ies) agreement with UCSD (e.g., if UCSD objects to Oncternal participating in direct discussions regarding LICENSEE's direct license then Oncternal will not participate).

2.3.2 Subject to Section 2.3.1, LICENSOR and Oncternal shall maintain their respective rights under the UCSD License Agreement in full force and effect, without amendment, and perform their respective obligations thereunder in all material respects, except to the extent any failure to do so would not cause an adverse effect on LICENSEE's rights under this Agreement. LICENSOR shall keep LICENSEE promptly informed of any development pertaining to the UCSD License Agreement that would reasonably be expected to have an adverse effect on LICENSEE's rights under this Agreement or the UCSD License Agreement and in the event that such adverse effect could constitute a breach of the UCSD License Agreement that is uncured by Oncternal, LICENSEE shall have the right to cure such breach. In the event that LICENSEE establishes an independent agreement with UCSD or UCSD agrees or consents in writing to the Assignment contemplated hereunder then this Section 2.3.2 shall be of no further force or effect.

2.3.3 Subject to Section 2.3.1, LICENSEE shall maintain its rights under the UCSD License Agreement in full force and effect and perform its obligations thereunder in all material respects, without amendment, except to the extent any failure to do so would not cause an adverse effect on LICENSOR's rights under this Agreement or Oncternal's rights under the UCSD License Agreement. LICENSEE shall keep LICENSOR promptly informed of any development pertaining to the UCSD License Agreement that would reasonably be expected to have an adverse effect on LICENSOR's rights under this Agreement or Oncternal's rights under the

UCSD License Agreement and in the event that such adverse effect could constitute a breach of the UCSD License Agreement that is uncured by LICENSEE, LICENSOR and/or Oncternal shall have the right to cure such breach. In the event that LICENSEE establishes an independent agreement with UCSD or UCSD agrees or consents in writing to the Assignment contemplated hereunder then this Section 2.3.3 shall be of no further force or effect.

2.3.4 The Parties will use their respective commercially reasonable efforts to cause any amendment to the UCSD License Agreement, whether a single agreement or a split agreement, to have the following terms related to patents and patent applications and which terms will control, in any event, as between the Parties and their Affiliates:

(a) **Platform Patents**. Except as set forth in subsection (b) below, Oncternal has the first right but not the obligation to conduct, control and pay for the prosecution, maintenance, challenges against validity and unenforceability or patentability with respect to the Platform Patents in the Territory. At Oncternal's request, LICENSEE shall reasonably cooperate with and assist Oncternal in connection with such activities. As between the Parties, Oncternal and LICENSEE shall each bear fifty percent (50%) of the reasonable out of pockets costs of the prosecution and maintenance of the Platform Patents and LICENSEE shall within forty five (45) days reimburse Oncternal for its portion of the costs upon receipt of an undisputed and appropriately documented invoice therefor; provided, that, upon written notice from LICENSEE to Oncternal, LICENSEE may elect to stop sharing in the costs of any given Platform Patent and, if such notice is provided, then the subject Platform Patent(s) shall no longer be Platform Patents hereunder and shall be excluded from the definition of Platform Patents.

(b) **Information Rights**. Oncternal shall (i) keep LICENSEE reasonably informed as to the status of each Platform Patent in the Territory, (ii) provide LICENSEE with copies of correspondence and materials relating to the prosecution, maintenance and defense of each Platform Patent in the Territory, and consider in good faith the reasonable requests, suggestions and advice of LICENSEE with respect thereto to pass along to UCSD, including, in any event, passing along to UCSD LICENSEE's reasonable requests for any particular or additional such correspondence or materials and (iii) promptly provide LICENSEE with copies of correspondence and materials received from or filed with any Regulatory Authority within the Territory related to the Platform Patents which have been received from UCSD. The foregoing activities shall be undertaken on timing that is reasonably appropriate in light of any timing requirements that Oncternal is subject to so that LICENSEE has a meaningful opportunity to provide input and for Oncternal to consider and act on such input.

(c) **Patent Term Extension**. If election with respect to obtaining patent term extension or supplemental protection certificates or their

equivalents in any country with respect to a Product becomes available, upon Regulatory Approval or otherwise, the Parties will discuss in good faith which of the Platform Patents, if any, will be extended. Oncternal will have final decision making authority for which of the Platform Patents, if any, to extend.

(d) **Enforcement of Platform Patents**. LICENSEE shall have the first right, but not the obligation, using counsel of its choice, to enforce the Platform Patents against any actual or suspected infringement of the Platform Patents with respect to the Exploitation of an Infringing Product in the Field and Territory by a Third Party or defend any declaratory action with respect thereto brought by such Third Party (a "**Platform Patent Action**"), at its expense, and Oncternal shall provide all reasonable assistance to LICENSEE in such Platform Patent Action, including joining, at LICENSEE's reasonable expense, such Platform Patent Action if necessary to maintain the Platform Patent Action, or to seek additional or alternative damages or injunctive relief under such Platform Patent Action. Notwithstanding anything to the contrary herein, neither LICENSEE nor any of its sublicensees shall, without the prior written consent of Oncternal (which shall not be unreasonably withheld, conditioned or delayed), enter into any settlement that would: (i) adversely affect the validity, enforceability or scope of any of the Platform Patents anywhere in the world, or (ii) give rise to liability of Oncternal or its Affiliates.

(e) **Recoveries**. Any recovery received as a result of any Platform Patent Action shall be used first to reimburse the Parties for their costs and expenses (including attorneys' and professional fees) incurred in connection with such action (and not previously reimbursed), and any remaining amounts of such recovery shall be awarded to the Party that brought the suit; provided that if both Parties jointly bring a Platform Patent Action any amount recovered will be applied pro-rata (based on the agreed allocation of costs and expenses to be borne by each Party in such action or suit) for the costs and expenses with respect to such action or suit (including reasonable attorneys' fees and costs).

2.4 Retained Rights. Each Party reserves all rights with respect to all Intellectual Property Rights that are not specifically granted herein. Nothing in this Agreement shall be construed to confer any rights upon LICENSEE or LICENSOR by implication, estoppel, or otherwise as to any technology or Intellectual Property Rights of the other Party or its Affiliates other than as expressly set forth herein.

2.5 Exclusivity.

2.5.1 After the Effective Date and during the Term, neither LICENSOR nor any of its Affiliates (including Oncternal) shall Develop or Commercialize, directly or indirectly, or grant any Third Party any rights to Exploit any Product; provided, however, that the foregoing shall in no way preclude or otherwise limit LICENSOR's or any of its Affiliate's rights to perform or complete any obligations under this Agreement or any other Agreement

which may be entered into from time to time by and between LICENSOR and/or any of its Affiliates on the one hand and LICENSEE and/or its Affiliates or sublicensees on the other. The restrictions set forth in this Section 2.5.1 shall apply to an acquirer of LICENSOR pursuant to a Change in Control (and any of such acquirer's Affiliates existing prior to the date of such Change in Control), subject to Section 2.5.3.

2.5.2 After the Effective Date and during the Term, neither LICENSEE nor any of its Affiliates shall Develop or Commercialize, directly or indirectly, or grant any Third Party any rights to Exploit any ROR1 reactive Antibody which is not conjugated, fused, or operatively linked with another chemical or biological entity; provided, however, that the foregoing shall in no way preclude or otherwise limit LICENSEE's or any of its Affiliate's ability to exercise its rights and perform or complete any obligations under this Agreement, including without limitation, Sections 3.1 and 3.3 and any other activities in the Exploitation of Products that use a naked ROR1 reactive Antibody. The restrictions set forth in this Section 2.5.2 (i) shall apply to an acquirer of LICENSEE pursuant to a Change in Control (and any of such acquirer's Affiliates existing prior to the date of such Change in Control), subject to Section 2.5.3 and (ii) shall not restrict LICENSEE or any of its Affiliates or sublicensees from, directly or indirectly, using a ROR1 reactive Antibody which is not conjugated, fused, or operatively linked with another chemical or biological entity in experiments or studies to elucidate or document the difference obtained between any such Antibody and a Product or in the context of a companion diagnostic; provided neither LICENSEE nor any of its Affiliates or sublicensees shall, directly or indirectly, use a ROR1 reactive Antibody which is not conjugated, fused, or operatively linked with another chemical or biological entity in any clinical trial or other human dosing study except in the context of a companion diagnostic.

2.5.3 Notwithstanding Section 2.5.1 or 2.5.2(i) above, if the acquirer of a Party or any of such acquirer's Affiliates (collectively, but excluding such Party and its Affiliates existing immediately prior to the closing of such acquisition, the "**Acquirer**") is engaged, directly or indirectly, in any activities that, if carried out by such Party, would cause such Party to breach its exclusivity obligations set forth in Section 2.5.1 or 2.5.2(i) above (such activities, a "**Competing Program**"), then the Acquirer shall have six (6) months from the closing date of such acquisition to notify the other Party in writing that it will either (a) continue such Competing Program, provided that such Competing Program was not and is not conducted through use of any Product IP or Platform Patents or any of such other Party's Confidential Information, or (b) complete the Divesture (as defined below) of such Competing Program. The Acquirer's conduct of such Competing Program during such six (6) month period and thereafter, if applicable, shall not be deemed a breach of the acquired Party's exclusivity obligations set forth in Section 2.5.1 or 2.5.2(i), as applicable, provided that the requirements of subclause (a) above are met. The acquired Party shall provide the other Party with written notice of any such acquisition no later than thirty (30) days after the date thereof. "**Divesture**", as used in this Section 2.5.3, means the sale or transfer of rights to the Competing Program by the Acquirer to a Third Party, which may include the receipt of fees, milestones and royalties on sales of products arising from the divested Competing

Program, provided that neither the Acquirer nor any of its Affiliates engage in any management, governance or decision-making activities in connection with such Competing Program.

2.6 Oncternal License and Assignment Agreement. LICENSOR and Oncternal shall not amend or terminate the Oncternal License and Assignment Agreement without first obtaining the prior written consent of LICENSEE's chief executive officer, provided that no consent shall be required if such amendment does not directly or indirectly adversely affect LICENSEE's rights under this Agreement.

2.7 Selexis Sublicense. The Parties acknowledge and agree that Oncternal and Licensor do not have the right to sublicense the Selexis Patents and the Selexis Know-How licensed to Oncternal under that certain Commercial License Agreement between Selexis SA ("**Selexis**") and Oncternal (as successor in interest to Roar Therapeutics) dated May 19, 2014 (the "**Selexis Agreement**" and as such terms are defined therein) and the Selexis Patents and the Selexis Know-How are not "Controlled" by LICENSOR and not sublicensed under this Agreement. Notwithstanding the foregoing, LICENSOR and Oncternal agree to use reasonable efforts to assist LICENSEE in obtaining a license directly from Selexis to manufacture and use the Cell Line (as defined under the Selexis Agreement) in connection with the Products. Notwithstanding the foregoing, pursuant to the Transition Services Agreement, Oncternal has agreed to supply the UC-961 Antibody to LICENSEE for the period set forth in the Transition Services Agreement and in accordance with the terms therein. If either Oncternal or LICENSEE determines that a sublicense under the Selexis Agreement is also necessary for Oncternal to supply just the UC-961 Antibody to LICENSEE for incorporation in the Products, the Parties shall promptly negotiate and enter into a separate simple form sublicense (and consistent with the relevant terms of the Transition Services Agreement) which shall remain in place until such time as LICENSEE has its own agreement with Selexis for use of the Cell Line in connection with the Products.

3. DEVELOPMENT AND COMMERCIALIZATION; REGULATORY

3.1 Product Development. LICENSEE shall itself, or through its sublicensees, use Commercially Reasonable Efforts to Develop the Product, including each of the Products which are in development as of the Effective Date. In connection with its efforts to Develop Products, as between the Parties and subject to the performance of LICENSOR's obligations under this Agreement and the performance of Oncternal's obligations under the Asset Purchase Agreement and Transition Services Agreement, each between Oncternal and LICENSEE of even date herewith (the "**Asset Purchase Agreement**", the "**Transition Services Agreement**", and each a "**Transaction Agreement**", respectively), LICENSEE shall, as between the Parties, bear all responsibility and expense for filing Regulatory Filings and obtaining Regulatory Approval for such Products.

3.2 Product Commercialization. LICENSEE shall itself, or through its sublicensees, use Commercially Reasonable Efforts to obtain Regulatory Approval to Commercialize the Products and where Regulatory Approval to Commercialize Product is obtained by LICENSEE or its sublicensees use Commercially Reasonable Efforts to Commercialize the Products.

3.3 Companion Diagnostics. The Parties shall use Commercially Reasonable Efforts to collaborate in the development of a companion diagnostic to identify patient cancers expressing ROR1, and the Parties shall discuss in good faith how best to share any costs associated therewith (if sharing at all); provided, that, if a mutual path forward cannot be established after such good faith discussions, then each Party shall have the right to unilaterally develop a companion diagnostic; provided, that, if a Party unilaterally develops a companion diagnostic, and the other Party or any of its Affiliates subsequently desires access to such companion diagnostic, then such Party shall reimburse the developing Party for sixty percent (60%) of the documented costs that the developing Party incurred in developing such companion diagnostic (and thereafter each Party will be responsible for its own costs with respect to the use of such companion diagnostic in conjunction with its products). Notwithstanding the foregoing, Antibodies, Products or fragments thereof that are being developed by a Party as potential therapeutic agents shall not be utilized as companion diagnostics.

3.4 Right of Reference.

3.4.1 LICENSOR hereby grants LICENSEE and its sublicensees a non-exclusive right of reference with respect to any Regulatory Filings owned or Controlled by LICENSOR or Oncternal or any of their Affiliates (excluding any Affiliates which become Affiliates subsequent to a Change in Control of LICENSOR or Oncternal) during the Term for any ROR1 Antibody Product that is necessary or reasonably useful to Exploit any Product in the Field. For clarity, this right of reference includes LICENSEE's right to cross reference U.S. IND #133131.

3.4.2 LICENSEE hereby grants LICENSOR and Oncternal and their licensees a non-exclusive right of reference with respect to any Regulatory Filings owned or Controlled by LICENSEE or any of its Affiliates during the Term (excluding any Affiliates which become Affiliates subsequent to a Change in Control of LICENSEE) during the Term for any ROR1 Antibody Product that is necessary or reasonably useful to Exploit such ROR1 Antibody Product.

4. PAYMENT TERMS

4.1 Payment Terms.

4.1.1 **Milestone Payments**. LICENSEE shall notify LICENSOR as soon as practicable upon achievement of each milestone set forth in the applicable table below (each, a "**Milestone**"). In further consideration of the licenses and rights granted to LICENSEE, within sixty (60) days of achievement of each Milestone set forth in the applicable table below, LICENSEE shall pay to LICENSOR the corresponding non-creditable and non-refundable milestone payment (each, a "**Milestone Payment**").

(a) If LICENSOR's Equity is less than [***] at the time LICENSEE achieves any of the following Milestones:

MILESTONE*	MILESTONE PAYMENT
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]

*each Milestone shall only be payable once, regardless of the number of Products achieving such Milestone.

(b) If LICENSOR's Equity is [***] at the time LICENSEE achieves any of the following Milestones:

MILESTONE*	MILESTONE PAYMENT
[***]	[***]
[***]	[***]
[***]	[***]

*each Milestone shall only be payable once, regardless of the number of Products achieving such Milestone.

(c) IF LICENSOR's Equity is [***] at the time LICENSEE achieves any specific Milestone, no payments will be due resulting from such Milestone. For clarity, (i) should LICENSOR's Equity subsequently change LICENSOR shall not be entitled to the retroactive payment or retroactive increased payment of any Milestone and (ii) Milestones (1), (2) and (3) under Sections 4.1.1 (a) and (b) may only be paid under either Section 4.1.1(a) or (b), but not both.

(d) For the avoidance of doubt and notwithstanding anything to the contrary herein payment of a Milestone to LICENSOR by a sublicensee, assignee or other transferee of, or Third Party retained by, LICENSEE shall be deemed to have been satisfied by LICENSEE for purposes of this Section 4.1.1.

4.1.2 **Royalty Payments**.

(a) **Royalties**. In consideration of the licenses and rights granted to LICENSEE hereunder, LICENSEE shall pay to LICENSOR a royalty on a Product-by-Product basis equal to the Royalty Percentage set forth below of annual Net Sales of such Product in the Territory during the Royalty Term applicable to such Product (collectively, "**Royalties**"). As used herein, "Royalty Percentage" means a percentage, as determined by LICENSOR's Equity at the time of First Commercial Sale of the relevant Product, as set forth below.

LICENSOR's Equity	[***]	[***]	[***]
Royalty Percentage	[***]	[***]	[***]

(b) **Royalty Term**. The Royalties payable under this Section 4.1.2 shall be payable, subject to Section 4.1.2(f), on a Product-by-Product and country-by-country basis from the First Commercial Sale of such Product in such country until the latest of: (i) the tenth (10^{th}) anniversary of the date of such First Commercial Sale of such Product in such country or (ii) the expiration of the last Valid Claim in such country that Covers such Product (the "**Royalty Term**").

(c) **Quarterly Payments**. LICENSEE shall pay to LICENSOR the applicable Royalties within sixty (60) days following the expiration of each Calendar Quarter after the date of the First Commercial Sale. Royalties will be payable on a country-by-country, Product-by-Product, basis commencing as of the First Commercial Sale of a Product in each country until the expiration of the Royalty Term for such Product in each country.

(d) **Reports**. All payments shall be accompanied by a report that sets forth in reasonable detail (i) the Net Sales of Licensed Products for the previous Calendar Quarter, broken down by country (where available) and Product, (ii) the royalty payment that is due and payable, and (iii) the basis for calculating such royalty payment including the gross sales (where available) of Licensed Products by country (where available) and Product, the rate of currency conversion and date such conversion was calculated.

(e) **Combination Products**. In the event that a Product is Commercialized in combination (whether co-formulated, co-packaged, or administered contemporaneously or in close proximity) with one or more products which are themselves not Products under this Agreement for a single price, the Net Sales for such Product shall be calculated by multiplying the sales price of such combination sale by the fraction A/(A+B) where A is the fair market value of the Product and B is the fair market value of the other product(s) in the combination sale. If the fair market value for any product sold in combination with a Product cannot be reasonably determined, the price attributed to such product will be

based on the relative cost of goods for such product, as determined in accordance with GAAP.

(f) **Royalty Buy-Out.** Notwithstanding this Section 4.1.2, LICENSEE shall have the right and option to buy-out LICENSOR's right to receive Royalties by way of providing written notice to LICENSOR of LICENSEE's intent to exercise such buy-out right no later than six (6) months following either (A) LICENSEE's first receipt of Regulatory Approval to Commercialize a Product or (B) a Change in Control of LICENSEE (and, for clarity, either event shall trigger such option). If LICENSEE delivers such a notice: (i) the Royalty Term with respect to all Products will be deemed to have expired, and (ii) LICENSEE will pay LICENSOR a lump sum payment equal to (A) [***] if LICENSOR's Equity is [***] or (B) [***] if LICENSOR's Equity is [***] at the time that such buy-out is exercised.

4.1.3 **Other Payments**. LICENSEE shall pay to LICENSOR any other amounts due under this Agreement within sixty (60) days following receipt of an undisputed invoice.

4.1.4 **Late Payments**. In the event that any undisputed payments due hereunder are not made when due, then such payment shall accrue interest commencing on such due date until paid at the Prime Rate of Interest, as reported in the Wall Street Journal on such due date, plus [***]. The payment of such interest shall not limit or otherwise be deemed to be in satisfaction of LICENSOR exercising any other rights it may have under this Agreement arising from LICENSEE's failure to make such payment when due.

4.1.5 **After Royalty Term**. After the expiration of the Royalty Term in any relevant country for a Product, LICENSEE shall not have any further obligation under this Agreement to pay royalties to LICENSOR in such country for such Product and LICENSEE's License with respect to such Product and such country shall become perpetual, irrevocable and fully paid-up.

4.2 Payment Method.

4.2.1 Any payments that are recorded in currencies other than the US Dollar shall be converted into US Dollars at the thirty (30) day average of the daily foreign exchange rates published in the Wall Street Journal, Western Edition (or any other qualified source that is acceptable to both Parties) for the Calendar Quarter in which such payments or expenses occurred, or for periods less than a Calendar Quarter, the average of the daily rates published in the Wall Street Journal, Western Edition for such period.

4.2.2 All payments from LICENSEE to LICENSOR shall be made by wire transfer in US Dollars to the credit of such bank account as may be designated by LICENSOR in writing to LICENSEE; provided that, if any such payment or wire transfer is rendered impossible or illegal by reason of Applicable Laws in a given country, then LICENSEE shall promptly notify

LICENSOR of the conditions preventing such payment or wire transfer and the amount of such payment shall be deposited in local currency in a recognized banking institution in the relevant country in the name or to the credit of LICENSOR. Any payment which falls due on a date which is not a Business Day may be made on the next succeeding Business Day.

4.3 Taxes.

4.3.1 It is understood and agreed between the Parties that any amounts payable by LICENSEE to LICENSOR hereunder are exclusive of any and all applicable sales, use, VAT, GST, excise, property, and other taxes, levies, duties or fees (collectively, "**Taxes**"), which shall be added thereon as applicable. LICENSEE shall be responsible for billing and collection from its customers and remitting to the appropriate taxing authority any and all Taxes which it is required to collect or remit. Each Party will be responsible for their own income and property taxes. If LICENSEE is required to make a payment to LICENSOR subject to a deduction of tax or withholding tax, (i) if such withholding or deduction obligation arises as a direct result of any failure on the part of LICENSEE to comply with applicable tax laws or filing or record retention requirements, that has the effect of modifying the tax treatment of the Parties hereto (a "**LICENSEE Withholding Tax Action**"), then the sum payable by LICENSEE (in respect of which such deduction or withholding is required to be made) shall be increased to the extent necessary to ensure that LICENSOR receives a sum equal to the sum which it would have received had no such LICENSEE Withholding Tax Action occurred, or (ii) otherwise, the sum payable by LICENSEE (in respect of which such deduction or withholding is required to be made) shall be made to LICENSOR after deduction of the amount required to be so deducted or withheld, which deducted or withheld amount shall be remitted in accordance with applicable law.

4.3.2 To the extent LICENSEE is required to deduct and withhold taxes on any payments to LICENSOR, LICENSEE shall pay the amounts of such taxes to the proper Governmental Authority in a timely manner and promptly transmit to LICENSOR an official tax certificate or other evidence of such withholding sufficient to enable LICENSOR to claim such payments of taxes. LICENSOR shall provide to LICENSEE any tax forms that may be reasonably necessary in order for LICENSEE not to withhold tax or to withhold tax at a reduced rate under an applicable bilateral income tax treaty. Each Party shall provide the other with reasonable assistance to enable the recovery, as permitted by law, of withholding taxes, VAT, or similar obligations resulting from payments made under this Agreement, such recovery to be for the benefit of the Party bearing such withholding tax or VAT.

4.3.3 The Parties agree to cooperate and produce on a timely basis any tax forms or reports, including an IRS Form W-8BEN, reasonably requested by the other Party in connection with any payment made by LICENSEE to LICENSOR under this Agreement.

4.3.4 In the event that a Party undertakes any corporate action that affects the tax treatment of payments under this Agreement (e.g., reincorporation outside

of the United States, or assignment of this Agreement to an Affiliate outside of the United States), then the Party undertaking such action shall be solely responsible for the taxes accruing in connection with (including any incremental taxes that come to apply as a result of) such action.

5. RECORDS; AUDIT RIGHTS

5.1 Relevant Records.

5.1.1 **Relevant Records**. LICENSEE shall maintain accurate financial books and records pertaining to the sublicensing of the Licensed Technology pursuant to Section 2.2 and LICENSEE's sale of each Product (collectively, "**Relevant Records**"). LICENSEE shall maintain the Relevant Records for the longer of: (a) the period of time required by Applicable Law, or (b) two (2) years following expiration or termination of this Agreement.

5.1.2 **Audit Request**. LICENSOR shall have the right during the term and for twelve (12) months thereafter to engage, at its own expense, an independent auditor reasonably acceptable to LICENSEE (and which auditor has entered a confidentiality agreement with LICENSEE) to examine the Relevant Records from time-to-time, but no more frequently than once every twelve (12) months, and no more than once with respect to the same records, as may be necessary to verify the payments made by LICENSEE under this Agreement. Such audit shall be requested in writing at least seven (7) days in advance, and shall be conducted during LICENSEE's normal business hours and otherwise in manner that minimizes any interference to LICENSEE's business operations.

5.1.3 **Audit Fees and Expenses**. LICENSOR shall bear any and all fees and expenses it may incur in connection with any such audit of the Relevant Records; provided, however, in the event an audit reveals an underpayment by LICENSEE of more than ten percent (10%) as to the period subject to the audit, LICENSEE shall reimburse LICENSOR for any reasonable and documented out-of-pocket costs and expenses of the audit within sixty (60) days after receiving invoices thereof.

5.1.4 **Payment of Deficiency**. If any audit establishes that LICENSEE underpaid any amounts due to LICENSOR under this Agreement, then LICENSEE shall pay LICENSOR any such deficiency within sixty (60) days after receipt of written notice thereof unless it disputes the results of such audit in accordance with Section 14 (Dispute Resolution) of this Agreement. If any audit establishes that LICENSEE overpaid any amounts due to LICENSOR under this Agreement, then LICENSEE shall be credited any such overpayment against future Royalties and if no further Royalties are due then such amount shall be refunded to LICENSEE within sixty (60) days. For the avoidance of doubt, such payment will be considered a late payment, subject to Section 4.1.4.

6. INTELLECTUAL PROPERTY RIGHTS

6.1 Pre-existing IP. Each Party shall retain all rights, title and interests in and to any Intellectual Property Rights that are owned, licensed or sublicensed by such Party

prior to or independent of this Agreement.

6.2 Patent Prosecution. For clarity, the following Section 6.2 is only applicable to the extent there are any Licensor Patents.

(a) **Licensor Patents**. Except as set forth in subsection (b) below, LICENSOR and/or Oncternal has the first right but not the obligation to conduct, control and pay for the prosecution, maintenance, challenges against validity and unenforceability or patentability with respect to the Licensor Patents in the Territory. At LICENSOR's request, LICENSEE shall reasonably cooperate with and assist LICENSOR and/or Oncternal in connection with such activities. As between the Parties, LICENSOR and LICENSEE shall each bear fifty percent (50%) of the reasonable out of pockets costs of the prosecution and maintenance of the Licensor Patents and LICENSEE shall within forty five (45) days reimburse LICENSOR for its portion of the costs upon receipt of an undisputed and appropriately documented invoice therefor; provided, that, upon written notice from LICENSEE to LICENSOR, LICENSEE may elect to stop sharing in the costs of any given Licensor Patent and, if such notice is provided, then the subject Licensor Patent(s) shall no longer be Licensor Patents hereunder and shall be excluded from the definition of Licensor Patents.

(b) **Failure to Prosecute or Maintain Licensor Patents**. In the event that Oncternal and LICENSOR elect to forgo the prosecution or maintenance of any of the Licensor Patents, LICENSOR shall notify LICENSEE of such election at least forty-five (45) days prior to any filing or payment due date, or any other due date that requires action ("**Licensor Patent Abandonment Notice**"). Upon receipt of a Licensor Patent Abandonment Notice, LICENSEE shall have the right, but not the obligation, upon written notice to LICENSOR, at its sole discretion and expense, to have any such Licensor Patent in such country assigned to LICENSEE and LICENSOR shall, and hereby does, assign any such patents to LICENSEE (each such patent, an "**Abandoned Patent**"), and the Abandoned Patent(s) shall no longer be Licensor Patents hereunder and shall be excluded from the definition of Licensor Patents. LICENSOR hereby agrees to sign all necessary papers and do all lawful acts reasonably requisite in connection with the prosecution, assignment and enforcement of any such Abandoned Patent. Upon any such assignment of an Abandoned Patent, LICENSEE shall grant and hereby does grant to LICENSOR and its Affiliates a non-exclusive, perpetual, irrevocable, fully paid-up, royalty free, worldwide right and license under such Abandoned Patent (and any patent claiming priority to or from such patent) to practice the inventions under such Abandoned Patent and to Develop and Commercialize any products claimed by such Abandoned Patent (excluding the Products); provided, that, the foregoing license is sublicenseable solely in conjunction with LICENSOR or its Affiliates granting or assigning a Third Party rights with respect to both (i) one or more products, and (ii) intellectual property rights, in each case that are controlled

by LICENSOR or its Affiliates.

(c) **Information Rights**. LICENSOR shall (i) keep LICENSEE reasonably informed as to the status of each Licensor Patent in the Territory, (ii) provide LICENSEE with copies of correspondence and materials relating to the prosecution, maintenance and defense of each Licensor Patent in the Territory, and consider in good faith the reasonable requests, suggestions and advice of LICENSEE with respect thereto, and (iii) promptly provide LICENSEE with copies of correspondence and materials received from or filed with any Regulatory Authority within the Territory related to the Licensor Patents. The foregoing activities shall be undertaken on timing that is reasonably appropriate in light of any timing requirements that LICENSOR is subject to so that LICENSEE has a meaningful opportunity to provide input and for LICENSOR to consider and act on such input.

(d) **Patent Term Extension**. If election with respect to obtaining patent term extension or supplemental protection certificates or their equivalents in any country with respect to a Product becomes available, upon Regulatory Approval or otherwise, the Parties will discuss in good faith which of the Licensor Patents, if any, will be extended. LICENSEE will have final decision making authority for which of the Licensor Patents, if any, to extend, provided that LICENSEE shall not extend any such patent term without the prior written consent of LICENSOR (which shall not be unreasonably withheld, conditioned or delayed). Without limiting the foregoing, consent shall be deemed reasonably withheld if LICENSOR intends to apply for patent term extension with respect to such Licensor Patent for one of its or its Affiliate's or sublicensee's products.

7. INFRINGEMENT; MISAPPROPRIATION

7.1 Notification. Each Party will promptly notify the other Party in writing of any actual, suspected or threatened infringement, misappropriation or other violation by a Third Party of any Licensed Technology in the Field and in the Territory of which it becomes aware. The Parties and Oncternal shall enter into a joint interest/common defense agreement at the request of either Party (or Oncternal) prior to, or at any time following, the sharing of any such information.

7.2 Enforcement Action. For clarity, the following Section 7.2 is only applicable to the extent there are any Licensor Patents.

7.2.1 **Enforcement of Licensor Patents**. LICENSEE shall have the first right, but not the obligation, using counsel of its choice, to enforce the Licensor Patents against any actual or suspected infringement of the Licensor Patents with respect to the Exploitation of an Infringing Product in the Field and Territory by a Third Party or defend any declaratory action with respect thereto brought by such Third Party (a "**Licensor Patent Action**"), at its expense, and LICENSOR shall provide all reasonable assistance to LICENSEE in such Licensor Patent Action, including joining, at LICENSEE's reasonable expense, such Licensor Patent Action if necessary

to maintain the Licensor Patent Action, or to seek additional or alternative damages or injunctive relief under such Licensor Patent Action. Notwithstanding anything to the contrary herein, neither LICENSEE nor any of its sublicensees shall, without the prior written consent of LICENSOR (which shall not be unreasonably withheld, conditioned or delayed), enter into any settlement that would: (i) adversely affect the validity, enforceability or scope of any of the Licensor Patents anywhere in the world, or (ii) give rise to liability of LICENSOR or its Affiliates.

7.2.2 **Recoveries**. Any recovery received as a result of any Licensor Patent Action shall be used first to reimburse the Parties for their costs and expenses (including attorneys' and professional fees) incurred in connection with such action (and not previously reimbursed), and any remaining amount of such recovery shall be awarded to the Party that brought the suit; provided that if both Parties jointly bring a Licensor Patent Action any amount recovered will be applied pro-rata (based on the agreed allocation of costs and expenses to be borne by each Party in such action or suit) for the costs and expenses with respect to such action or suit (including reasonable attorneys' fees and costs) and the remaining amounts shall be awarded to LICENSEE as Net Sales and subject to the payment of Royalties (to the extent applicable) thereon.

8. CONFIDENTIALITY

8.1 Definition. "**Confidential Information**" means all types of financial, business, scientific, technical (including but not limited to information concerning ROR1 Antibody Products, the Products, biological materials, gene or protein sequences, Antibodies, antigens, cell lines, compounds, assays or test results), economic or engineering information, including without limitation, business strategies, business forecasts, product development plans, promotional and marketing objectives, results of operations, customer lists, supplier lists, patent disclosures, unpublished patent applications, know-how, trade secrets, compilations, ideas, inventions, discoveries, techniques, methods, processes, procedures, formulae, designs, patterns, drawings, schematics, plans, configurations, specifications, data sheets, mock-ups, models, compounds, compositions, structures, prototypes, clinical trial protocols, clinical data and analysis, formulae, software programs, source documents, programs, code, materials, equipment, samples, test results, opinions, data, analysis and other proprietary information, whether tangible or intangible, and whether or how stored, compiled, or memorialized physically, electronically, graphically, photographically, or in writing, which is disclosed by one Party to the other Party hereunder or obtained by a Party through observation or examination of the other Party's facilities, information and/or materials (such observation or examination hereinafter also referred to as "disclosure" for purposes of this Agreement). Notwithstanding the foregoing, all Confidential Information related exclusively to a Product shall be deemed to be LICENSEE's Confidential Information (and, for clarity, (i) Confidential Information existing as of the Effective Date exclusively relating to a Product is being assigned to LICENSEE under this Agreement and LICENSEE shall be deemed the disclosing Party and LICENSOR shall be deemed to be the receiving Party with respect thereto, and (ii) Section 8.3.1(b) shall not apply to such Confidential Information), and LICENSEE the disclosing Party, and LICENSOR the receiving Party, thereof regardless of the Party initially disclosing the same. For clarity, notwithstanding the foregoing, all

Confidential Information related exclusively to a naked ROR1 reactive Antibody disclosed by LICENSOR shall be LICENSOR's Confidential Information, and LICENSOR the disclosing Party, and LICENSEE the receiving Party, thereof.

8.2 Obligations. The receiving Party shall protect all the disclosing Party's Confidential Information against unauthorized disclosure to Third Parties with the same degree of care as the receiving Party uses for its own similar information, but in no event less than a reasonable degree of care. The receiving Party may disclose the disclosing Party's Confidential Information to its Affiliates, and their respective directors, shareholders, officers, employees, Subcontractors, sublicensees, consultants, attorneys, accountants, acquirers, merger partners, banks and investors and other potential sources of funding or evaluating an actual or potential investment or acquisition or business opportunity (collectively, "**Recipients**") who have a need-to-know such information for purposes related to this Agreement or for due diligence purposes, but only to the extent necessary to fulfill such purpose, provided that the receiving Party shall hold such Recipients to written obligations of confidentiality with terms and conditions at least as restrictive as those set forth in this Agreement. Notwithstanding the foregoing, each Party shall have the right to disclose the other Party's Confidential Information to the extent reasonably necessary under Applicable Laws in addition, LICENSEE shall have the right to disclose LICENSOR's Confidential Information as part of any Regulatory Filing for the Products and LICENSOR shall have the right to disclose LICENSEE's Confidential Information as part of any Regulatory Filing for a ROR1 Antibody Product.

8.3 Exceptions.

8.3.1 The obligations under Section 8.2 shall not apply to any information to the extent the receiving Party can demonstrate by competent evidence that such information:

(a) is (at the time of disclosure) or becomes (after the time of disclosure) known to the public or part of the public domain through no breach of this Agreement by the receiving Party or any Recipients to whom it disclosed such information;

(b) was known to, or was otherwise in the possession of, the receiving Party prior to the Term of this Agreement and was not subject to an obligation of confidentiality;

(c) is disclosed to the receiving Party on a non-confidential basis by a Third Party who is entitled to disclose it without breaching any confidentiality obligation to the disclosing Party; or

(d) is independently developed by or on behalf of the receiving Party or any of its Affiliates outside of this Agreement, as evidenced by its written records, without use of the Confidential Information.

8.3.2 The receiving Party may disclose the disclosing Party's Confidential Information if required to do so under Applicable Laws or a court order or other governmental order, provided that the receiving Party (to the extent allowed by the Applicable Law): (a) provides the disclosing Party with

prompt notice of such disclosure requirement if legally permitted, (b) affords the disclosing Party an opportunity to oppose or limit, or secure confidential treatment for such required disclosure and (c) if the disclosing Party is unsuccessful in its efforts pursuant to subsection (b), discloses only that portion of the Confidential Information that the receiving Party is legally required to disclose as advised by the receiving Party's legal counsel. In the event of a limited disclosure of the disclosing Party's Confidential Information that is required by law or regulation, the receiving Party shall continue to treat such disclosed information as the disclosing Party's Confidential Information for all other purposes and subject to the other terms and conditions of this Agreement.

8.4 **Right to Injunctive Relief**. Each Party agrees that breaches of this Article 8 may cause irreparable harm to the other Party and shall entitle such other Party, in addition to any other remedies available to it (subject to the terms of this Agreement), the right to seek injunctive relief enjoining such action without the need to post any bond.

8.5 **Ongoing Obligation for Confidentiality**. Upon termination of this Agreement, the receiving Party shall, and shall cause its Recipients to, destroy or return (as requested by the disclosing Party) any Confidential Information of the disclosing Party, except for one (1) copy which may be retained in its confidential files for archive purposes.

8.6 **Publicity Review**. Subject to this Section 8.6, the Parties shall jointly discuss and must mutually agree, based on the principles of this Section 8.6, on any statement to the public regarding this Agreement (which, for clarity, means the terms and conditions of this Agreement and not the Products themselves), subject in each case to disclosure otherwise required by Applicable Laws or the rules of any applicable securities exchange. When a Party elects to make any such statement or disclosure required under Applicable Law, it will give the other Party at least five (5) Business Days' notice to review and approve such statement, unless the applicable Regulatory Authority requires disclosure such that a Party is prohibited by Applicable Law to provide such advance review by the other Party (in which case it shall be disclosed according to such requirement and notice will be provided as soon as possible). Notwithstanding anything in this Section 8.6 to the contrary, the terms of this Agreement may be disclosed to (i) Regulatory Authorities, including the United States Securities and Exchange Commission or any other exchange or securities commission having authority over a Party, where required by and in accordance with Applicable Law with redaction of financial information not otherwise required to be disclosed under Applicable Laws, in the reasonable judgment of the Party subject to such disclosure requirement, in which event the disclosing Party shall provide in advance of submission to the other Party for review and comment a copy of such redactions made to this Agreement or (ii) bona fide potential or actual investors, advisors, collaborators, or the like, that are subject to appropriate obligations of confidentiality.

9. REPRESENTATIONS, WARRANTIES AND COVENANTS

9.1 **Representations, Warranties and Covenants by Each Party**. Each Party represents, warrants and covenants to the other Party as of the Effective Date that:

(a) it is a company duly organized, validly existing, and in good standing under the laws of its jurisdiction of formation;

(b) it has full power and authority to execute, deliver, and perform under this Agreement, and has taken all corporate action required by Applicable Law and its organizational documents to authorize the execution and delivery of this Agreement and the consummation of the transactions contemplated by this Agreement;

(c) this Agreement constitutes a valid and binding agreement enforceable against it in accordance with its terms; and

(d) all consents, approvals and authorizations from all governmental authorities or other Third Parties required to be obtained by such Party in connection with this Agreement have been obtained.

9.2 Additional Representations, Warranties and Covenants by LICENSEE.

9.2.1 the execution and delivery of this Agreement and all other instruments and documents required to be executed pursuant to this Agreement, and the consummation of the transactions contemplated hereby do not and shall not: (i) conflict with or result in a breach of any provision of its organizational documents, (ii) result in a breach of any agreement to which LICENSEE or any of its Affiliates is a party that would impair the performance of its obligations hereunder; or (iii) violate any Applicable Law.

9.2.2 LICENSEE represents and warrants to LICENSOR that it shall comply with all Applicable Law with respect to the performance of rights and its obligations hereunder.

9.3 Additional Representations, Warranties and Covenants by LICENSOR. LICENSOR, hereby represents, warrants and covenants to LICENSEE that except as set forth in the Disclosure Schedule attached hereto as Schedule E:

9.3.1 the execution and delivery of this Agreement and all other instruments and documents required to be executed pursuant to this Agreement, and the consummation of the transactions contemplated hereby do not and shall not: (i) conflict with or result in a breach of any provision of its organizational documents, (ii) result in a breach of any agreement to which LICENSOR or any of its Affiliates is a party that would impair the performance of its obligations hereunder; (iii) violate any Applicable Law; or (iv) result in the imposition of any mortgage, security interest, pledge, conditional sale or other title retention agreement, lien, charge or encumbrance on or with respect to any of the Product IP.

9.3.2 It shall comply with all Applicable Law with respect to the performance of rights and its obligations hereunder;

9.3.3 All licenses to Third Parties granted by LICENSOR or any of its Affiliates under the Licensed Technology will be consistent with LICENSEE’s rights under Article 2;

9.3.4 It has the full right, power and authority to grant all of the licenses granted to LICENSEE under this Agreement;

9.3.5 It or Oncternal is the sole and exclusive owner of all right, title and interest in and to the Licensed Technology existing as of the Effective Date and LICENSOR is the sole and exclusive owner of all right, title and interest in and to the Product IP existing as of the Effective Date and has not received any written notice of any ownership or inventorship challenge, interference, invalidity or unenforceability with respect to any patents or patent applications concerning the Product IP, Licensed Technology or Platform Patents;

9.3.6 Except for any license granted to a Third Party under the rights reserved for LICENSOR pursuant to Section 2.4, as of the Effective Date, LICENSOR has not granted to any Third Party any rights to any of the Licensed Technology, Platform Patents or Product IP in the Field with respect to which LICENSEE has been granted a license or assignment, respectively, hereunder;

9.3.7 As of the Effective Date, there is no pending Proceeding that has been commenced by or against LICENSOR or any of its Affiliates regarding the Licensed Technology, Platform Patents or Product IP. To the actual knowledge of LICENSOR following reasonable investigation no such Proceeding has been threatened;

9.3.8 As of the Effective Date, the Licensed Technology and Product IP are not subject to any liens or encumbrances;

9.3.9 To the actual knowledge of LICENSOR, the Licensed Technology and the Product IP, in conjunction with rights in the Platform Patents assigned to LICENSEE pursuant to the Asset Purchase Agreement, include all intellectual property and Know-How relating to a naked ROR1 reactive Antibody used by or on behalf of LICENSOR or its Affiliates as of the Effective Date which is necessary or useful for the Exploitation of one or more Products in the Field;

9.3.10 As of the Effective Date, neither LICENSOR nor any of its Affiliates has received any written communication and, to the actual knowledge of LICENSOR following reasonable investigation, there is no claim or action alleging that LICENSOR or its Affiliate's use of any of the Licensed Technology or Product IP or a naked ROR1 reactive Antibody infringes, or constitutes contributory infringement, inducement to infringe, misappropriation or unlawful use of, the intellectual property rights of any Person;

9.3.11 As of the Effective Date, except under the UCSD License Agreement (including the agreements with Biosite and Xoma Technology referenced therein) and except under the Commercial License Agreement between Selexis SA and Oncternal (as successor in interest to Roar Therapeutics), dated May 19, 2014, with respect to the ROR1 reactive Antibody, no royalties or milestones are due under any agreement to which LICENSOR or any of its Affiliates (including Oncternal) is a party in connection with

the Exploitation of any Product;

9.3.12 The Product IP in conjunction with the Purchased Assets (as defined under the Asset Purchase Agreement) constitute all of the assets, rights or properties (tangible and intangible) owned by LICENSOR, or its Affiliates (including Oncternal) that are exclusively related to the Exploitation of Products in the Field;

9.3.13 As of the Effective Date, there are no patents or patent applications owned or Controlled by LICENSOR or Oncternal or any of their respective Affiliates that Cover any Product other than the patents and patent applications set forth in Schedule B; and

9.3.14 As of the Effective Date, (i) the UCSD License Agreement is in effect and is valid and binding on LICENSOR and its Affiliates and enforceable in accordance with its terms, and (ii) neither LICENSOR nor any of its Affiliates is in material breach of, or material default under, the UCSD License Agreement, and no event has occurred that, with the giving of notice or lapse of time or both, would constitute a material breach or material default by LICENSOR or any of its Affiliates thereunder.

9.4 No Other Warranties. EXCEPT AS EXPRESSLY STATED IN THIS ARTICLE 9, (A) NEITHER PARTY MAKES ANY REPRESENTATIONS OR EXTENDS ANY WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, STATUTORY OR OTHERWISE, INCLUDING BUT NOT LIMITED TO WARRANTIES OF TITLE, NON-INFRINGEMENT, VALIDITY, ENFORCEABILITY, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE; AND (B) ANY INFORMATION PROVIDED BY A PARTY OR ITS AFFILIATES IS MADE AVAILABLE ON AN "AS IS" BASIS WITHOUT WARRANTY WITH RESPECT TO COMPLETENESS, OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER KIND OF WARRANTY WHETHER EXPRESS OR IMPLIED. Each Party acknowledges and agrees that any Products are experimental in nature and may have unknown characteristics.

10. INDEMNIFICATION

10.1 Indemnification by LICENSEE. LICENSEE agrees to indemnify, hold harmless and defend LICENSOR and its Affiliates, licensees and distributors and their respective officers, directors, employees, contractors, agents and permitted assigns, from and against any and all Claims arising or resulting from: (a) the Exploitation of a Product or Platform Patents by LICENSEE, its Subcontractors or sublicensees, (b) the negligence, recklessness or wrongful intentional acts or omissions or violations of Applicable Law by LICENSEE, its Affiliates, Subcontractors or sublicensees in exercising its rights or carrying out its obligations hereunder, (c) breach by LICENSEE of any representation, warranty or covenant as set forth in this Agreement, or (d) breach by LICENSEE or its assigns of any representation, warranty or covenant as set forth in the Assignment or failure to timely pay, perform or discharge any obligations under the UCSD License Agreement assumed by LICENSEE or its assigns thereunder. As used herein, "**Claims**" means collectively, any and all Third Party demands, claims and Proceedings (whether criminal or civil, in contract, tort or otherwise) for losses, damages, liabilities, costs

and expenses (including reasonable attorneys' fees).

10.2 Indemnification by LICENSOR. LICENSOR hereby agrees to indemnify, defend and hold harmless LICENSEE, Sublicensees, its Affiliates and its and their directors, officers, agents and employees from and against any and all Claims arising or resulting from: (a) the Exploitation of any ROR 1 Antibody Product or Platform Patents by or on behalf of LICENSOR, (b) the negligence, recklessness or wrongful intentional acts or omissions or violations of Applicable Law by or on behalf of LICENSOR, (c) breach by LICENSOR of any representation, warranty or covenant as set forth in this Agreement, or (d) breach by LICENSOR or its Affiliates or its or their assigns of any representation, warranty or covenant as set forth in the Assignment or failure to timely pay, perform or discharge any obligations under the UCSD License Agreement retained by Oncternal.

10.3 Indemnification Procedure. Promptly after receipt by a Party seeking indemnification under this Section 10 (an "**Indemnitee**") of notice of any pending or threatened Claim against it, such Indemnitee shall give written notice to the Party from whom the Indemnitee is entitled to seek indemnification pursuant to this Article 10 (the "**Indemnifying Party**") of the commencement thereof; provided that the failure so to notify the Indemnifying Party shall not relieve it of any liability that it may have to any Indemnitee hereunder, except to the extent the Indemnifying Party demonstrates that it is materially prejudiced thereby. The Indemnifying Party shall be entitled to participate in the defense of such Claim and, to the extent that it elects within ten (10) Business Days of its receipt of notice of the Claim from the Indemnitee, to assume control of the defense and settlement of such Claim (unless the Indemnifying Party is also a party to such proceeding and the Indemnifying Party has asserted a cross claim against the Indemnified Party or a court has otherwise determined that such joint representation would be inappropriate) with counsel reasonably satisfactory to the Indemnitee and, after notice from the Indemnifying Party to the Indemnitee of its election to assume the defense of such Claim, the Indemnifying Party shall not, as long as it diligently conducts such defense, be liable to the Indemnitee for any Litigation Costs subsequently incurred by the Indemnitee. No compromise or settlement of any Claim may be effected by the Indemnifying Party without the Indemnitee's written consent, which consent shall not be unreasonably withheld or delayed, provided no consent shall be required if (A) there is no finding or admission of any violation of Applicable Laws or any violation of the rights of any person and no effect on any other claims that may be made against the Indemnitee, (B) the sole relief provided is monetary damages that are paid in full by the Indemnifying Party, and (C) the Indemnitee's rights under this Agreement are not restricted by such compromise or settlement. Notwithstanding the foregoing, the Indemnitee shall be entitled to conduct its own defense at the cost and expense of the Indemnifying Party if the Indemnitee establishes that the conduct of its defense by the Indemnifying Party would reasonably be likely to prejudice materially the Indemnitee due to a conflict of interest between the Indemnitee and the Indemnifying Party; and *provided further* that in any event the Indemnitee may participate in such defense at its own expense.

11. LIMITATION OF LIABILITY

11.1 Consequential Damages Waiver. EXCEPT FOR (i) GROSS NEGLIGENCE OR WILLFUL MISCONDUCT, (ii) A BREACH OF ARTICLE 8 (CONFIDENTIALITY), (iii) IN CONNECTION WITH A PARTY'S

INDEMNIFICATION OBLIGATIONS UNDER SECTION 10.1 OR 10.2, OR (iv) A PARTY'S BREACH OF ITS OBLIGATIONS UNDER SECTION 2.5, AS APPLICABLE, NEITHER PARTY SHALL BE LIABLE FOR ANY INDIRECT, CONSEQUENTIAL, SPECIAL, EXEMPLARY OR PUNITIVE DAMAGES, INCLUDING DAMAGES FOR LOST PROFITS OR LOST REVENUES REGARDLESS OF WHETHER IT HAS BEEN INFORMED OF THE POSSIBILITY OR LIKELIHOOD OF SUCH DAMAGES OR THE TYPE OF CLAIM, CONTRACT OR TORT (INCLUDING NEGLIGENCE).

11.2 Liability Cap. EXCEPT FOR (A) GROSS NEGLIGENCE OR WILLFUL MISCONDUCT, (B) IN CONNECTION WITH A PARTY'S INDEMNIFICATION OBLIGATIONS UNDER SECTION 10.1 OR 10.2, (C) LICENSEE'S PAYMENT OBLIGATIONS UNDER THIS AGREEMENT, OR (D) A PARTY'S BREACH OF ITS OBLIGATIONS UNDER SECTION 2.5 OR ARTICLE 8, EACH PARTY'S TOTAL LIABILITY FOR DAMAGES IN CONNECTION WITH THIS AGREEMENT SHALL NOT EXCEED US$12,000,000, REGARDLESS OF WHETHER SUCH PARTY HAS BEEN INFORMED OF THE POSSIBILITY OR LIKELIHOOD OF SUCH DAMAGES OR THE TYPE OF CLAIM, CONTRACT OR TORT (INCLUDING NEGLIGENCE). The Parties intend that no double remedies or recoveries are intended or permitted under this Agreement and that claims asserted under one Section or subsection of this Agreement may not also be asserted under another such subsection of this Agreement or under any other Transaction Agreement if such assertion would result in double recovery.

12. TERM; TERMINATION

12.1 Term. The term of this Agreement shall commence as of the Effective Date and shall expire on a Product-by-Product and country-by-country basis, upon the date of expiration of the Royalty Term with respect to such Product and country, unless earlier terminated as set forth below (collectively, the "**Term**").

12.2 Termination for Convenience. LICENSEE shall have the right, without penalty, to terminate this Agreement in its entirety or on a Product-by-Product basis for convenience upon providing at least ninety (90) days advance written notice thereof in the event such Product has not been Commercialized (or no Product has been Commercialized in the case of termination of this Agreement in its entirety) or one hundred eighty (180) days advance written notice thereof in the event such Product has been Commercialized (or any Product has been Commercialized in the case of termination of this Agreement in its entirety).

12.3 Termination for Cause. Each Party shall have the right, without prejudice to any other remedies available to it at law or in equity, to terminate this Agreement in its entirety or on a Product-by-Product basis in the event the other Party has materially breached this Agreement and fails to cure such breach within ninety (90) days of receiving written notice thereof; provided, however, (a) if such breach relates to less than all Products, then the other Party's termination right shall only be on a Product-by-Product basis with respect to the Product(s) to which the breach relates, and (b) if such breach is capable of being cured, but cannot be cured within such ninety (90) day period, and the breaching Party initiates actions to cure such breach within such period and thereafter diligently pursues such actions, the breaching Party shall have such additional period as is reasonable to cure such breach, but in

no event will such additional period exceed an additional ninety (90) days. In the event that a Party challenges the existence of a purported material breach, and avails itself of the dispute resolution procedures set forth in Article 14, the notice period shall be tolled while such dispute resolution procedures are proceeding and this Agreement shall continue in accordance with its terms during such a period. For purposes of this Section 12.3, a "material breach" means a breach that would result in a material failure of fundamental obligations under this Agreement and for which monetary damages are an insufficient remedy.

12.4 Termination for Patent Challenge. LICENSOR shall have the right, on sixty (60) days' written notice to LICENSEE, to terminate this Agreement if LICENSEE or its Affiliates or sublicensees, individually or in association with any other person or entity (a "**Challenging Party**"), commences a legal action (except to the extent required by Applicable Law) challenging the validity or enforceability of any Licensor Patents in any court or before any governmental authority with authority to determine the validity or enforceability of a Licensor Patent ("**Patent Challenge**"). Such termination shall be effective sixty (60) days after written notice by LICENSOR to LICENSEE referencing this Section 12.4, unless the Challenging Party, within such sixty (60) days, withdraws such Patent Challenge. Notwithstanding anything to the contrary herein, Patent Challenge does not include, and termination by LICENSOR under this Section 12.4, is not permitted for any counterclaim made, filed or maintained by LICENSEE or its Affiliates or sublicensees as defendants in any patent infringement claim, demand, lawsuit, cause of action or other action made, filed or maintained by LICENSOR or Oncternal or their Affiliates and/or licensors, including where such counterclaim challenges the scope of any Licensor Patents, including without limitation any counterclaim by LICENSEE that the making, using, selling, offering for sale and importation of any Product is not within the scope of the Licensor Patents.

12.5 Termination for a Bankruptcy Event. Each Party shall have the right to terminate this Agreement in the event of a Bankruptcy Event with respect to the other Party. "**Bankruptcy Event**" means the occurrence of any of the following: (a) the institution of any bankruptcy, receivership, insolvency, reorganization or other similar proceedings by or against a Party under any bankruptcy, insolvency, or other similar law now or hereinafter in effect, including any section or chapter of the United States Bankruptcy Code, as amended or under any similar laws or statutes of the United States or any state thereof (the "**Bankruptcy Code**"), where in the case of involuntary proceedings such proceedings have not been dismissed or discharged within ninety (90) days after they are instituted, (b) the insolvency or making of an assignment for the benefit of creditors or the admittance by a Party of any involuntary debts as they mature, (c) the institution of any reorganization, arrangement or other readjustment of debt plan of a Party not involving the Bankruptcy Code, (d) appointment of a receiver for all or substantially all of a Party's assets, or (e) any corporate action taken by the board of directors of a Party in furtherance of any of the foregoing actions.

12.6 Effect of Termination or Expiration.

12.6.1 Upon the natural expiration of this Agreement, LICENSOR hereby grants to LICENSEE a royalty-free, fully paid-up right, perpetual, irrevocable and exclusive license, with the right to sublicense through multiple tiers, to use the Licensor Know-How for the purpose of the Exploitation of the Products

in the Field within the Territory.

12.6.2 Upon termination of this Agreement (provided if termination is solely with respect to a Product, the following shall be read to be solely with respect to such Product):

(a) LICENSEE shall have the right to sell its remaining inventory of Product for a period of one hundred eighty (180) days following the termination of this Agreement so long as LICENSEE is able to do so in compliance with Applicable Laws, and LICENSEE otherwise is not in material breach of this Agreement.

(b) Subject to Section 12.6.2(a), all licenses granted hereunder shall terminate, provided that, any sublicenses granted by LICENSEE to a Third Party (including further sublicenses such direct sublicensees may have granted) shall survive at the request of the direct sublicensee; provided further that each direct sublicensee is then in material compliance with its sublicense agreement and promptly agrees in writing to be bound by the applicable terms of this Agreement (including, to the extent applicable, agreeing to pay amounts due hereunder).

12.7 Remedies. All of the non-breaching/terminating Party's remedies shall be cumulative, and the exercise of one remedy hereunder by the non-defaulting/terminating Party shall not be deemed to be an election of remedies. These remedies shall include the non-breaching/terminating Party's other rights of recovery for such breach with or without terminating this Agreement.

12.8 Survival. Expiration or termination of this Agreement shall not relieve the Parties of any obligation accruing hereunder prior to such expiration or termination. Without limiting the foregoing, the provisions of Articles 1 (to the extent necessary to give effect to other surviving provision), 4 and 5 (with respect to amounts due prior to such expiration or termination), 8, 10, 11, 14, 15, and 16, and Sections 6.1, 12.6 (as applicable), 12.7, this 12.8, and 13.1 (for the period set forth therein) shall survive expiration or termination of this Agreement.

13. LICENSEE INSURANCE

13.1 Insurance Requirements. Prior to the Commencement of any Phase I Clinical Trial for a Product or otherwise Commercializing the Product, LICENSEE shall, at its sole cost and expense, obtain and keep in force during the Term and for a period of not less than (a) three (3) years after termination or expiration of this Agreement, or (b) the date that all statutes of limitation covering claims or suits that may be instituted for personal injury based on the sale or use of the Products have expired, commercial general liability insurance from a minimum "A-" AM Bests rated insurance company, including contractual liability and product liability or clinical trials, if applicable, with coverage limits of not less than five million dollars (US $5,000,000) per occurrence and five million dollars (US $5,000,000) in the aggregate. LICENSEE has the right to provide the total limits required by any combination of primary and umbrella/excess coverage. The minimum level of insurance set forth herein shall not be construed to create a limit on LICENSEE's liability hereunder. Such policies shall name LICENSOR and its Affiliates as

additional insured.

13.2 Policy Notification. LICENSEE shall provide LICENSOR with a certificate of insurance signed by an authorized representative of LICENSEE's insurance underwriter evidencing the insurance coverage required by this Agreement: (a) prior to Commencement of the first Phase I Clinical Trial for a Product, (b) thirty (30) days prior to expiration, termination, or reduction of such insurance coverage, and (C) upon LICENSOR's request not more than once annually.

13.3 Third Parties. LICENSEE shall use Commercially Reasonable Efforts to cause Third Parties engaged by LICENSEE to perform LICENSEE's obligations under this Agreement to maintain such types of insurance coverages and for such period of time as are customary for such Third Parties given the nature of the services to be provided.

14. DISPUTE RESOLUTION

14.1 General. Except for disputes for which injunctive or other equitable relief is sought to prevent the unauthorized use or disclosure of proprietary materials or information, prevent the infringement or misappropriation of a Party's Intellectual Property Rights or prevent a breach of Section 2.5, the following procedures shall be used to resolve any dispute arising out of or in connection with this Agreement.

14.2 Meeting. Promptly after the written request of either Party, each of the Parties shall appoint a designated representative to meet in person or by telephone to attempt in good faith to resolve any dispute arising out of or resulting from this Agreement ("**Dispute**"). If such designated representatives do not resolve such Dispute within sixty (60) Business Days of such written request, then the Executive Officer of each Party shall meet in person or by telephone to review and attempt to resolve such Dispute in good faith. The Executive Officers shall have sixty (60) Business Days to attempt to resolve the dispute (such total one hundred and twenty (120) Business Days the "**Dispute Resolution Period**"). If the Parties are unable to resolve a Dispute within a Dispute Resolution Period, then such Dispute shall be resolved in accordance with Section 14.3.

14.3 Arbitration.

14.3.1 Any Disputes that are not resolved by the Parties in accordance with Section 14.2 shall be submitted to binding arbitration with the office of the American Arbitration Association ("**AAA**") in San Diego County, California in accordance with the then-prevailing commercial arbitration rules of the American Arbitration Association. Such Dispute shall be heard by a panel of three (3) arbitrators appointed in accordance with such rules.

14.3.2 All such arbitration proceedings shall be held in English and a transcribed record shall be prepared in English. The Party submitting the Dispute to arbitration shall select the first of the three (3) arbitrators and shall provide notice of the same at the time it submits the Dispute to arbitration. The non-initiating Party shall then have thirty (30) days to select the second arbitrator. Thereafter, the first and second arbitrators shall have thirty (30) days to choose the third arbitrator. If no arbitrator is appointed within the times herein provided or any extension of time which is mutually agreed

upon, the AAA shall make such appointment of the first two (2) arbitrators within thirty (30) days of such failure who shall thereafter pick the third as set forth herein. Each Party in any arbitration proceeding commenced hereunder shall initially bear such Party's own costs and expenses (including expert witness and attorneys' fees) of investigating, preparing and pursuing such arbitration claim. The fees and expenses of the arbitrators, will be shared equally by the Parties. Nothing in this Agreement shall be deemed as preventing either Party from seeking injunctive relief (or any other provisional remedy) from any court having jurisdiction over the Parties and the subject matter of the Dispute as necessary to protect either Party's name, Confidential Information, Intellectual Property or any other proprietary rights or to prevent a breach of Section 2.5. If the Dispute involves scientific or technical matters, each arbitrator chosen hereunder shall have educational training and experience relevant to the field of biotechnology. The award rendered by the arbitrators shall be written, final and non-appealable, and judgment upon the award rendered by the arbitrator may be entered in any court having jurisdiction thereof. The prevailing Party shall be entitled to recover from the losing Party the prevailing Party's attorneys' fees and costs. The arbitrator shall have the right to apportion liability between the Parties, but will not have the authority to award any damages or remedies not available under the express terms of this Agreement. The arbitration award will be presented to the Parties in writing, and upon the request of either Party, will include findings of fact and conclusions of law. The award may be confirmed and enforced in any court of competent jurisdiction.

15. PRODUCT IP ASSIGNMENT

15.1 **Transfer of Product IP**. LICENSOR hereby sells, assigns, transfers and conveys to LICENSEE, and LICENSEE hereby purchases, all of LICENSOR's right, title and interest in and to the Product IP, free and clear of any Liens. Simultaneous with the execution of this Agreement, the Parties shall execute the bill of sale and assignment and assumption attached hereto as Schedule D in connection with the transfer and assignment of the Product IP.

16. GENERAL PROVISIONS

16.1 **Assignment**. Neither Party may assign its rights and obligations under this Agreement without the other Party's prior written consent, except that: (a) each Party may assign its rights and obligations under this Agreement or any part hereof to one or more of its Affiliates without the consent of the other Party; and (b) either Party may assign this Agreement in the event of a Change in Control. The assigning Party shall provide the other Party with prompt written notice of any such assignment. Any permitted assignee pursuant to clauses (a) and (b) above shall assume all obligations of its assignor under this Agreement, and no permitted assignment shall relieve the assignor of liability for its obligations hereunder. In addition, each of LICENSOR and Oncternal covenants and agrees that it shall not assign any of the Licensed Technology to any Affiliate or Third Party unless the obligations under this Agreement (and the Oncternal License and Assignment Agreement) are also assigned, pursuant to this Section 16.1, to and explicitly assumed by such Affiliate or Third Party in writing. Any attempted assignment in contravention of the foregoing shall be null and void. Absent a novation executed

by the Parties, the assigning Party shall continue to be liable to the non-assigning Party for any breaches of this Agreement by the Affiliate, successor in interest or acquirer.

16.2 **Severability**. Should one or more of the provisions of this Agreement become void or unenforceable as a matter of law, then such provision will be ineffective only to the extent of such prohibition or invalidity, without invalidating the remainder of this Agreement, and the Parties agree to substitute a valid and enforceable provision therefor which, as nearly as possible, achieves the desired economic effect and mutual understanding of the Parties under this Agreement.

16.3 **Governing Law**. This Agreement shall be governed by and construed under the laws in effect in the State of California, without giving effect to any conflicts of laws provision thereof or of any other jurisdiction that would produce a contrary result, except that issues subject to the arbitration clause and any arbitration hereunder shall be governed by the applicable commercial arbitration rules and regulations.

16.4 **Force Majeure**. Except with respect to delays or nonperformance by a Party caused by the negligent or intentional act or omission of such Party, any delay or nonperformance by such Party will not be considered a breach of this Agreement to the extent such delay or nonperformance is caused by acts of God, natural disasters, acts or failures to act of the government (including any Regulatory Authority) or civil or military authority, fire, floods, epidemics, quarantine, energy crises, war or riots or other similar cause outside of the reasonable control of such Party (each, a "**Force Majeure Event**"), provided that the Party affected by such Force Majeure Event will promptly begin or resume performance as soon as reasonably practicable after the event has abated. If the Force Majeure Event prevents a Party from performing any of its obligations under this Agreement for one hundred eighty (180) days or more, then the other Party may terminate this Agreement immediately upon written notice to the non-performing Party.

16.5 **Waivers and Amendments**. The failure of any Party to assert a right hereunder or to insist upon compliance with any term or condition of this Agreement shall not constitute a waiver of that right or excuse a similar subsequent failure to perform any such term or condition by the other Party. No waiver shall be effective unless it has been given in writing and signed by the Party giving such waiver. No provision of this Agreement may be amended or modified other than by a written document signed by authorized representatives of each Party.

16.6 **Relationship of the Parties**. Nothing contained in this Agreement shall be deemed to constitute a partnership, joint venture, or legal entity of any type between LICENSOR and LICENSEE, or to constitute one Party as the agent of the other. Moreover, each Party agrees not to construe this Agreement, or any of the transactions contemplated hereby, as a partnership for any tax purposes. Each Party shall act solely as an independent contractor, and nothing in this Agreement shall be construed to give any Party the power or authority to act for, bind, or commit the other Party.

16.7 **Successors and Assigns**. This Agreement shall be binding upon and inure to the benefit of the Parties hereto and their respective successors and permitted assigns.

16.8 Notices. Any notice, request, demand or other communication required or permitted hereunder shall be in writing and shall be deemed to have been given (i) if delivered or sent by facsimile transmission, upon receipt, (ii) if sent by reputable courier service guaranteeing overnight delivery, on the next Business Day, (iii) if sent by registered or certified mail, upon the sooner of the date on which receipt is acknowledged or the expiration of three (3) Business Days after deposit in United States post office facilities properly addressed with postage prepaid, or (iv) if sent by electronic mail, upon confirmed receipt. All notices to a party will be sent to the addresses set forth below or to such other address or person as such party may designate by notice to each other Party hereunder:

If to LICENSOR:	Velos Biopharma Holdings, LLC 3525 Del Mar Heights Road #821 San Diego, CA 92130-2122 Attn: Cam Gallagher, CEO
with a copy to:	Latham & Watkins LLP 12670 High Bluff Drive San Diego, CA 92130 Attn: Cheston Larson, Esq./Steven T. Chinowsky, Esq. Fax: (858) 523-5450
If to LICENSEE:	VelosBio Inc. 3210 Merryfield Row San Diego, CA 92121 Attn: Chief Executive Officer
with a copy to:	Morgan, Lewis & Bockius LLP One Market, Spear Street Tower San Francisco, CA 94105 Attn: Benjamin Pensak
If to Oncternal:	Oncternal Therapeutics, Inc. 3525 Del Mar Heights Road #821 San Diego, CA 92130-2122 Attn: James Breitmeyer, President & CEO Fax: (858) 408-3010
with a copy to:	Latham & Watkins LLP 12670 High Bluff Drive San Diego, CA 92130 Attn: Cheston J. Larson, Esq./Steven T. Chinowsky, Esq. Fax: (858) 523-5450

or to such other place and with such other copies as either party may designate as to itself by written notice to the other.

16.9 Further Assurances. Each Party hereby covenants and agrees without the necessity of any further consideration, to execute, acknowledge and deliver any and all such other documents and take any such other action as may be reasonably necessary or appropriate, at the cost of the requesting Party (unless otherwise set forth herein), to carry out the intent and purposes of this Agreement.

16.10 **No Third Party Beneficiary Rights**. Except with respect to Oncternal which shall be deemed to be an intended third party beneficiary of LICENSOR's rights under this Agreement and except as otherwise expressly stated herein, this Agreement is not intended to and shall not be construed to give any Third Party any interest or rights (including, without limitation, any third party beneficiary rights) with respect to or in connection with any agreement or provision contained herein or contemplated hereby.

16.11 **Entire Agreement**. This Agreement, together with its Schedules and the Assignment and the Transition Services Agreement and Asset Purchase Agreement, sets forth the entire agreement and understanding of the Parties and their Affiliates as to the subject matter hereof and supersedes all proposals, oral or written, and all other prior communications, understandings, discussions, negotiations or agreements between the Parties and their Affiliates with respect to such subject matter. In the event of any inconsistency between this Agreement, and the Transition Services Agreement or Asset Purchase Agreement, this Agreement shall control.

16.12 **Counterparts**. This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

16.13 **Cumulative Remedies**. No remedy referred to in this Agreement is intended to be exclusive, but each shall be cumulative and in addition to any other remedy referred to in this Agreement or otherwise available under law.

16.14 **Interpretation; Waiver of Rule of Construction**.

16.14.1 Except where the context expressly requires otherwise, (a) the use of any gender herein shall be deemed to encompass references to either or both genders, and the use of the singular shall be deemed to include the plural (and vice versa), (b) the words "include", "includes" and "including" shall be deemed to be followed by the phrase "without limitation" (and, for clarity, where words such as "without limitation" follow "including" in this Agreement no alternative or additional meaning is intended), (c) the word "shall" shall be construed to have the same meaning and effect as the word "will", (d) any definition of or reference to any agreement, instrument or other document herein shall be construed as referring to such agreement, instrument or other document as from time to time amended, supplemented or otherwise modified (subject to any restrictions on such amendments, supplements or modifications set forth herein), (e) any reference herein to any Person shall be construed to include the Person's successors and permitted assigns, (f) the words "herein", "hereof" and "hereunder", and words of similar import, shall be construed to refer to this Agreement in its entirety and not to any particular provision hereof, (g) all references herein to Sections or Schedules shall be construed to refer to Sections or Schedules of this Agreement, and references to this Agreement include all Schedules hereto, (h) the word "notice" means notice in writing (whether or not specifically stated) and shall include notices, consents, approvals and other written communications contemplated under this Agreement, (i) the term "or" shall be interpreted in the inclusive sense commonly associated with the term "and/or", (j) the phrase "non-creditable and non-refundable" shall

not forestall a Party's right to claim or receive damages in connection with a breach of this Agreement (including damages that are equal to or less than any payment described as "non-creditable and non-refundable"), and (k) the phrases "relating exclusively" or "relate exclusively" or the like shall be understood to mean that the object of such phrase may be the entirety of something or may be a portion of a greater whole.

16.14.2 Each Party has had the opportunity to consult with counsel in connection with the review, drafting and negotiation of this Agreement. Accordingly, any rule of construction that any ambiguity in this Agreement shall be construed against the drafting Party shall not apply.

16.15 **Guaranty**. In consideration of the rights granted to LICENSOR under this Agreement, and to induce LICENSEE to enter into this Agreement, Oncternal, hereby irrevocably and unconditionally guarantees, in favor of LICENSEE and its Affiliates, the performance of all of LICENSOR's obligations under Sections 2.1 (License Grant), 2.2 (Sublicense Rights), 2.3 (UCSD License Agreement), 2.5.1 and 2.5.3 (Exclusivity), 2.6 (Oncternal License and Assignment Agreement), 3.4 (Right of Reference), 6.2 (Patent Prosecution), 9.1 (Representations, Warranties and Covenants), 9.3 (Additional Representations, Warranties and Covenants by LICENSOR), 10.2 (Indemnification by LICENSOR), 16.1 (Assignment) and 16.9 (Further Assurances); Articles 6 (Intellectual Property Rights), 7 (Infringement; Misappropriation), 8 (Confidentiality) and 15 (Product IP Assignment); and Schedules C and D; in each case subject to any defenses, counter-claims and limitations of liabilities which are available to LICENSOR; provided that if at the time of such non-performance by LICENSOR, LICENSOR is not an Affiliate of Oncternal, then the foregoing guaranty shall apply solely to the extent the breach or failure in performance by LICENSOR of its obligation arises out of or results from the negligence or willful misconduct of Oncternal or the breach by Oncternal of obligations under the Oncternal License and Assignment Agreement. Oncternal agrees to take such action as may be necessary to keep itself informed as to the scope and performance of such obligations and of the affairs of LICENSOR and agrees that LICENSEE has no obligation to notify Oncternal of any matter which may increase or change its obligations hereunder as a guarantor or to assist Oncternal in managing or supervising LICENSOR. No failure or delay or lack of demand, notice or diligence in exercising any right under this Section 16.15 shall operate as a waiver thereof, nor shall any single or partial exercise of any such right preclude any other or further exercise thereof or the exercise of any other right under this Section 16.15. This guarantee is an absolute, unconditional and continuing guarantee of performance. Any provision of this Section 16.15 that is prohibited or unenforceable in any jurisdiction shall, as to such jurisdiction, be ineffective to the extent of such prohibition or unenforceability without invalidating the remaining provisions hereof, and any such prohibition or unenforceability in any jurisdiction shall not invalidate or render unenforceable such provision in any other jurisdiction. Oncternal represents, warrants and covenants to LICENSEE that it has the corporate power and authority to enter into this guarantee, that all corporate and governmental approvals needed by it to enter into and to perform

hereunder have been secured or obtained, and that the provisions of this Section 16.15 are a legal and valid obligation binding upon it and is enforceable in accordance with its terms, and that the execution hereof does not conflict with any agreement, undertaking, or instrument to which it is a party. Oncternal hereby expressly waives any requirement that LICENSEE exhaust any right, power or remedy against LICENSOR hereunder prior to proceeding directly against Oncternal under this Section 16.15.

[Signatures on next page]

IN WITNESS WHEREOF, the parties have duly executed this Agreement as of the date first set forth above.

LICENSOR:

Velos Biopharma Holdings, LLC

By: /s/ Cam Gallagher
Name: Cam Gallagher
Its: Chief Executive Officer

LICENSEE:

VelosBio Inc.

By: /s/ David Johnson
Name: David Johnson
Its: President and Chief Executive Officer

With respect to relevant Sections and Articles of this Agreement only:

Oncternal Therapeutics, Inc.

By: /s/ James Breitmeyer
Name: James Breitmeyer
Its: President and Chief Executive Officer

SCHEDULE A: PLATFORM PATENTS

Patent families 701, 702, 703, 704 and 708 as detailed further below:

Docket No. (51956)	Country	Application No. (Patent No.)	Filing Date (Issue Date)	Status

[***]

SCHEDULE B: PRODUCT IP

Patents and patent applications:

- Patent families 710, 711 and 712, as detailed further below:

Institute / Collaborator	Study No.	Study
MDACC (Wang)	1	DLBCL PDX model
	2	In vitro characterization of VLS-101 in MCL & DLBCL
OHSU (Tyner / Spurgeon)	1	In vitro characterization of VLS-101 in B-ALL and MCL
	2	Immunohistochemical analysis of ROR1
Baylor (Yustein)	1	In vitro characterization of VLS-101 in sarcoma
Italian Institute for Genomic Research, Torino (Deaglio)	1	In vivo of VLS-101 in PDX model RS-9737
	2	In vivo efficacy of VLS-101 in PDX model RS-1010
	3	In vivo efficacy of VLS-101 in PDX model RS-1050
UCSD (Kipps)	1	In vivo efficacy of VLS-101 in CLL model (engrafted)
	2	In vivo efficacy of VLS-101 in CLL model
	3	In vivo efficacy of VLS-101 in Ovarian PDX model (incomplete)

CRO/ Vend	Study No.
Wuxi	WBP837-BCD-OTR-001
Wuxi	WBP837-BCD-OTR-002-01
Wuxi	WBP837-BCD-OTR-003-01
Wuxi	WBP837-BCD-OTR-004-01

Know-How (in each case, to the extent exclusively related to a Product):

- Know-How owned or controlled by LICENSOR or Oncternal (prior to or on the Effective Date) or LICENSEE (after the Effective Date) under any of the Assigned Contracts (as defined in the Asset Purchase Agreement)
- Images and structures, and any related descriptions, reflected in LICENSOR's or Oncternal's board meeting minutes or materials
- Know-How owned or controlled by LICENSOR or Oncternal and arising out of any of the following activities under agreements between Oncternal and the indicated counterparty:

- Know-How owned or controlled by LICENSOR or Oncternal and arising out of any of the following activities:

Institute / Collaborator	Study No.	Study
MDACC (Wang)	1	DLBCL PDX model
	2	In vitro characterization of VLS-101 in MCL & DLBCL
OHSU (Tyner / Spurgeon)	1	In vitro characterization of VLS-101 in B-ALL and MCL
	2	Immunohistochemical analysis of ROR1
Baylor (Yustein)	1	In vitro characterization of VLS-101 in sarcoma
Italian Institute for Genomic Research, Torino (Deaglio)	1	In vivo of VLS-101 in PDX model RS-9737
	2	In vivo efficacy of VLS-101 in PDX model RS-1010
	3	In vivo efficacy of VLS-101 in PDX model RS-1050
UCSD (Kipps)	1	In vivo efficacy of VLS-101 in CLL model (engrafted)
	2	In vivo efficacy of VLS-101 in CLL model
	3	In vivo efficacy of VLS-101 in Ovarian PDX model (incomplete)

CRO/ Vend	Study No.
Wuxi	WBP837-BCD-OTR-001
Wuxi	WBP837-BCD-OTR-002-01
Wuxi	WBP837-BCD-OTR-003-01
Wuxi	WBP837-BCD-OTR-004-01

SCHEDULE C: FORM OF ASSIGNMENT-IN-PART OF UCSD LICENSE AGREEMENT

PARTIAL ASSIGNMENT AND ASSUMPTION OF LICENSE AGREEMENT

This PARTIAL ASSIGNMENT AND ASSUMPTION OF LICENSE AGREEMENT, dated as of February 6, 2018 (this "***Assignment***"), by and between VELOS BIOPHARMA HOLDINGS, LLC, a Delaware limited liability company ("***Assignor***"), and, VelosBio Inc. a Delaware corporation ("***Assignee***"). Assignor and Assignee are referred to herein individually as a "***Party***" and collectively as the "***Parties***." Oncternal Therapeutics, Inc. is a party to this Agreement solely for purposes of Section 4 and Annex 2, part 3.

WHEREAS, Assignor and Assignee have entered into a License and Assignment Agreement, dated as of February 6, 2018 (the "***License and Assignment Agreement***"), pursuant to which Assignor has agreed to license certain intellectual property relating to the Products (as hereinafter defined), including a partial assignment and assumption of that certain License Agreement, dated March 31, 2016, by and between Oncternal Therapeutics, Inc., a Delaware corporation (together with its successors and permitted assigns (other than Assignor), "***Oncternal***") and The Regents of the University of California, as amended (the "***UCSD License Agreement***"), attached hereto as Annex 1, but only insofar as it relates to the Products.

WHEREAS, Section 10.3 of the UCSD License Agreement provides that the UCSD License Agreement may be assigned by Assignor in whole or in part to an affiliate which agrees to be bound by the terms of the UCSD License Agreement upon written notice to The Regents of the University of California.

WHEREAS, as of the date hereof, Oncternal, Assignor and Assignee are all affiliates of each other.

WHEREAS, on the date hereof, pursuant to that certain License and Assignment Agreement between Oncternal and Assignor, Oncternal assigned and transferred to Assignor, and Assignor agreed to accept and assume, all rights and obligations of Oncternal under the UCSD License Agreement with respect only to the Products.

WHEREAS, pursuant to Section 2.3 of the License and Assignment Agreement, Assignor has agreed to assign and transfer to Assignee, and Assignee has agreed to accept and assume, all rights and obligations of Assignor under the UCSD License Agreement with respect only to the Products, as hereinafter set forth.

NOW, THEREFORE, in consideration of the premises and the mutual representations, warranties, covenants, conditions and agreements set forth herein and in the License and Assignment Agreement and for other valuable consideration, receipt of which is hereby acknowledged, the Parties, intending to be legally bound, hereby agree as follows:

1. Defined Terms. As used herein, the following terms have the following meanings:

"***ADC Product***" means any product containing or comprising a ROR1 reactive Antibody conjugated or fused directly or indirectly with a cytotoxic or cytostatic compound or radionuclide (or any other method of delivering a toxic moiety to a cell using an Antibody). For clarity, "ADC Product" includes, but is not limited to, any Bispecific Product conjugated, fused, or operatively linked directly or indirectly with a cytotoxic or cytostatic compound or radionuclide (or any other method of delivering a toxic moiety to a cell using an Antibody), but excludes a CAR-T Product.

"***Antibody***" means all forms of antibodies, including, but not limited to: murine, chimeric, primatized, humanized, de-immunized, and human; as well as all intact antibodies and fragments (including, but not limited to, Fab, scFv formats (including diabodies and tandem scFvs), single domain antibodies (such as nanobodies), and small modular immunopharmaceuticals (SMIPs)). For clarity, an Antibody includes any Antibody whose carbohydrates or Fc region have been chemically or genetically modified, for example, to alter its pharmacokinetics, or its interactions with immune effector cells or complement components.

"***Bispecific Product***" means any product containing or comprising a ROR1 reactive Antibody conjugated, fused, or operatively linked to any other moiety such that such product can bind simultaneously one or more epitopes on ROR1 and one or more different targets (e.g., polypeptide, carbohydrate, or lipid). For clarity, Bispecific Product does not include a CAR-T Product, but does include "multispecific" Antibodies.

"***CAR-T Product***" means any product that is a genetically engineered immune effector cell expressing a ROR1 reactive Antibody or the genetic techniques to produce them, or other genetically engineered cellular therapies having an affinity for ROR1. For clarity, a CAR-T Product can also include additional Antibodies recognizing other cellular targets, or the genetic techniques to produce them, but does not include any Bispecific Product.

"***Field***" means therapeutic, diagnostic and preventive applications in all indications.

"***Licensed Method***" has the meaning set forth in the UCSD License Agreement.

"***Licensed Product***" has the meaning set forth in the UCSD License Agreement.

"***Platform Patents***" has the meaning set forth in the License and Assignment Agreement.

"***Products***" means any product (i) that is an ADC Product or a Bispecific Product and (ii) would constitute a Licensed Product under the UCSD License Agreement. For clarity, Products may contain a toxic payload and also be reactive with other targets in addition to ROR1. For further clarity, subject to the final sentence of Section 2.1.1 the License and Assignment Agreement, Products does not include CAR-T Products or ROR1 Antibody Products.

"***ROR1 Antibody Product***" means any product containing or comprising a ROR1 reactive Antibody, including, without limitation, cirmtuzumab, that is not an ADC Product or a Bispecific Product.

"***Technology***" has the meaning set forth in the UCSD License Agreement.

"***Territory***" has the meaning set forth in the UCSD License Agreement.

"***Term***" has the meaning set forth in the UCSD License Agreement.

2. Assignment in Part. Subject to the terms set forth herein, Assignor does hereby assign, transfer and deliver to Assignee, and Assignee hereby accepts and assumes and agrees to timely perform, pay and discharge, all rights, duties and obligations of Assignor under the UCSD License Agreement with respect to, and only to the extent that, such rights, duties and obligations relate to the Products, which assignment in part includes an assignment of the license under Section 2.1 of the UCSD License Agreement under the Platform Patents to make and have made, to use and have used, to sell and have sold, to offer for sale, and to import and have imported Products (but no other Licensed Products) and to practice Licensed Methods with respect to Products (but no other Licensed Products) and to use Technology in the Field with respect to Products (but no other Licensed Products) within the Territory and during the Term, in all cases on and subject to the terms and conditions of the UCSD License Agreement. Nothing herein shall be deemed or construed to constitute an assignment of any rights under the UCSD License Agreement relating to any Licensed Products other than the Products. Assignee hereby agrees to be bound by and comply with the terms of the UCSD License Agreement (including, without limitation, Section 3.1(c)B, Section 3.1(c)D, Section 3.3(a)(i)-(v), Section 3.3(a)B, Section 3.3(a)D, Section 3.4, Article 4, Article 5, Article 6 and Section 8.2 thereof) and to perform, discharge and be responsible for all liabilities arising thereunder to the extent relating solely to the Products. Without limiting the foregoing, the Parties hereby acknowledge and agree that the fees, milestones and other payments set forth on, or allocated to Assignee in, Annex 2 hereto relate to the Products (or, with respect to general payments, represent the portion of such payments attributable to the Products), and such fees, milestones and other payments are assigned and delegated to, and assumed by, Assignee hereunder.

3. No Merger. Nothing contained in this Assignment shall in any way supersede, modify, replace, amend, change, rescind, waive, exceed, expand, enlarge or otherwise affect the provisions of the License and Assignment Agreement, including the warranties, covenants, agreements, conditions and representations contained in the License and Assignment Agreement and, in general, any of the rights and remedies, and any of the obligations and indemnifications, of Assignor or Assignee set forth in the License and Assignment Agreement. Except as expressly provided in the License and Assignment Agreement, this Assignment is made without warranty of any kind, express or implied at common law, by statute or otherwise.

4. Further Assurances. Assignor and Assignee each covenant and agree, in connection with the License and Assignment Agreement and this Assignment, promptly to execute and deliver any additional documents and instruments and perform any additional acts that may be reasonably necessary or desirable to effectuate and perform more fully the provisions of this Assignment and the assignment and assumption in part made pursuant to Section 2 hereof.

5. Miscellaneous. This Assignment: (a) is executed pursuant to the License and Assignment Agreement, (b) shall be governed by and construed in accordance with the internal laws of the State of California, without regard to the principles of conflicts of law thereof, (c) shall be binding upon and inure to the benefit of the Parties and their respective successors and permitted assigns and (d) may be executed and delivered either originally or by facsimile transmission or electronic transmission in PDF format, and in one or more counterparts, each of which shall be considered an original document, but all of which together shall be considered one and the same document. This Assignment may not be amended, modified, supplemented or waived except in a writing signed by each of Assignor and Assignee. The section headings contained in this Assignment are for reference purposes only and shall not affect in any way the meaning or interpretation of this Assignment. Capitalized terms used herein and not otherwise defined have the meanings set forth in the License and Assignment Agreement.

[*Signature pages follow*]

This Partial Assignment and Assumption of License Agreement is being executed and delivered by Assignor and Assignee and shall be effective as of the date first above written.

ASSIGNOR:

Velos Biopharma Holdings, LLC

By: /s/ Cam Gallagher
Name: Cam Gallagher
Its: Chief Executive Officer

ASSIGNEE:

VelosBio Inc.

By: /s/ David Johnson
Name: David Johnson
Its: President and Chief Executive Officer

With respect to relevant Sections of this Partial Assignment and Assumption of License Agreement only:

Oncternal Therapeutics, Inc.

By: /s/ James Breitmeyer
Name: James Breitmeyer
Its: President and Chief Executive Officer

Annex 1

UCSD License Agreement

Annex 2

Fees, Milestones and Payments Assumed by Assignee

The Parties hereby acknowledge and agree that the fees, royalties and other payments set forth below relate or are attributable to the Products, and accordingly Assignee hereby assumes and agrees to timely pay and discharge the fees, royalties and other payments set forth below. The Parties further acknowledge and agree that the following payment terms are subject to Section 2.3.1 and any amended or alternate agreement that one or both Parties (and/or their Affiliates) and UCSD may enter.

1. License Maintenance Fees

   Fifty percent (50%) of the annual license maintenance fee payable under Section 3.1(b) of the UCSD License Agreement from and after January 1, 2018 shall be assigned to and assumed, paid and discharged by Assignee. For clarity, Assignee's responsibilities for License Maintenance Fees shall commence as of January 1, 2018 and does not include any such fees due prior to such date.

2. Milestone Payments

   All of the milestone payments payable under Section 3.1(c) of the UCSD License Agreement under subclause B ("For the first ADC Licensed Product") and subclause D ("For the first Antibody Fragment or Synthetic Antibody Licensed Product") of such Section shall be assigned to and assumed, paid and discharged by Assignee.

3. Sales Milestones

   All of the milestone payments payable under Section 3.1(c) of the UCSD License Agreement under subclause E thereof relating to Net Sales (as defined in the UCSD License Agreement) of Products shall be assigned to and assumed, paid and discharged by Assignee. In the event that any such milestone payment is triggered by cumulative Net Sales of Products and Net Sales by Oncternal of other Licensed Products, the portion of such milestone payment so assumed and payable by Assignee shall equal the percentage of the aggregate Net Sales of Licensed Products constituting Net Sales of Products.

   Each of Assignor (and Oncternal) and Assignee would have the right to audit the other party's applicable books and records with respect to Net Sales of Licensed Products in accordance with Section 5.1.2 applied *mutatis mutandis.*

4. Royalty Payments

   The royalty payments payable under Section 3.1(d) of the UCSD License Agreement relating to Net Sales (as defined in the UCSD License Agreement) of "ADC Licensed Products" and "Antibody Fragment or Synthetic Antibody Licensed Products" shall be assigned to and assumed, paid and discharged by Assignee.

5. Sublicense Fees

Any and all Sublicense Fees or Sublicense royalty payments (as such terms are defined or used in the UCSD License Agreement) payable under Section 3.1(g)-(h) relating to any sublicense by or through Assignee related to the Products shall be assigned to and assumed, paid and discharged by Assignee.

6. Minimum Payment Obligation

In the event that any minimum annual royalty payment is triggered under Section 3.1(i) of the UCSD License Agreement from and after the first calendar year of commercial sales of Products by Assignee (or its Affiliates or sublicensees), a percentage of such minimum annual royalty payment shall be assigned to and assumed, paid and discharged by Assignee, which percentage shall represent the percentage of total earned royalties contributed by Oncternal (or its affiliates of sublicensees). By way of illustration, if the minimum annual royalty for a calendar year is $500,000, and Assignee pays total earned royalties of $100,000 and Oncternal pays total earned royalties of $25,000 in such calendar year, Oncternal has contributed 20% of the total earned royalties and thus Licensee is only responsible for 20% of the residual minimum annual royalty of $375,000, or $75,000 and Oncternal is responsible for 80% of the of the residual minimum annual royalty of $375,000, or $300,000.

7. Patent Costs

All of the reimbursements or advance payments payable under Section 3.2 of the UCSD License Agreement for Patent Costs (as defined in the UCSD License Agreement) that relate exclusively to Products shall be assigned to and assumed, paid and discharged by Assignee. In the event that any such Patent Costs relate to Platform Patents that relate to both Products and other Licensed Products, Assignee shall assume and be responsible for 50% of such Patent Cost.

As of the Effective Date, such amounts equal $165,400.

8. Biosite and Xoma Payments

All payments due to or in respect of either Biosite Incorporated or Xoma Technology Ltd. under the UCSD License Agreement (and the agreements with Biosite and Xoma Technology referenced therein) shall be assigned to and assumed, paid and discharged by the Party that is developing or marketing the applicable product.

9. Annual Spend

Fifty percent (50%) of all payments due under Section 3.3(a)(ii) of the UCSD License Agreement shall be assigned to and assumed, paid and discharged by Assignee.

10. Research & Development

Fifty percent (50%) of all payments due under Section 3.4 of the UCSD License Agreement shall be assigned to and assumed, paid and discharged by Assignee from and after January 1, 2018. For clarity, Assignee's responsibilities for such payments shall commence as of January 1, 2018 and do not include any such fees due prior to such date.

11. Selexis Royalties

As set forth in the Transition Services Agreement.

SCHEDULE D

BILL OF SALE AND ASSIGNMENT AND ASSUMPTION

This Bill of Sale and Assignment and Assumption ("Bill of Sale") dated as of February 6, 2018 is executed and delivered by Velos Biopharma Holdings LLC (the "Assignor") and VelosBio Inc. (the "Assignee").

WHEREAS, pursuant to that certain License and Assignment Agreement, dated February 6, 2018, by and between the Assignor and the Assignee (the "Agreement"), the Assignor has agreed to sell, assign, transfer and deliver to the Assignee the Product IP, and the Assignee has agreed to accept and assume the Product IP.

NOW, THEREFORE, in consideration of the mutual promises set forth in the Agreement and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Assignor hereby agrees as follows:

1. The Assignor hereby sells, assigns, transfers and delivers to the Assignee, its successors and assigns, to have and to hold forever, all right, title and interest in, to and under all of the Product IP. For purposes of convenience, "Product IP" is defined to mean (i) the patents and patents applications set forth on Annex 1 (to this Bill of Sale) (including all related family members) and (ii) all Know–How, patent rights, trademarks, service marks, good will, moral rights, and any and all other intellectual property or proprietary rights (including, without limitation, applications relating thereto and the right to sue for infringement, including past infringement), whether or not patentable now known or hereafter recognized in any jurisdiction owned or controlled by Assignor, Oncternal Therapeutics, Inc. or any of its or their Affiliates as of January 5, 2018 that is exclusively related to a Product, including the Know-How set forth on Annex 1 (to this Bill of Sale).

2. This Bill of Sale and all of its terms shall inure to the benefit of the parties hereto and their respective successors and assigns and shall bind the parties and their respective successors and assigns.

3. Each party hereto agrees that it will, from time to time after the date hereof, without further consideration, execute, acknowledge and deliver all such further acts, assignments, transfers, conveyances, evidences of title, assumptions and assurances as may be required to carry out the intent of this Bill of Sale, including preparing a notarized version of this Bill of Sale upon the request of a party. Each party hereby appoints the other party as its attorney-in-fact to do, at the other party's option, all acts necessary or appropriate to effectuate the assignments pursuant to Section 1 above, including executing and recording all instruments appropriate to effect and confirm any such assignment, and the subsequent prosecution, maintenance, and enforcement of any Product IP. These powers of attorney are coupled with an interest and are irrevocable.

4. With respect to the patents and patent applications included within the Product IP:

a. Assignor has assigned and/or by these presents does hereby sell, assign, transfer and convey unto Assignee, the whole and entire right, title and interest (i) in and to the patents identified in Annex 1 (to this Bill of Sale) ("Patents"), for the territory of the United States and its possessions and territories and all foreign countries; (ii) in and to any and all United States and foreign patent applications claiming priority to the Patents including, without limitation, applications for patents including provisionals, non-provisionals, divisions, continuations, continuations-in-part, requests for continued examinations, utility models, PCT applications and designs and any other related United States and foreign applications and equivalents thereof (the "Applications"), along with the right to claim priority to the Applications under any treaty relating thereto; (iii) in and to all United States and foreign patents, utility models, inventor's certificates and designs and all equivalents thereof which may be granted for the Patents or the Applications, including extensions, renewals, reissues and reexamination certificates thereof (the "Future Patents"); and (iv) in and to all rights to sue or claim for damages, injunctive reliefs and administrative reliefs and collect damages resulting from past, present and future infringement of any and all of the Patents and the Future Patents.

b. The Patents, the Applications and the Future Patents shall be held and enjoyed by Assignee, for Assignee's own use and benefit, and for Assignee's legal representatives and assigns, to the full end of the term or terms of the Patents and the Future Patents, as fully and entirely as the same would have been held by Assignor had this assignment and sale not been made; and for the aforesaid consideration, Assignor hereby covenants, agrees and undertakes to execute promptly or cause to be executed promptly, whenever requested by Assignee, all patent applications, assignments, lawful oaths and any other papers which Assignee may deem necessary or desirable for securing to Assignee or for maintaining for Assignee all of the Patents, the Applications and the Future Patents hereby assigned or agreed to be assigned, all without further compensation to Assignor, but at the reasonable and pre-approved cost and expense of the Assignee, its successors, legal representatives, and assigns. It is agreed that Assignor shall be legally bound, upon request of Assignee or its successors or assigns or a legal representative thereof, to supply all information and evidence of which the undersigned has knowledge or possession, relating to the making and practicing of the Patents and to testify in any legal proceeding relating thereto without further compensation to Assignor, but at the reasonable and pre-approved cost and expense of the Assignee, its successors, legal representatives, and assign.

5. This Bill of Sale shall be governed by, and construed and enforced in accordance with, the laws of the State of California other than conflict of laws principles thereof directing the application of any law other than that of California. Courts within the

State of California will have jurisdiction over all disputes between the parties hereto arising out of or relating to this Bill of Sale and the agreements, instruments and documents contemplated hereby. The parties hereby consent to and agree to submit to the jurisdiction of such courts. Each of the parties hereto waives, and agrees not to assert in any such dispute, to the fullest extent permitted by applicable law, any claim that: (i) such party is not personally subject to the jurisdiction of such courts, (ii) such party and such party's property is immune from any legal process issued by such courts or (iii) any litigation commenced in such courts is brought in an inconvenient forum.

6. All capitalized terms not defined herein shall have the meaning set forth in the Agreement.

[*Signatures appear on next page*]

IN WITNESS WHEREOF, intending to be legally bound hereby, the parties hereto has caused this instrument to be signed in its name by its duly authorized representatives as of the date first above written.

VELOS BIOPHARMA HOLDINGS, LLC

By: /s/Cam Gallagher
Name: Cam Gallagher
Title: Chief Executive Officer

VELOSBIO INC.

By: /s/David Johnson
Name: David Johnson
Title: President and Chief Executive Officer

Annex 1
Product IP

Patents and patent applications:

- Patent families 710, 711 and 712, as detailed further below:

Docket No. (51956)	Country	Application No. (Patent No.)	Filing Date (Issue Date)	Status
Family 10-ROR1 Antibody Immunoconjugates (710)				
Subject matter: Cirmtuzumab MMAE immunoconjugates Earliest Pub				
710.101	US	62/524,382	6/23/2017	Pending
Family 11-ROR1 Antibody Immunoconjugate Combination Therapies (711)				
Subject matter: Methods of treatment using Cirmtuzumab MMAE immunoconjugates and additional therapeutic agents Earliest Pub				
711.101	US	62/524,386	6/23/2017	Pending
Family 12-Immunoconjugates (712)				
Subject matter: Cirmtuzumab immunoconjugates (No MMAE) Earliest Pub				
712.101	US	62/524,388	6/23/2017	Pending

Know-How (in each case, to the extent exclusively related to a Product):

- Know-How owned or controlled by Assignor or Oncternal Therapeutics, Inc. ("Oncternal") (prior to or on the Effective Date) or Assignee (after the Effective Date) under any of the Assigned Contracts (as defined in the Asset Purchase Agreement)
- Images and structures, and any related descriptions, reflected in Assignor's or Oncternal's board meeting minutes or materials
- Know-How owned or controlled by Assignor or Oncternal and arising out of any of the following activities under agreements between Oncternal and the indicated counterparty
- Know-How owned or controlled by Seller and arising out of any of the following activities:

Institute / Collaborator	Study No.	Study
MDACC (Wang)	1	DLBCL PDX model
	2	In vitro characterization of VLS-101 in MCL & DLBCL
OHSU (Tyner / Spurgeon)	1	In vitro characterization of VLS-101 in B-ALL and MCL
	2	Immunohistochemical analysis of ROR1
Baylor (Yustein)	1	In vitro characterization of VLS-101 in sarcoma
Italian Institute for Genomic Research, Torino (Deaglio)	1	In vivo of VLS-101 in PDX model RS-9737
	2	In vivo efficacy of VLS-101 in PDX model RS-1010
	3	In vivo efficacy of VLS-101 in PDX model RS-1050
UCSD (Kipps)	1	In vivo efficacy of VLS-101 in CLL model (engrafted)
	2	In vivo efficacy of VLS-101 in CLL model
	3	In vivo efficacy of VLS-101 in Ovarian PDX model (incomplete)

CRO/ Vend	Study No.
Wuxi	WBP837-BCD-OTR-001
Wuxi	WBP837-BCD-OTR-002-01
Wuxi	WBP837-BCD-OTR-003-01
Wuxi	WBP837-BCD-OTR-004-01

SCHEDULE E
DISCLOSURE SCHEDULE
to the
LICENSE AND ASSIGNMENT AGREEMENT
among
Velos Biopharma Holdings, LLC
and
VelosBio Inc.
and
Oncternal Therapeutics, Inc.

Section 9.3.4: Oncternal has rights and obligations regarding (i) the use of the producer cell line used to generate a master cell bank for the manufacture of the cirmtuzumab antibody and (ii) use and distribution of cirmtuzumab in finished products. Those rights cannot be sublicensed without the consent of Selexis SA.

Section 9.3.5, 9.3.7 and 9.3.8
The Exploitation of one or more Products in the Field may require rights under certain intellectual property related to antibody drug conjugation.

Section 9.1(d), 9.3.4 and 9.3.11: LICENSOR is aware that the development of the cirmtuzumab antibody was sponsored in part by The California Institute for Regenerative Medicine ("CIRM"), CLL Global Research Foundation, and Blood Cancer Research Fund and as a consequence the UCSD License Agreement is subject to overriding obligations to the same under the sponsorship agreements. UCSD will not share these agreements with Oncternal or LICENSOR, but LICENSOR is not aware of any obligations under those agreements that would have an adverse impact on the license granted hereto to LICENSEE.

Section 9.3.9: LICENSEE has submitted a pre-IND Briefing package to the US FDA containing extensive information concerning the ADC Product and its characterization, including information that has not been shared with Oncternal management.

Section 9.3.14: Under the UCSD License Agreement, certain periodic written progress reports are outstanding and past due (although extensive updates have been provided during multiple joint development meetings). For a variety of business reasons, IND-enabling toxicology studies for the ADC and Genetically Engineered Cellular Therapy Licensed Products were not initiated within one year from the Effective Date of the UCSD License Agreement. Although UCSD is aware of such matters, Oncternal has not been notified of any material breach or material default under the UCSD License Agreement.

Exhibit 10.55

***CERTAIN MATERIAL (INDICATED BY THREE ASTERISKS IN BRACKETS) HAS BEEN OMITTED FROM THIS DOCUMENT BECAUSE IT IS BOTH (1) NOT MATERIAL AND (2) WOULD BE COMPETITIVELY HARMFUL IF PUBLICLY DISCLOSED.

AMENDED AND RESTATED LICENSE AGREEMENT

BETWEEN

ONCTERNAL THERAPEUTICS, INC.

AND

THE REGENTS OF THE UNIVERSITY OF CALIFORNIA

FOR

CASE NO. SD2005-212
CASE NO. SD2010-306
CASE NO. SD2011-178
CASE NO. SD2012-143
CASE NO. SD2012-403
CASE NO. SD2015-027
CASE NO. SD2015-200

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AMENDED AND RESTATED LICENSE AGREEMENT

This Amended and Restated License Agreement ("Agreement") is made by and between Oncternal Therapeutics, Inc., a Delaware corporation having an address at 3525 Del Mar Heights Road, #821, San Diego, California 92130 ("LICENSEE") and The Regents of the University of California, a California public corporation having its statewide administrative offices at 1111 Franklin Street, Oakland, California 94607-5200 ("UNIVERSITY"), represented by its San Diego campus having an address at University of California San Diego, Office of Innovation and Commercialization, Mail Code 0910, 9500 Gilman Drive, La Jolla, California 92093-0910 ("UCSD").

This Agreement is effective on the date of the last signature ("Effective Date").

RECITALS

WHEREAS, the inventions disclosed in UCSD Disclosure Docket No. SD SD2005-212, SD2010- 306, SD2011-178, SD2012-143, SD2012-403, SD2015-027 and SD2015-200 and titled, respectively, "Method for determining leukemic cells apart from normal cells," "Receptor tyrosine kinase-like orphan receptor (ROR1) single chain Fv antibody fragment conjugates and methods of use thereof," "Antitumor properties of particular monoclonal antibodies specific for ROR1," "Antihuman ROR1-specific monoclonal antibodies," "ROR1 peptide-based vaccine for ROR1+ cancers," "Cancer treatment using a new combination of antitumor compound and antitumor antibody" and "UC-961 blocks Wnt5a-induced non-canonical Wnt-signaling" (collectively, "Inventions"), were made in the course of research at UCSD by Dr. Thomas Kipps and his associates (hereinafter and collectively, the "Inventors") and are covered by Patent Rights as defined below;

WHEREAS, the research was sponsored in part by the Government of the United States of America and as a consequence this license is subject to overriding obligations to the Federal Government under 35 U.S.C. §§ 200-212 and applicable regulations;

WHEREAS, the development of the Inventions was sponsored in part by The California Institute for Regenerative Medicine ("CIRM"), CLL Global Research Foundation, and Blood Cancer Research Fund ("Sponsors") and as a consequence this license is subject to overriding obligations to the same under the sponsorship agreements;

WHEREAS, LICENSEE obligations to CIRM under Title 17, California Code of Regulations are appended in Exhibit A;

WHEREAS, the Inventors are employees of UCSD, and they are obligated to assign all of their right, title and interest in the Inventions to UNIVERSITY;

WHEREAS, LICENSEE, through Hale BioPharma Ventures LLC, entered into a secrecy agreement (UC Control No. 2015-20-0548) with UNIVERSITY, effective May 18, 2015, for the purpose of evaluating the Inventions;

WHEREAS, LICENSEE entered into a Letter of Intent (UC Control No. 2016-30-0316) with UNIVERSITY, effective December 21, 2015, for the purpose of negotiating this Agreement;

WHEREAS, LICENSEE entered into a License Agreement (UC Control No. 2016-03-0432) with UNIVERSITY, effective March 31, 2016 (the "Original Agreement"); and Amendment No. 1 (UC Control No. 2016-03-0432 R(501);

WHEREAS, UNIVERSITY is desirous that the Inventions be developed and utilized to the fullest possible extent so that its benefits can be enjoyed by the general public;

WHEREAS, LICENSEE is desirous of obtaining certain rights from UNIVERSITY for commercial development, use, and sale of the Inventions, and the UNIVERSITY is willing to grant such rights;

WHEREAS, LICENSEE understands that UNIVERSITY may publish or otherwise disseminate information concerning the Inventions at any time and that LICENSEE is paying consideration thereunder for its early access to the Inventions, not continued secrecy therein;

WHEREAS, LICENSE AND UNIVERSITY desire to amend and restate the Original Agreement as set forth below.

NOW, THEREFORE, the parties agree:

ARTICLE 1. DEFINITIONS

The terms, as defined herein, shall have the same meanings in both their singular and plural forms.

1.1 "ADC Product" means any product containing or comprising a ROR1 reactive Antibody (or antibody fragment) conjugated or fused directly or indirectly with a cytotoxic or cytostatic compound or radionuclide (or any other method of delivering a toxic moiety to a cell using an Antibody). For clarity, "ADC Product" includes, but is not limited to, any Bispecific Product conjugated, fused, or operatively linked directly or indirectly with a cytotoxic or cytostatic compound or radionuclide (or any other method of delivering a toxic moiety to a cell using an Antibody), but excludes a Genetically Engineered Cellular Therapy or CAR-T Licensed Product (defined below).

1.2 "Affiliate" means any corporation or other business entity which is bound in writing by LICENSEE to the terms set forth in this Agreement and in which LICENSEE owns or controls, directly or indirectly, at least fifty percent (50%) of the outstanding stock or other voting rights entitled to elect directors, or in which LICENSEE is owned or controlled directly or indirectly by at least fifty percent (50%) of the outstanding stock or other voting rights entitled to elect directors; but in any country where the local law does not permit foreign equity participation of at least fifty percent (50%), then an "Affiliate" includes any company in which LICENSEE owns or controls or is owned or controlled by, directly or indirectly, the maximum percentage of outstanding stock or voting rights permitted by local law.

1.3 "Antibody" means all forms of antibodies, including, but not limited to: murine, chimeric, primatized, humanized, de-immunized and human; as well as all intact antibodies and fragment.

1.4 “Antibody Licensed Product” means any product containing or comprising a ROR1 reactive Antibody, including, without limitation, cirmtuzumab, that is not an ADC Product or a Bispecific Product.

1.5 “Biosite Agreement” means the Service Agreement by and between Biosite Incorporated and University, dated June 14, 2010.

1.6 “Bispecific Product” means any product containing or comprising a ROR1 reactive Antibody (or antibody fragment) conjugated, fused, or operatively linked to any other moiety such that such product can bind simultaneously one or more epitopes on ROR1 and one or more different targets (e.g., polypeptide, carbohydrate, or lipid) and covered under Patent Rights. For clarity, Bispecific Product does not include a Genetically Engineered Cellular Therapy or CAR-T Licensed Product, but does include “multispecific” Antibodies.

1.7 “Combination Product” means any product which is a Licensed Product (as defined below) and contains, other product(s) that is not an excipient, diluent, adjuvant, buffer and the like and (i) does not use Inventions, Technology or Patent Rights (as defined below); (ii) the sale, use or import by itself does not contribute to or induce the infringement of Patent Rights; (iii) is sold separately by LICENSEE, its Sublicensee (as defined below) or an Affiliate; and (iv) enhances the market price of the final product(s) sold, used or imported by LICENSEE, its Sublicensee, or an Affiliate.

1.8 “Field” means human therapeutic, diagnostic and preventive applications in all indications; provided that the “Field” does not include (i) the development or commercialization of an “ADC Product” (defined above), or (ii) a “Bispecific Product” (defined above).

1.9 “Genetically Engineered Cellular Therapy or CAR-T Licensed Product” means any product that is a genetically engineered immune effector cell expressing a ROR1 reactive Antibody or the genetic techniques to produce it, or other genetically engineered cellular therapies having an affinity for ROR1. For clarity, a Genetically Engineered Cellular Therapy or CAR-T Product can also include additional Antibodies recognizing other cellular targets, or the genetic techniques to produce them, but does not include any Bispecific Product.

1.10 “Licensed Method” means any method that is claimed in Patent Rights (as defined below), the use of which in or for the Field would constitute, but for the license granted to LICENSEE under this Agreement, an infringement, an inducement to infringe or contributory infringement, of any Valid Claim within Patent Rights.

1.11 “Licensed Product” means any service, material, composition or product, or any product that uses Technology, or that is claimed in Patent Rights, or that is produced by the Licensed Method, or the manufacture, use, sale, offer for sale, or importation of which in each case of the foregoing, in or for the Field, would constitute, but for the license granted to LICENSEE under this Agreement, an infringement, an inducement to infringe

or contributory infringement, of any Valid Claim within the Patent Rights, provided that Licensed Product shall not include an ADC Product or a Bispecific Product.

1.12 "Naked Antibody" means an Antibody that is used in unmodified form and is not conjugated or fused with another chemical or biological entity covered by the Patent Rights.

1.13 "Net Sales" means the total of the gross invoice prices of Licensed Products sold or leased by LICENSEE, Sublicensee, Affiliate, or any combination thereof, less the sum of the following actual and customary deductions where applicable and separately listed: cash, trade, or quantity discounts or rebates (as allowed under applicable law); sales tax, use tax, tariff, import/export duties or other excise taxes imposed on particular sales (except for value-added and income taxes imposed on the sales of Licensed Product in foreign countries); transportation charges; or credits to customers because of rejections, returns or recalls of Licensed Products or because of rebates or charge-backs. For purposes of calculating Net Sales, transfers to a Sublicensee or an Affiliate of Licensed Product under this Agreement for (i) end use (but not resale) by the Sublicensee or Affiliate shall be treated as sales by LICENSEE at list price of LICENSEE, or (ii) resale by a Sublicensee or an Affiliate shall be treated as sales at the list price of the Sublicensee or Affiliate.

1.14 "Patent Costs" means all out-of-pocket expenses for the preparation, filing, prosecution, and maintenance of all United States and foreign patents included in Patent Rights. Patent Costs shall also include out-of-pocket expenses for patentability opinions, inventorship determination, preparation and prosecution of patent application, re-examination, re-issue, interference, and opposition activities related to patents or applications in Patent Rights.

1.15 "Patent Rights" means UNIVERSITY's rights in any of the following: (i) the patents and patent applications listed in Exhibit C attached hereto, (ii) all continuing applications of any of the foregoing, including divisions, substitutions, and continuations-in-part (but only to the extent the claims thereof are entirely supported in the specification and entitled to the priority date of the parent application), (iii) all patents issuing on any of the foregoing applications including reissues, reexaminations and extensions, and (iv) all corresponding foreign applications or patents of any of the foregoing.

1.16 "Sponsor's Rights" means all the applicable provisions of any license to the United States Government executed by UNIVERSITY and the overriding obligations to the US Government under 35 U.S.C. §§ 200-212 and the overriding obligations to Sponsors under the sponsorship agreements with the same.

1.17 "Sublicense" means an agreement into which LICENSEE enters with a third party that is not an Affiliate for the purpose of (i) granting certain rights; (ii) granting an option to certain rights; or (iii) forbearing the exercise of any rights, granted to LICENSEE under this Agreement. "Sublicensee" means a third party with whom LICENSEE enters into a Sublicense.

1.18 "Technology" means all relevant written technical information relating to the Inventions, which the Inventors may provide to LICENSEE prior to the Effective Date, and (b) all technical information, regulatory filings related to the Inventions developed prior to the Effective Date.

1.19 "Term" means the period of time beginning on the Effective Date and ending on the later of (i) the expiration date of the longest-lived Patent Rights; or (ii) the fifteenth anniversary of the first commercial sale of Licensed Product.

1.20 "Territory" means world-wide where Patent Rights exist to the extent this license may legally be granted.

1.21 "Upstream University Agreements" means any agreement entered into by and between UNIVERSITY and one or more third parties under which UNIVERSITY has agreed, either on behalf of itself or any licensee or sublicensee of UNIVERSITY, to pay, or to cause its licensee or sublicensee to pay, any upfront payments, royalties, maintenance fees, milestone payments or other consideration in connection with the practice or use of the Licensed Patents or the Technology or the research, development, manufacture or commercialization of any Licensed Products, including without limitation, the Biosite Agreement as well as any agreement entered into by UNIVERSITY or LICENSEE with Xoma Technology Ltd., or any successor-in-interest thereto, as contemplated in the Biosite Agreement.

1.22 "Valid Claim" means any claim (a) issued in an unexpired patent which has not been held unenforceable, unpatentable or invalid by a decision of a court or other governmental agency of competent jurisdiction in the Territory following exhaustion of all possible appeal processes, and which has not been admitted to be invalid or unenforceable through reissue, re-examination or disclaimer or (b) of a patent application pending, so long as at least one claim covering a Licensed Product in such patent application is being diligently prosecuted in the Territory.

ARTICLE 2. GRANT

2.1 **License**. Subject to the limitations set forth in this Agreement and Sponsor's Rights, UNIVERSITY hereby grants to LICENSEE, and LICENSEE hereby accepts, a license under Patent Rights to make and have made, to use and have used, to sell and have sold, to offer for sale, and to import and have imported Licensed Products and to practice Licensed Methods and to use Technology in the Field within the Territory and during the Term.

The license granted herein is (a) non-exclusive for US Patent No. 8,212,009 in the field of flow cytometry and imaging-based reagent sales; (b) co-exclusive (with other licensees of the Patent Rights) for the use of the Naked Antibody in a diagnostic application, the use of a Naked Antibody as an experimental control with respect to Licensed Products, and the use of a Naked Antibody as a framework for the Field; and (c) exclusive for all therapeutic uses and other remaining Patent Rights in the Field.

2.2 **Sublicense**.

(a) The license granted in Paragraph 2.1 includes the right of LICENSEE to grant Sublicenses to Affiliates or third parties during the Term but only for as long as the license is exclusive (except in the case of US Patent No. 8,212,009 where the Agreement is nonexclusive). If at any time an Affiliate no longer qualifies as an Affiliate under this Agreement, then any sublicense to the former Affiliate has to satisfy the requirements of paragraph 2.2(b).

(b) With respect to Sublicense granted to third parties pursuant to Paragraph 2.2(a), LICENSEE shall:

(i) not receive, or agree to receive, anything of value in lieu of cash as consideration from a third party under a Sublicense granted pursuant to Paragraph 2.2(a) without the express written consent of UNIVERSITY;

(ii) to the extent applicable, include all of the rights of and obligations due to UNIVERSITY (and, if applicable, the Sponsor's Rights) and contained in this Agreement;

(iii) promptly provide UNIVERSITY with a copy of each Sublicense issued; and

(iv) collect and guarantee payment of all payments due, directly or indirectly, to UNIVERSITY from Sublicensees and summarize and deliver all reports due, directly or indirectly, to UNIVERSITY from Sublicensees.

(c) Upon termination of this Agreement for any reason, UNIVERSITY, at its sole discretion, shall determine whether LICENSEE shall cancel or assign to UNIVERSITY any and all Sublicenses.

2.3 **Reservation of Rights**. UNIVERSITY reserves the right to:

(a) use the Inventions, Technology and Patent Rights for educational and research purposes;

(b) publish or otherwise disseminate any information about the Inventions and Technology at any time; and

(c) allow other nonprofit institutions to use and publish or otherwise disseminate any information about Inventions, Technology and Patent Rights for educational and research purposes.

2.4 **Upstream University Agreements**. To the extent of the actual knowledge of the licensing professional managing the Inventions, the Upstream University Agreements are in full force and effect. LICENSEE agrees to abide by the obligations set forth in EXHIBIT D which have been excerpted from the Biosite Agreement.

ARTICLE 3. CONSIDERATION

3.1 **Fees and Royalties**. The parties hereto understand that the fees and royalties payable by LICENSEE to UNIVERSITY under this Agreement are partial consideration for the license granted herein to LICENSEE under Technology and Patent Rights. LICENSEE shall pay UNIVERSITY:

(a) University acknowledges and agrees that a license issue fee of five hundred thousand dollars (US$500,000) was timely paid by LICENSEE; and additional consideration in the form of 1,250,000 shares (5%) of the LICENSEE's common stock authorized in the Articles/ Certificate of Incorporation of the LICENSEE dated December 21, 2015, a copy of which is attached to this Agreement as Exhibit B, was delivered to UNIVERSITY.

(b) license maintenance fees of twenty-five thousand dollars (US$25,000) per year and payable on the first anniversary of the Effective Date and annually thereafter on each anniversary; provided however, that LICENSEE's obligation to pay this fee shall end on the date when LICENSEE is commercially selling a Licensed Product;

(c) a license restatement fee of twenty-five thousand dollars (US$25,000) payable within thirty (30) days after the Effective Date;

(d) milestone payments in the amounts noted below and payable within thirty (30) days of the occurrence, according to the following schedule or events:

A. For the first Antibody Licensed Product:

Event	Amount
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]

B. For the first Genetically Engineered Cellular Therapy or CAR-T Licensed Product:

Event	Amount
[***]	[***]
[***]	[***]
[***]	[***]

[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]

C. Sales Milestones for all Licensed Products:

LICENSEE shall pay UNIVERSITY sales milestones upon the cumulative Net Sales of all Licensed Products according to the following schedule:

(i)	Of at least [***]	[***]
(ii)	Of at least [***]	[***]
(iii)	Of at least [***]	[***]
(iv)	Of at least [***]	[***]
(v)	Of at least [***]	[***]

provided, however, that in no event will any milestone set forth in this Agreement be due more than once.

(e) an earned royalty of [***] on Net Sales of Antibody Licensed Products by LICENSEE and/or its Affiliate(s); an earned royalty of [***] on Net Sales of Genetically Engineered Cellular Therapy or CAR-T Licensed Products by LICENSEE and/or its Affiliate(s);

provided, however, that no more than one earned royalty shall be due under this Agreement with respect to the sale of any Licensed Product; and

provided, further, that the earned royalty due on Net Sales of Combination Product by LICENSEE and/or its Affiliate(s) shall be calculated as below:

Earned Royalties due UNIVERSITY = [A/(A+B)] x royalty rate on Net Sales of the Licensed Products x Net Sales of Combination Product, where:

A is the separately listed sale price of the Licensed Product; and

B is the separately listed sale prices of the individual products that satisfy the requirements outlined in Paragraph 1.8 (“Combination Products”). In no event shall the amount payable to UNIVERSITY be less than [***] of the amount otherwise due.

For any products in B for which LICENSEE has reduced its earned royalties payable to UNIVERSITY under Paragraph 3.l(f) or (g), this provision shall not apply.

(f) In the event of (i) expiration of applicable Patent Rights to a Licensed Product while use of Technology still applies, and/or (ii) a Licensed Product is indicated for use

in combination with another pharmaceutical product, the earned royalty shall be reduced by [***]. If LICENSEE has reduced its earned royalties payable to UNIVERSITY under Paragraph 3.1(e) or (g), this provision shall not apply.

(g) In the event LICENSEE is required to pay royalties or milestones to one or more third parties for patent or technology rights necessary to make, use or sell Licensed Products, LICENSEE may deduct [***] from the earned royalties payable to UNIVERSITY for every [***] LICENSEE actually pays to said third parties provided, however, except as otherwise set forth herein, in no event shall the amount payable to UNIVERSITY be less than [***] of the amount otherwise due. If LICENSEE has reduced its earned royalties payable to UNIVERSITY under Paragraph 3.1(e) or (f), this provision shall not apply.

(h) Sublicense Fees (defined below) received by LICENSEE from its Sublicensees that are not earned royalties according to the following schedule:

Development stage of Licensed Product	Percent of Sublicense Fee
Prior to the initiation of the first Phase II clinical trial for the Antibody Licensed Product	[***]
Prior to the initiation of the first Phase II clinical trial with respect to any Licensed Product (with the exception to the Antibody Licensed Product)	[***]
After initiation of the first Phase II clinical trial but prior to regulatory approval for any Licensed Product	[***]
After regulatory approval for any Licensed Product	[***]

"Sublicense Fees" means all upfront fees, milestone payments and similar license fees received by LICENSEE from its Sublicensees in consideration for the grant of a Sublicense for Patent Rights and Technology, but excluding:

(i) any royalty payments or other share of net sales (including revenue sharing, profit payments that would otherwise be reflected in Net Sales) on the sale or distribution of Licensed Products or services using Licensed Products;

(ii) payments for equity or debt securities of LICENSEE (except to the extent such payments exceed the fair market value of such securities upon date of receipt, in which case such premiums over fair market value shall be deemed to be "Sublicense Revenue");

(iii) research or development funding explicitly earmarked to be applied directly to the future research and/or development of Licensed Products and/or Licensed Services;

(iv) amounts payed by a Sublicensee for supply of goods from LICENSEE related to the Licensed Products; and

(v) payments and reimbursement of Patent Costs previously paid to UNIVERSITY by LICENSEE with respect to the filing, preparation, prosecution or maintenance of the Patent Rights.

(i) on each and every Sublicense royalty payment received by LICENSEE from its Sublicensees on sales of Licensed Product by Sublicensee royalties based on the royalty rate in Paragraphs 3.1(e) through (g) as applied to Net Sales;

(j) beginning the calendar year of commercial sales of the first Licensed Product by LICENSEE, its Sublicensee, or an Affiliate and if the total earned royalties paid by LICENSEE under Paragraphs 3.1(e) through (g) to UNIVERSITY in any such year cumulatively amounts to less than the amounts in the schedule below:

Year 1: [***]
Year 2: [***]
Year 3: [***]
Year 4-5: [***]
Year 6 and beyond: [***]

("minimum annual royalty"), LICENSEE shall pay to UNIVERSITY a minimum annual royalty on or before February 28 following the last quarter of such year the difference between amount noted above and the total earned royalty paid by LICENSEE for such year under Paragraphs 3.1(e) through (g); provided, however, that for the year of commercial sales of the first Licensed Product, the amount of minimum annual royalty payable shall be pro-rated for the number of months remaining in that calendar year.

All fees and royalty payments specified in Paragraphs 3.1(a) through 3.1(j) above shall be paid by LICENSEE pursuant to Paragraph 4.3 and shall be delivered by LICENSEE to UNIVERSITY as noted in Paragraph 10.1.

3.2 **Patent Costs**. LICENSEE shall reimburse UNIVERSITY all past (prior to the Effective Date) and future (on or after the Effective Date) Patent Costs within thirty (30) days following the date an itemized invoice is sent from UNIVERSITY to LICENSEE. In UNIVERSITY's discretion, for Patent Costs anticipated to exceed [***] ("Anticipated Costs"), UNIVERSITY will inform LICENSEE no less than sixty (60) days prior to the date when Anticipated Costs are incurred. UNIVERSITY may, at its discretion and in accordance with Paragraph 5.l(c), require full advance payment of Anticipated Costs at least fifteen (15) business days before required filing dates ("Advance Payment Deadline"). In the event UNIVERSITY has provided LICENSEE with a sixty (60) days' notice of Anticipated Costs, and LICENSEE does not pay the Anticipated Costs on or

before the Advance Payment Deadline, UNIVERSITY will act at its sole discretion with regard to filing, prosecution and maintenance of those Patent Rights associated with the sixty (60) days' notice. In the event that the Anticipated Costs paid by LICENSEE is greater than the actual cost, the excess amount is creditable against future Patent Costs. In the event that the actual costs exceed the Anticipated Costs paid in advance by LICENSEE, LICENSEE shall pay such excess costs within thirty (30) days following the date an itemized invoice is sent as set forth in Paragraph 4.3.

In the event that UNIVERSITY licenses Patent Rights to a third party ("Additional Licensee"), UNIVERSITY shall cause any Additional Licensee to pay a pro-rata share of future Patent Costs after the execution date of the Additional Licensee's license. For purposes if this Paragraph 3.2, "pro-rata" shall mean a fractional share of the total Patent Costs multiplied by a fraction, the numerator of which is one and the denominator of which is the Additional Licensee plus one.

3.3 **Due Diligence**.

(a) LICENSEEshall, either directly or through its Affiliate(s) or Sublicensee(s):

(i) diligently proceed with the development, manufacture and sale of Licensed Products;

(ii) annually spend not less than [***] for the development of Licensed Products during the first five (5) years of this Agreement. LICENSEE recognizes the expertise of the Inventors in Inventions and, pursuant to Paragraph 3.4 below, is committed to contract the Inventors to further develop Inventions at UCSD of at least [***] per year for a total of five years. LICENSEE may credit the amount actually paid to UCSD under such contract against its obligation under this paragraph;

(iii) market Licensed Products in the United States within nine (9) months of receiving regulatory approval to market such Licensed Products;

(iv) fill the market demand for Licensed Products following commencement of marketing at any time during the term of this Agreement; and

(v) obtain all necessary governmental approvals for the manufacture, use and sale of Licensed Products.

A. First Antibody Licensed Product - UC99961/UC-961/ Cirmtuzumab

(i) open IND and initiate Phase I clinical trial for Licensed Product within one (1) year from the Effective Date;

(ii) dose the first patient in the first Phase II clinical trial for Licensed Product within three (3) years from the Effective Date;

(iii) dose the first patient in the first Phase I/Phase II clinical trial in ovarian and/or breast cancer with Licensed Product within three (3) years from the Effective Date;

(iv) complete first end of Phase II meeting with FDA for Licensed Product within three and one half (3.5) years from the Effective Date;

(v) dose first patient in the first Phase II clinical trial in ovarian or breast cancer for Licensed Product within four (4) years from the Effective Date;

(vi) dose first patient in the first Phase III clinical trial for Licensed Product within five and one half (5.5) years from the Effective Date;

(vii) complete enrollment of the first Phase III clinical trial for Licensed Product within seven (7) years from the Effective Date;

(viii) submit the first NDA for the Licensed Product to the United States FDA within eight (8) years from the Effective Date;

(ix) dose first patient in each Phase III clinical trial for Licensed Product in ovarian or breast cancer within six (6) years form the Effective Date; and

(x) LICENSEE will provide additional diligence for the development of Licensed Products within three (3) years from the Effective Date.

B. First Genetically Engineered Cellular Therapy or CAR-T Licensed Product

(i) Initiate IND-enabling toxicology studies for Licensed Product within three (3) years from the Effective Date;

(ii) File the first IND for Licensed Product within four (4) years from the Effective Date;

(iii) Initiate the first Phase I clinical trial for Licensed Product within four and one half (4.5) years from the Effective Date;

(iv) Dose first patient in first Phase II clinical trial for Licensed Product within six (6) years from the Effective Date;

(v) Conduct end of Phase II meeting with the FDA for Licensed Product within seven (7) years from the Effective Date; and

(vi) LICENSEE will provide additional diligence for the development of Genetically Engineered Cellular Therapy or CAR-T Licensed Products within four (4) years from the Effective Date;

(b) If LICENSEE fails to perform any of its obligations specified in Paragraph 3.3(a) in any Licensed Product category (e.g. Antibody Licensed Product or Genetically Engineered Cellular Therapy or CAR-T Licensed Product), then UNIVERSITY shall have the right and option, if LICENSEE fails to cure such breach or provide an acceptable plan of action to cure such breach, to either terminate this Agreement or change LICENSEE's exclusive license to a nonexclusive license with respect to such Licensed Product category. This right, if exercised by UNIVERSITY, supersedes the rights granted in Article 2.

The deadlines for the diligence milestones set forth in Paragraph 3.3(a) above shall be extended by the length of any delay caused by a regulatory authority where such delay by the regulatory authority was not the result of the LICENSEE's actions or inactions and was not the result of the LICENSEE's failure to abide by the regulatory authority's instructions or LICENSEE's failure to provide data to the regulatory authority in the form and manner required by such regulatory authority.

In the event of delays due to efficacy and/or safety of Licensed Products and beyond the control of LICENSEE, LICENSEE and UNIVERSITY shall discuss in good faith extensions of the time-lines presented in Paragraph 3.3(a) above.

3.4 **Research Support**. LICENSEE agrees to provide research support to Inventors to further develop the Inventions at UCSD in the amount of not less than five hundred thousand dollars (US$500,000) in the aggregate per year for five (5) years under sponsored research agreements ("Sponsored Research Agreements") to be negotiated by LICENSEE with the UCSD Office of Contract and Grant Administration. In consideration of the foregoing, LICENSEE shall enter into a Sponsored Research Agreement conducted under the direction of Dr. Thomas Kipps, MD within thirty (30) days of the Effective Date. All amounts paid by LICENSEE to UNIVERSITY under the Sponsored Research Agreement shall cumulatively count towards LICENSEE's annual spend obligation under Article 3.3(a)(ii).

In addition, and to the extent such financial support is required by CIRM, LICENSEE agrees to provide support for up to [***] of the costs of the CIRM-funded clinical trial of UC-961 up to [***] year (prorated for any partial year that the clinical trial grant is in effect), under a Clinical Trials Agreement which will be executed within forty-five (45) days from the Effective Date.

ARTICLE 4. REPORTS, RECORDS AND PAYMENTS

4.1 **Reports**.

(a) **Progress Reports**.

Beginning six months after the Effective Date and ending on the date of first commercial sale of a Licensed Product in the United States, LICENSEE shall report to UNIVERSITY progress covering LICENSEE's (and Affiliate's and Sublicensee's) activities for the preceding six months to develop and test all Licensed Products and obtain governmental

approvals necessary for marketing the same. Such semiannual reports shall be due within sixty (60) days of the reporting period and include a summary of work completed, summary of work in progress, current schedule of anticipated events or milestones, market plans for introduction of Licensed Products, and summary of resources (dollar value) spent in the reporting period. The reports referred to in this Paragraph 4.1(a) should be marked with the following title and case number: “License Agreement between UCSD and Oncternal Therapeutics, Inc. for case SD2012-143.” Reports shall be submitted as attachment to UCSD’s email address: oic-reports@ucsd.edu.

(b) **Royalty Reports**.

After the first commercial sale of a Licensed Product anywhere in the world, LICENSEE shall submit to UNIVERSITY quarterly royalty reports on or before each February 28, May 31, August 31 and November 30 of each year. Each royalty report shall cover LICENSEE’s (and each Affiliate’s and Sublicensee’s) most recently completed calendar quarter and shall show:

(i) the date of first commercial sale of a Licensed Product in each country;

(ii) the gross sales, deductions as provided in Paragraph 1.12 (Net Sales), and Net Sales during the most recently completed calendar quarter and the royalties, in US dollars, payable with respect thereto;

(iii) the number of each type of Licensed Product sold;

(iv) Sublicense fees and royalties received during the most recently completed calendar quarter in US dollars, payable with respect thereto;

(v) the method used to calculate the royalties; and

(vi) the exchange rates used.

If no sales of Licensed Products have been made and no Sublicense revenue has been received by LICENSEE during any reporting period, LICENSEE shall so report. The reports referred to in this Paragraph 4.1(b) should be marked with the following title and case number: “License Agreement between UCSD and Oncternal Therapeutics, Inc. for case SD2015-143.” Reports shall be submitted as attachment to UCSD’s email address: oic-reports@ucsd.edu.

(c) **Timely Reports**.

LICENSEE acknowledges the important value that timely reporting provides in the UNIVERSITY’s effective management of its rights under this Agreement. LICENSEE further acknowledges that failure to render the reports required under this Paragraph 4.1 may harm UNIVERSITY’s ability to manage its rights under this Agreement. As such, reports not submitted by the required due date under this Paragraph 4.1 will cause to be due by LICENSEE to UNIVERSITY a late reporting fee of five hundred dollars (US$500.00) per month until such report, compliant with the requirements of this

Paragraph 4.1, is received by UNIVERSITY. Payment of this fee is subject to Paragraph 4.3 and Paragraph 10.1 herein.

4.2 **Records & Audits**.

(a) LICENSEE shall keep, and shall require its Affiliates and Sublicensees to keep, accurate and correct records of all Licensed Products manufactured, used, and sold, and Sublicense fees received under this Agreement. Such records shall be retained by LICENSEE for at least five (5) years following a given reporting period.

(b) All records shall be available during normal business hours for inspection at the expense of UNIVERSITY by UNIVERSITY's Internal Audit Department or by a Certified Public Accountant selected by UNIVERSITY and reasonably acceptable to LICENSEE and in compliance with the other terms of this Agreement for the sole purpose of verifying reports and payments or other compliance issues no more than one time for each annual period. If LICENSEE rejects three choices of CPAs suggested by UNIVERSITY, then UNIVERSITY may choose a CPA without concurrence by LICENSEE. Such inspector shall not disclose to UNIVERSITY any information other than information relating to the accuracy of reports and payments made under this Agreement or other compliance issues. In the event that any such inspection shows an under reporting and underpayment in excess of [***] for any twelve-month (12-month) period, then LICENSEE shall pay the cost of the audit as well as any additional sum that would have been payable to UNIVERSITY had the LICENSEE reported correctly, plus an interest charge at a rate of [***] per year. Such interest shall be calculated from the date the correct payment was due to UNIVERSITY up to the date when such payment is actually made by LICENSEE. For underpayment not in excess of [***] for any twelve-month (12-month) period, LICENSEE shall pay the difference within thirty (30) days without interest charge or inspection cost.

4.3 **Payments**.

(a) All fees, reimbursements and royalties due UNIVERSITY shall be paid in United States dollars and all checks (should payment by wire not be possible) shall be made payable to "The Regents of the University of California", referencing UNIVERSITY's taxpayer identification number, 95-6006144, and sent to UNIVERSITY according to Paragraph 10.l (Correspondence). When Licensed Products are sold in currencies other than United States dollars, LICENSEE shall first determine the earned royalty in the currency of the country in which Licensed Products were sold and then convert the amount into equivalent United States funds, using the average of the exchange rate quoted in the Wall Street Journal for the thirty (30) days prior to the end of the applicable reporting period.

(b) **Royalty Payments**.

(i) Royalties shall accrue when Licensed Products are invoiced, or if not invoiced, when delivered to a third party or Affiliate.

(ii) LICENSEE shall pay earned royalties quarterly on or before February 28, May 31, August 31 and November 30 of each calendar year. Each such payment shall be for earned royalties accrued within LICENSEE's most recently completed calendar quarter.

(iii) Royalties earned on sales occurring or under Sublicense granted pursuant to this Agreement in any country outside the United States shall not be reduced by LICENSEE for any taxes, fees, or other charges imposed by the government of such country on the payment of royalty income, except that all payments made by LICENSEE in fulfillment of University's tax liability in any particular country may be credited against earned royalties or fees due UNIVERSITY for that country. LICENSEE shall pay all bank charges resulting from the transfer of such royalty payments.

(iv) If at any time legal restrictions prevent the prompt remittance of part or all royalties by LICENSEE with respect to any country where a Licensed Product is sold or a Sublicense is granted pursuant to this Agreement, LICENSEE shall convert the amount owed to UNIVERSITY into US currency and shall pay UNIVERSITY directly from its US sources of funds for as long as the legal restrictions apply.

(v) LICENSEE shall not collect royalties from, or cause to be paid on Licensed Products sold to the account of the US Government or any agency thereof as provided for in the license to the US Government.

(vi) In the event that any patent or patent claim within Patent Rights is held invalid in a final decision by a patent office from which no appeal or additional patent prosecution has been or can be taken, or by a court of competent jurisdiction and last resort and from which no appeal has or can be taken, all obligation to pay royalties based solely on that patent or claim or any claim patentably indistinct therefrom shall cease as of the date of such final decision. LICENSEE shall not, however, be relieved from paying any royalties that accrued before the date of such final decision, that are based on another patent or claim not involved in such final decision.

(vii) Royalty payments under Article 3, recoveries and settlements under Article 5, and royalty reports under 4.l(b) shall be rendered for any and all Licensed Products even if due after expiration of the Agreement. If no applicable Patent Rights existed in the Territory at the time of any making, use, sale, offer for sale, or import, then no royalty payments or royalty reports shall be due.

(c) Late Payments. In the event royalty, reimbursement and/or fee payments are not received by UNIVERSITY when due, LICENSEE shall pay to UNIVERSITY interest charges at a rate of [***] per year. Such interest shall be calculated from the date payment was due until actually received by UNIVERSITY.

ARTICLE 5. PATENT MATTERS

5.1 **Patent Prosecution and Maintenance**.

(a) Provided that LICENSEE has reimbursed UNIVERSITY for Patent Costs pursuant to Paragraph 3.2, UNIVERSITY shall diligently prosecute and maintain the United States and, if available, foreign patents, and applications in Patent Rights using counsel of its choice. UNIVERSITY shall provide LICENSEE with copies of all relevant documentation relating to such prosecution to allow for review and comment by LICENSEE, including discussion among relevant entities (i.e. entities with interests in the Patent Rights) to the extent appropriate. UNIVERSITY shall reasonably consider all such comments, provided, however, if the LICENSEE has not commented upon such documentation in a reasonable time for UNIVERSITY to sufficiently consider LICENSEE's comments prior to a deadline with the relevant government patent office, or UNIVERSITY must act to preserve the Patent Rights, UNIVERSITY will be free to respond without consideration of LICENSEE's comments, if any. LICENSEE shall keep this documentation confidential. The counsel shall take instructions only from UNIVERSITY, and all patents and patent applications in Patent Rights shall be assigned solely to UNIVERSITY. UNIVERSITY shall in any event control all patent filings and all patent prosecution decisions and related filings (e.g. responses to office actions) shall be at UNIVERSITY's final discretion (prosecution includes, but is not limited to, interferences, oppositions and any other *inter partes* matters originating in a patent office).

(b) UNIVERSITY shall consider amending any patent application in Patent Rights to include claims reasonably requested by LICENSEE to protect the products contemplated to be sold by LICENSEE under this Agreement.

(c) LICENSEE may elect to terminate its reimbursement obligations with respect to any patent application or patent in Patent Rights upon three (3) months' written notice to UNIVERSITY. UNIVERSITY shall use reasonable efforts to curtail further Patent Costs for such application or patent when such notice of termination is received from LICENSEE. UNIVERSITY, in its sole discretion and at its sole expense, may continue prosecution and maintenance of said application or patent, and LICENSEE shall have no further license with respect thereto. Non-payment of any portion of Patent Costs or Anticipated Costs with respect to any application or patent may be deemed by UNIVERSITY as an election by LICENSEE to terminate its reimbursement obligations with respect to such application or patent. UNIVERSITY is not obligated at any time to file, prosecute, or maintain Patent Rights in a country, where, for that country's patent application LICENSEE is not paying Patent Costs or Anticipated Costs, or to file, prosecute, or maintain Patent Rights to which LICENSEE has terminated its license hereunder.

(d) LICENSEE shall apply for an extension of the term of any patent in Patent Rights if appropriate under the Drug Price Competition and Patent Term Restoration Act of 1984 and/or European, Japanese and other foreign counterparts of this law. LICENSEE shall prepare all documents for such application, and, if requested by LICENSEE,

UNIVERSITY shall execute such documents and take any other additional action as LICENSEE reasonably requests in connection therewith.

5.2 **Patent Infringement**.

(a) In the event that UNIVERSITY (to the extent of the actual knowledge of the licensing professional responsible for the administration of this Invention) or LICENSEE learns of infringement of potential commercial significance of any patent licensed under this Agreement, the knowledgeable party will provide the other (i) with written notice of such infringement and (ii) with any evidence of such infringement available to it (the "Infringement Notice"). During the period in which, and in the jurisdiction where, LICENSEE has exclusive rights under this Agreement, neither UNIVERSITY nor LICENSEE will notify a third party (including the infringer) of infringement or put such third party on notice of the existence of any Patent Rights without first obtaining consent of the other. If LICENSEE notifies a third party of infringement or puts such third party on notice of the existence of any Patent Rights with respect to such infringement without first obtaining the written consent of UNIVERSITY and UNIVERSITY is sued in declaratory judgment, UNIVERSITY shall have the right to terminate this Agreement immediately without the obligation to provide sixty (60) days' notice as set forth in Paragraph 7.1. Both UNIVERSITY and LICENSEE will use their diligent efforts to cooperate with each other to terminate such infringement without litigation.

For the avoidance of doubt, this paragraph 5.2(a) does not prevent LICENSEE or UNIVERSITY from consulting its counsel or insurance providers or prevents LICENSEE from patent marking according to paragraph 5.3.

(b) If infringing activity of potential commercial significance with respect to the Field by the infringer has not been abated within ninety (90) days following the date the Infringement Notice takes effect, LICENSEE may institute suit for patent infringement against the infringer. UNIVERSITY may voluntarily join such suit at its own expense, but may not thereafter commence suit against the infringer for the acts of infringement that are the subject of LICENSEE's suit or any judgment rendered in that suit. LICENSEE may not join UNIVERSITY in a suit initiated by LICENSEE without UNIVERSITY'S prior written consent. If, in a suit initiated by LICENSEE, UNIVERSITY is involuntarily joined other than by LICENSEE, LICENSEE will pay any costs incurred by UNIVERSITY arising out of such suit, including but not limited to, any legal fees of counsel that UNIVERSITY selects and retains to represent it in the suit.

(c) If, within a hundred and twenty (120) days following the date the Infringement Notice takes effect, infringing activity of potential commercial significance with respect to the Field by the infringer has not been abated and if LICENSEE has not brought suit against the infringer, UNIVERSITY may institute suit for patent infringement against the infringer. If UNIVERSITY institutes such suit, LICENSEE may not join such suit without UNIVERSITY'S consent and may not thereafter commence suit against the infringer for the acts of infringement that are the subject of UNIVERSITY'S suit or any judgment rendered in that suit.

(d) Notwithstanding anything to the contrary in this Agreement, in the event that the infringement or potential infringement pertains to an issued patent included within the Patent Rights and written notice is given under any statute expediting litigation (e.g. the Drug Price Competition and Patent Term Restoration Act of 1984 and/or foreign counterparts of this Law or the Biologics Price Competition and Innovation Act) ("Act"), then the party in receipt of such notice under the Act (in the case of UNIVERSITY to the extent of the actual knowledge of the licensing officer responsible for the administration of this Agreement) shall provide the Infringement Notice to the other party promptly. If the time period is such that the LICENSEE will lose the right to pursue legal remedy for infringement with respect to the Field by not notifying a third party or by not filing suit, the notification period and the time period to file suit will be accelerated to within forty-five (45) days of the date of such notice under the Act to either party.

(e) Any recovery or settlement received in connection with any suit will first be shared by UNIVERSITY and LICENSEE equally to cover the litigation costs each incurred, and next shall be paid to UNIVERSITY or LICENSEE to cover any litigation costs it incurred in excess of the litigation costs of the other. In any suit initiated by LICENSEE, any recovery in excess of litigation costs will be shared between LICENSEE and UNIVERSITY as follows: (i) for any recovery other than amounts paid for willful infringement: (A) UNIVERSITY will receive [***] of the recovery if UNIVERSITY was not a party in the litigation and did not incur any litigation costs; (B) UNIVERSITY will receive [***] of the recovery if UNIVERSITY was a party in the litigation, but did not incur any litigation costs, including the provisions of Paragraph 5.2(b) above, or (C) UNIVERSITY will receive [***] of the recovery if UNIVERSITY incurred any unreimbursed litigation costs in connection with the litigation; and (ii) for any recovery for willful infringement, UNIVERSITY will receive [***] of the recovery. In any suit initiated by UNIVERSITY, any recovery in excess of the litigation costs for UNIVERSITY AND LICENSEE will belong to UNIVERSITY. UNIVERSITY and LICENSEE agree to be bound by all final and unappealable determinations of patent infringement, validity, and enforceability (but no other issue) resolved by any adjudicated judgment in a suit brought in compliance with this Paragraph 5.2.

(f) Any agreement made by LICENSEE for purposes of settling litigation or other dispute shall comply with the requirements of Paragraph 2.2 (Sublicenses) of this Agreement.

(g) Each party will cooperate with the other in litigation proceedings instituted hereunder but at the expense of the party who initiated the suit (unless such suit is being jointly prosecuted by the parties).

(h) Any litigation proceedings will be controlled by the party bringing the suit, except that UNIVERSITY may be represented by counsel of its choice in any suit brought by LICENSEE.

5.3 **Patent Marking**. LICENSEE shall mark all Licensed Products made, used or sold under the terms of this Agreement, or their containers, in accordance with the applicable patent marking laws. LICENSEE shall be responsible for all monetary and legal liabilities

arising from or caused by (i) failure to abide by applicable patent marking laws and (ii) any type of incorrect or improper patent marking.

ARTICLE 6. GOVERNMENTAL MATTERS

6.1 **Governmental Approval or Registration**. If this Agreement or any associated transaction is required by the law of any nation to be either approved or registered with any governmental agency, LICENSEE shall assume all legal obligations to do so. LICENSEE shall notify UNIVERSITY if it becomes aware that this Agreement is subject to a United States or foreign government reporting or approval requirement. LICENSEE shall make all necessary filings and pay all costs including fees, penalties, and all other out-of-pocket costs associated with such reporting or approval process.

6.2 **Export Control Laws**. LICENSEE shall observe all applicable United States and foreign laws with respect to the transfer of Licensed Products and related technical data to foreign countries, including, without limitation, the International Traffic in Arms Regulations and the Export Administration Regulations.

6.3 **Preference for United States Industry**. If LICENSEE sells a Licensed Product or Combination Product in the US, LICENSEE shall manufacture said product substantially in the US to the extent required by applicable law, unless a waiver is obtained from the appropriate federal agency.

6.4 **Access Requirements**. To the extent required by applicable law, unless a waiver is obtained from the appropriate agency, LICENSEE shall submit an access plan to CIRM within ten (10) days following final approval of Licensed Product by the FDA. The plan must afford access to Licensed Product to Californians who have no other means to purchase the Licensed Product (Title 17, California Code of Regulations, section 100607, Exhibit A, “Access Requirements for Products Developed by Grantees”).

6.5 **March-In Rights**. To the extent required by applicable law, unless a waiver is obtained from the appropriate agency, CIRM may request LICENSEE enter into a license agreement with respect to Licensed Product in any field of use or territory with a responsible applicant or applicants, upon terms that are reasonable under the circumstances (Title 17, California Code of Regulations, section 100610, Exhibit A, “March-In Rights”).

ARTICLE 7. TERMINATION OR EXPIRATION OF THE AGREEMENT

7.1 **Termination by UNIVERSITY**.

(a) If LICENSEE fails to perform or violates any material term of this Agreement, then UNIVERSITY may give written notice of default (“Notice of Default”) to LICENSEE. If LICENSEE fails to cure the default or fails to provide UNIVERSITY with a reasonable plan of action to cure such default, UNIVERSITY may terminate this Agreement and the license granted herein by a second written notice (“Notice of Termination”) to LICENSEE. If a Notice of Termination is sent to LICENSEE, this Agreement shall automatically terminate on the effective date of that notice. Termination

shall not relieve LICENSEE of its obligation to pay any fees owed at the time of termination and shall not impair any accrued right of UNIVERSITY. During the term of any such Notice of Default or period to cure, to the extent the default at issue is a failure to pay past or ongoing Patent Costs as provided for under this Agreement, UNIVERSITY shall have no obligation to incur any new Patent Costs under this Agreement and shall have no obligation to further prosecute Patent Rights or file any new patents under Patent Rights.

(b) This Agreement will terminate immediately, without the obligation to provide sixty (60) days' notice as set forth in Paragraph 7.l(a), if LICENSEE files a claim asserting that any portion of UNIVERSITY's Patent Rights is invalid or unenforceable where the filing is by the LICENSEE, a third party on behalf of the LICENSEE, or a third party at the written urging of the LICENSEE.

(c) This Agreement shall automatically terminate without the obligation to provide sixty (60) days' notice as set forth in Paragraph 7.1(a) upon the filing of a petition for relief under the United States Bankruptcy Code by the LICENSEE as a debtor or alleged debtor.

7.2 **Termination by LICENSEE**.

(a) LICENSEE shall have the right at any time and for any reason to terminate this Agreement upon a ninety (90) day written notice to UNIVERSITY. Said notice shall state LICENSEE's reason for terminating this Agreement.

(b) Any termination under Paragraph 7.2(a) shall not relieve LICENSEE of any obligation or liability accrued under this Agreement prior to termination or rescind any payment made to UNIVERSITY or action by LICENSEE prior to the time termination becomes effective. Termination shall not affect in any manner any rights of UNIVERSITY arising under this Agreement prior to termination.

7.3 **Term**. Unless otherwise terminated by operation of law or by acts of the parties in accordance with the terms of this Agreement, this Agreement will be in force throughout the Term, and will expire upon the completion of the Term. Upon the natural termination of the Term, the licenses granted hereunder shall be deemed to be fully paid up, perpetual and irrevocable.

7.4 **Survival on Termination or Expiration**. The following paragraphs and articles shall survive the termination or expiration of this Agreement:

(a) Article 4 (REPORTS, RECORDS AND PAYMENTS);

(b) Paragraph 7.5 (Disposition of Licensed Products on Hand);

(c) Article 8 (LIMITED WARRANTY AND INDEMNIFICATION);

(d) Article 9 (USE OF NAMES AND TRADEMARKS);

(e) Paragraph 10.2 (Secrecy);

(f) Paragraph 10.5 (Failure to Perform); and

(g) Paragraph 10.6 (Governing Laws).

7.5 **Disposition of Licensed Products on Hand**. Upon termination of this Agreement, LICENSEE may dispose of all previously made or partially made Licensed Product within a period of one hundred and eighty (180) days of the effective date of such termination provided that the sale of such Licensed Product by LICENSEE, its Sublicensees, or Affiliates shall be subject to the terms of this Agreement, including but not limited to the rendering of reports and payment of royalties required under this Agreement.

ARTICLE 8. LIMITED WARRANTY AND INDEMNIFICATION

8.1 **Limited Warranty**.

(a) UNIVERSITY warrants that it has the lawful right to grant this license. This warranty does not include Patent Rights to the extent assigned, or otherwise licensed, by UNIVERSITY's inventors to third parties.

(b) The license granted herein is provided "AS IS" and without WARRANTY OF MERCHANTABILITY or WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE or any other warranty, express or implied. UNIVERSITY makes no representation or warranty that the Licensed Product, Licensed Method or the use of Patent Rights will not infringe any other patent or other proprietary rights.

(c) UNIVERSITY WILL NOT BE LIABLE FOR ANY LOST PROFITS, COSTS OF PROCURING SUBSTITUTE GOODS OR SERVICES, LOST BUSINESS, ENHANCED DAMAGES FOR INTELLECTUAL PROPERTY INFRINGEMENT, OR FOR ANY INDIRECT, INCIDENTAL, CONSEQUENTIAL, PUNITIVE, OR OTHER SPECIAL DAMAGES SUFFERED BY LICENSEE, SUBLICENSEES, JOINT VENTURES, OR AFFILIATES ARISING OUT OF OR RELATED TO THIS AGREEMENT FOR ALL CAUSES OF ACTION OF ANY KIND (INCLUDING TORT, CONTRACT, NEGLIGENCE, STRICT LIABILITY AND BREACH OF WARRANTY) EVEN IF UNIVERSITY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. ALSO, UNIVERSITY WILL NOT BE LIABLE FOR ANY DIRECT DAMAGES SUFFERED BY LICENSEE, SUBLICENSEES, JOINT VENTURES, OR AFFILIATES ARISING OUT OF OR RELATED TO PATENT RIGHTS TO THE EXTENT ASSIGNED, OR OTHERWISE LICENSED, BY UNIVERSITY'S INVENTORS TO THIRD PARTIES.

(d) Nothing in this Agreement shall be construed as:

(i) a warranty or representation by UNIVERSITY as to the validity or scope of any Patent Rights;

(ii) a warranty or representation that anything made, used, sold or otherwise disposed of under any license granted in this Agreement is or shall be free from infringement of patents of third parties;

(iii) an obligation to bring or prosecute actions or suits against third parties for patent infringement except as provided in Paragraph 5.2 hereof;

(iv) conferring by implication, estoppel or otherwise any license or rights under any patents of UNIVERSITY other than Patent Rights as defined in this Agreement, regardless of whether those patents are dominant or subordinate to Patent Rights; or

(v) an obligation to furnish any know-how not provided in Patent Rights.

8.2 **Indemnification**.

(a) LICENSEE will, and will require Sublicensees to, indemnify, hold harmless, and defend UNIVERSITY and its officers, employees, and agents; the sponsors of the research that led to the Inventions; and the inventors of patents or patent applications under Patent Rights, and their employers; against any and all claims, suits, losses, damages, costs, fees, and expenses resulting from, or arising out of, the exercise of this license or any Sublicense. This indemnification will include, but will not be limited to, any product liability.

(b) LICENSEE, at its sole cost and expense, shall insure its activities in connection with the work under this Agreement and obtain, keep in force and maintain insurance or an equivalent program of self-insurance as follows:

(i) comprehensive or commercial general liability insurance (contractual liability included) with limits of at least: (A) each occurrence, five million dollars (US$5,000,000); (B) products/completed operations aggregate, ten million dollars (US$10,000,000); (C) personal and advertising injury, five million dollars (US$5,000,000); and (D) general aggregate (commercial form only), ten million dollars (US$ I 0,000,000). If the above insurance is written on a claims-made form, it shall continue for three (3) years following termination or expiration of this Agreement.

(ii) Worker’s Compensation as legally required in the jurisdiction in which the LICENSEE is doing business; and

(iii) the coverage and limits referred to above shall not in any way limit the liability of LICENSEE.

(c) If requested by UNIVERSITY, LICENSEE shall furnish UNIVERSITY with certificates of insurance showing compliance with all requirements. Such certificates shall: (i) provide for thirty (30) day advance written notice to UNIVERSITY of any modification; (ii) indicate that UNIVERSITY has been endorsed as an additionally insured party under the coverage referred to above; and (iii) include a provision that the

coverage shall be primary and shall not participate with nor shall be excess over any valid and collectable insurance or program of self-insurance carried or maintained by UNIVERSITY.

(d) UNIVERSITY shall notify LICENSEE in writing of any claim or suit brought against UNIVERSITY in respect of which UNIVERSITY intends to invoke the provisions of this Article. LICENSEE shall keep UNIVERSITY informed on a current basis of its defense of any claims under this Article. LICENSEE will not settle any claim against UNIVERSITY without UNIVERSITY's written consent, where (a) such settlement would include any admission of liability or admission of wrong doing on the part of the indemnified party, (b) such settlement would impose any restriction on UNIVERSITY /indemnified party's conduct of any of its activities, or (c) such settlement would not include an unconditional release of UNIVERSITY/indemnified party from all liability for claims that are the subject matter of the settled claim.

ARTICLE 9. USE OF NAMES AND TRADEMARKS

9.1 Except as provided in Paragraph 9.3, nothing contained in this Agreement confers any right to use in advertising, publicity, or other promotional activities any name, trade name, trademark, or other designation of either party hereto (including contraction, abbreviation or simulation of any of the foregoing). Unless required by law, the use by LICENSEE of the name, "The Regents of the University of California" or the name of any campus of the University of California in advertising, publicity, or other promotional activities is prohibited, without the express written consent of UNIVERSITY.

9.2 UNIVERSITY may disclose to the Inventors the terms and conditions of this Agreement upon their request. If such disclosure is made, UNIVERSITY shall request the Inventors not disclose such terms and conditions to others.

9.3 UNIVERSITY may acknowledge the existence of this Agreement and the extent of the grant in Article 2 to third parties, but UNIVERSITY shall not disclose the financial terms of this Agreement to third parties, except where UNIVERSITY is required by law to do so, such as under the California Public Records Act and in compliance with the terms of the sponsorship agreement with CIRM. LICENSEE hereby grants permission for UNIVERSITY (including UCSD) to include LICENSEE's name and a link to LICENSEE's website in UNIVERSITY's and UCSD's annual reports and on UNIVERSITY's (including UCSD's) websites that showcase technology transfer-related stories.

ARTICLE 10. MISCELLANEOUS PROVISIONS

10.1 **Correspondence**. Any notice or payment required to be given to either party under this Agreement shall be deemed to have been properly given and effective:

(a) on the date of delivery if delivered in person,

(b) five (5) days after mailing if mailed by first-class or certified mail, postage paid, to the respective addresses given below, or to such other address as is designated by written notice given to the other party, or

(c) upon confirmation by recognized national overnight courier, confirmed facsimile transmission, or confirmed electronic mail, to the following addresses or facsimile numbers of the parties.

If sent to LICENSEE:

Oncternal Therapeutics, Inc.
3525 Del Mar Heights Road, Suite 821
San Diego, California 92130
Attention: CEO
Phone: [***]
Email: [***]

With a copy to:

Hale BioPharma Ventures, LLC
1042-B N. El Camino Real, Suite 430
Encinitas, California 92024-1322
Attention: David F. Hale
Email: [***]

If sent to UNIVERSITY by mail:

University of California, San Diego
Office of Innovation and Commercialization
9500 Gilman Drive, Mail Code 0910
La Jolla, California 92093-0910
Attention: Director

If sent to UNIVERSITY by overnight delivery:

University of California, San Diego
Office of Innovation and Commercialization
10300 North Torrey Pines Road
Torrey Pines Center North, Third Floor
La Jolla, California 92037
Attention: Assistant Vice Chancellor

10.2 **Secrecy**.

(a) "Confidential Information" shall mean information relating to the Inventions and disclosed by UNIVERSITY to LICENSEE during the term of this Agreement, which if disclosed in writing shall be marked "Confidential", or if first disclosed otherwise, shall

within thirty (30) days of such disclosure be reduced to writing by UNIVERSITY and sent to LICENSEE:

(b) LICENSEE shall:

(i) use the Confidential Information for the sole purpose of performing under the terms of this Agreement;

(ii) safeguard Confidential Information against disclosure to others with the same degree of care as it exercises with its own data of a similar nature;

(iii) not disclose Confidential Information to others (except to its employees, agents or consultants who are bound to LICENSEE by a like obligation of confidentiality) without the express written permission of UNIVERSITY, except that LICENSEE shall not be prevented from using or disclosing any of the Confidential Information that:

(A) LICENSEE can demonstrate by written records was previously known to it;

(B) is now, or becomes in the future, public knowledge other than through acts or omissions of LICENSEE;

(C) is lawfully obtained by LICENSEE from sources independent of UNIVERSITY; or

(D) is required to be disclosed by law or a court of competent jurisdiction; and

(c) The secrecy obligations of LICENSEE with respect to Confidential Information shall continue for a period ending five (5) years from the termination date of this Agreement.

(d) For the sake of clarity, LICENSEE may disclose the existence of this Agreement (including the fact that it contains license grants to Patent Rights) and the terms and conditions contained herein to the extent such disclosure is reasonably necessary for the following purposes: (i) conducting clinical trials; (ii) making regulatory filings; (iii) complying with applicable governmental regulations; (iv) submitting information to acquirers or Sublicensees of all or a portion of the Patent Rights (potential and actual), consultants and others having a need to know for the purposes of development, manufacture or marketing of Licensed Product or Licensed Method pursuant to this Agreement, provided that such acquirers, Sublicensees, consultants and others shall also agree to appropriate and comparable confidentiality and non-use provisions as provided for in this Paragraph 10.2; (v) to the extent required by applicable law (including without limitation any filings by LICENSEE with the Securities and Exchange Commission or similar authority), orders of courts, regulatory authorities or similar bodies having jurisdiction over LICENSEE; and (vi) fund-raising.

10.3 **Assignability**. This Agreement may be assigned by UNIVERSITY, but is personal to LICENSEE and assignable by LICENSEE only with the written consent of UNIVERSITY. Notwithstanding the foregoing, LICENSEE may assign its rights under this Agreement in whole or in part to an Affiliate or to a successor-in-interest to all or substantially all of the business of LICENSEE to which this Agreement relates upon written notice to UNIVERSITY for the part of its rights so assigned and only to the extent that assignee Affiliate is responsible for LICENSEE's duties under this Agreement incurred before the assignment as well as after assignment and payment of an assignment fee equal to [***] of the value of the transaction.

10.4 **No Waiver**. No waiver by either party of any breach or default of any covenant or agreement set forth in this Agreement shall be deemed a waiver as to any subsequent and/or similar breach or default.

10.5 **Failure to Perform**. In the event of a failure of performance due under this Agreement and if it becomes necessary for either party to undertake legal action against the other on account thereof, then the prevailing party shall be entitled to reasonable attorneys' fees in addition to costs and necessary disbursements.

10.6 **Governing Laws**. THIS AGREEMENT SHALL BE INTERPRETED AND CONSTRUED IN ACCORDANCE WITH THE LAWS OF THE STATE OF CALIFORNIA, but the scope and validity of any patent or patent application shall be governed by the applicable laws of the country of the patent or patent application.

10.7 **Force Majeure**. A party to this Agreement may be excused from any performance required herein if such performance is rendered impossible or unfeasible due to any catastrophe or other major event beyond its reasonable control, including, without limitation, war, riot, and insurrection; laws, proclamations, edicts, ordinances, or regulations; changes in regulatory agency policy, practices or demands; strikes, lockouts, or other serious labor disputes; and floods, fires, explosions, or other natural disasters. When such events have abated, the non-performing party's obligations herein shall resume.

10.8 **Headings**. The headings of the several articles and paragraphs are inserted for convenience of reference only and are not intended to be a part of or to affect the meaning or interpretation of this Agreement.

10.9 **Entire Agreement**. This Agreement embodies the entire understanding of the parties and supersedes all previous communications, representations or understandings, either oral or written, between the parties relating to the subject matter hereof.

10.10 **Amendments**. No amendment or modification of this Agreement shall be valid or binding on the parties unless made in writing and signed on behalf of each party.

10.11 **Severability**. In the event that any of the provisions contained in this Agreement is held to be invalid, illegal, or unenforceable in any respect, such invalidity, illegality or unenforceability shall not affect any other provisions of this Agreement, and this

Agreement shall be construed as if the invalid, illegal, or unenforceable provisions had never been contained in it.

[*Signature page follows*]

IN WITNESS WHEREOF, both UNIVERSITY and LICENSEE have executed this Agreement, in duplicate originals, by their respective and duly authorized officers on the day and year written.

ONCTERNAL THERAPEUTICS, INC.:

By: /s/ James Breitmeyer
(Signature)

Name: James Breitmeyer
Title: President and Chief Executive Officer

Date: 8/31/2018

THE REGENTS OF THE UNIVERSITY OF CALIFORNIA:

By: /s/ Ruben Flores, Ph.D.
(Signature)

Ruben Flores, Ph.D.
President and Chief Executive Officer

Date: 8/30/2018

EXHIBIT A

TITLE 17, CALIFORNIA CODE OF REGULATIONS

§ 100607. Access Requirements for Products Developed by Grantees.

(a) A Grantee, a Collaborator or an Exclusive Licensee that is commercializing a Drug, as defined in Title 17, California Code of Regulations, section 100601, subdivision (i), that resulted in whole or in part from CIRM-Funded Research must submit a plan to afford access to such a Drug to Californians who have no other means to purchase the Drug. As used in this section, “no other means” means Californians who are not covered by a prescription drug benefit provided by any third-party payer (private or public) covering the particular Drug, and whose family incomes are below 300 percent of the federal poverty level. The access plan must be consistent with industry standards at the time of commercialization accounting for the size of the market for the Drug and the resources of the Grantee, the Collaborator or its Exclusive Licensee. Grantees, Collaborators and/or their Exclusive Licensees shall have the burden of establishing that the proposed access plan satisfies the requirements of this Section.

(b) A Grantee, a Collaborator or an Exclusive Licensee that commercializes a Drug must submit the access plan described in subdivision (a) of this regulation to CIRM within 10 business days following final approval of the Drug by the federal Food and Drug Administration, unless, within that timeframe, the Grantee, Collaborator or Exclusive Licensee seeks an extension from CIRM. If CIRM grants an extension, the access plan must be submitted no later than 30 business days following final approval of the Drug by the federal Food and Drug Administration.

(c) The access plan shall be subject to the approval of CIRM after a public hearing conducted by CIRM that provides for receipt of public comment. CIRM may adopt appropriate procedures to protect proprietary information submitted by Grantees, Collaborators and Exclusive Licensees in connection with said public hearing. Approval shall not be unreasonably

withheld. Overall, CIRM shall not require that proposed Access plans exceed industry standards for such plans at the time of commercialization in California.

(d) Access plans approved hereunder shall make Grantees, Collaborators and Exclusive Licensees that commercialize a Drug responsible only for providing the Drug itself. Nothing herein shall require the Grantee, Collaborator or Exclusive Licensee to be responsible for any costs of administering the Drug nor for any associate costs of medical procedures or protocols for the Drug therapy, nor for any costs for attendant care.

(e) The Independent Citizens Oversight Committee ("ICOC") may waive the requirement in subdivision (a) of this section if the ICOC determines, after a public hearing, that in the absence of the waiver, development and broad delivery of the Drug will be unreasonably hindered or that the waiver will provide significant benefits that equal or exceed the benefits that would otherwise flow to the state pursuant to subdivision (a) of this section. To invoke this waiver provision, a Grantee, Collaborator or Exclusive Licensee must deliver a written request to the Chair of the ICOC within 10 business days following final approval of the Drug by the federal Food and Drug Administration, unless the Chair of the ICOC agrees to an extension. The request must be accompanied by materials describing how development and broad delivery of the Drug will be unreasonably hindered by compliance with subdivision (a) of this section, and/or how the waiver will provide significant benefits that equal or exceed the benefits that would otherwise flow to the state pursuant to subdivision (a) of this section. The request shall be posted on CIRM's website no fewer than ten (10) business days prior to the ICOC's consideration. The ICOC may meet in closed session to review confidential or proprietary material, or other material as allowed by Health and Safety Code section 125290.30, subdivision (d).

(f) A Grantee, Collaborator, or an Exclusive Licensee that is commercializing the Drug must provide a Drug, that resulted in whole or in part from CIRM-Funded Research, at a price as provided in the California Discount Prescription Drug Program (commencing with California Health and Safety Code section 130500) (or a successor statewide prescription drug discount program) to eligible Californians under said program.

(g) A Grantee, Collaborator or its Exclusive Licensee that is commercializing the Drug must sell a Drug, that resulted in whole or in part from CIRM-Funded Research, and which is purchased in California with Public Funds (as defined in Title 17, California Code of Regulations, section 100601, subdivision (cc)) at any benchmark price described in the California Discount Prescription Drug Program or a successor statewide prescription drug discount program.

(h) This regulation is not intended, and this-regulation shall not be construed, to preempt or prevent any other requirement under state or federal law or regulation, or agreement or contract, that would result in selling a Drug at a lower price than provided hereunder. Note: Authority cited: Article XXXV, California Constitution; and Section 125290.40(j), Health and Safety Code.

Reference: Sections 125290.30 and 125290.80, Health and Safety Code.

§ 100610. March-In Rights.

(a) CIRM may request that a Grantee, Collaborator or an Exclusive Licensee enter into a nonexclusive, partially exclusive, or Exclusive License Agreement with respect to a CIRM-Funded Invention or CIRM-Funded Technology, in any field of use or territory with a responsible applicant or applicants, upon terms that are reasonable under the circumstances.

(b) If a Grantee, Collaborator or an Exclusive Licensee refuses CIRM's request to enter into a License Agreement to a CIRM-Funded Invention or CIRM-Funded Technology as provided by this regulation, CIRM shall have the right to enter into such a license with an applicant on behalf of the Grantee or its Exclusive Licensee (march-in) if:

(1) the Grantee, Collaborator or an Exclusive Licensee has not made reasonable efforts to achieve practical application of a CIRM-Funded Invention and/or CIRM-Funded Technology, as applicable;

(2) the Grantee, Collaborator or an Exclusive Licensee have failed to provide or comply with a plan for access to a Drug in accordance with Title 17, California Code of Regulations, section 100607;

(3) the Grantee, Collaborator or Exclusive Licensee has unreasonably failed to use a CIRM-Funded Invention or CIRM- Funded Technology to alleviate public health and safety needs that constitute a public health emergency as declared by the Governor.

(c) One consideration in taking the action described in subdivision (b) of this regulation will be whether doing so will impinge on the Grantee's, Collaborator's or Exclusive Licensee's academic freedoms.

(d) CIRM will promptly notify a Grantee, Collaborator or an Exclusive Licensee of any adverse determination under this provision and the basis therefore, as well as its intention to exercise march-in rights ("March-In Notice").

(e) CIRM will not exercise its march-in rights if the Grantee, Collaborator or an Exclusive Licensee promptly takes action to cure the deficiency and such deficiency is cured sooner than one year from the date of the March-In Notice (or longer period by mutual agreement). With respect to a deficiency described in subdivision (b)(3) of this regulation, however, CIRM may exercise such right at any time in the event of a public health or safety emergency declared by the Governor and where CIRM finds that exercise of march-in rights is likely to alleviate the circumstances or conditions that give rise to the emergency declaration.

(f) Within thirty (30) days of the date CIRM issues a March-In Notice, the subject Grantee may appeal CIRM's decision to the ICOC by notifying the President of CIRM in writing of its intent to appeal CIRM's decision. Within sixty (60) days of the March-In Notice date, the subject Grantee must submit a written statement of the reasons for the appeal and any supporting materials it wishes to have considered by the ICOC. Absent

extraordinary circumstances, the ICOC shall render a final determination on the appeal within one hundred twenty (120) days of the March-In Notice. In cases where an appeal is filed, CIRM shall not effect a march-in unless and until the ICOC renders a final determination on the appeal. The ICOC may reverse the decision of the CIRM to exercise march-in rights under this regulation for any reason.

(g) Unless provided otherwise by CIRM, any applicant to receive a License or Assignment pursuant to this regulation will be bound by this Chapter as if it were an original Grantee recipient of the funding that resulted in the applicable CIRM-Funded Invention or CIRM-Funded Technology.

EXHIBIT B

ARTICLES OF INCORPORATION

AMENDED AND RESTATED CERTIFICATE OF INCORPORATION
OF
ONCTERNAL THERAPEUTICS, INC.

(Pursuant to Sections 242 and 245 of the
General Corporation Law of the State of Delaware)

Oncternal Therapeutics, Inc., a corporation organized and existing under and by virtue of the provisions of the General Corporation Law of the State of Delaware (the "***General Corporation Law***"),

DOES HEREBY CERTIFY:

FIRST: That the name of this corporation is Oncternal Therapeutics, Inc. and that this corporation was originally incorporated pursuant to the General Corporation Law on November 18, 2013 under the name Tokalas, Inc.

SECOND: That the Board of Directors duly adopted resolutions proposing to amend and restate the Certificate of Incorporation of this corporation, declaring said amendment and restatement to be advisable and in the best interests of this corporation and its stockholders, and authorizing the appropriate officers of this corporation to solicit the consent of the stockholders therefor, which resolution setting forth the proposed amendment and restatement is as follows:

RESOLVED, that the Certificate of Incorporation of this corporation be amended and restated in its entirety as follows:

ARTICLE I.

The name of this corporation is Oncternal Therapeutics, Inc. (referred to herein as the "***Corporation***").

ARTICLE II.

The address of its registered office in the State of Delaware is Corporation Trust Center, 1209 Orange Street, New Castle County, Delaware 19801. The name of its registered agent at such address is The Corporation Trust Company.

ARTICLE III.

The nature of the business and purpose of this corporation is to engage in any lawful act or activity for which corporations may be organized under the General Corporation Law.

ARTICLE IV.

A. **Authorization of Stock**. The Corporation is authorized to issue two classes of stock designated, Common Stock, par value $0.0001 per share ("***Common Stock***") and Preferred

Stock, par value $0.0001 per share ("***Preferred Stock***"). The Preferred Stock shall consist of three series, one of which shall be designated "***Series A Preferred Stock***", one of which shall be designated "***Series B Preferred Stock***", and one of which shall be designated "***Series B-2 Preferred Stock***". The number of shares of Common Stock which this Corporation is authorized to issue is 200,000,000. The number of shares of Preferred Stock which this Corporation is authorized to issue is 143,560,000, of which 75,000,000 shares shall be designated Series B-2 Preferred Stock, 55,000,000 shares shall be designated Series B Preferred Stock, and 13,560,000 shares shall be designated Series A Preferred Stock.

B. Preferred Stock. The following is a statement of the designations and the powers, privileges and rights, and the qualifications, limitations or restrictions thereof in respect of each series of Preferred Stock of this Corporation. Unless otherwise indicated, references to "Sections" or "subsections" in this Part B of Article IV refer to sections and subsections of Part B of this Article IV.

1. Dividends. In the event dividends are paid on any share of Common Stock, the Corporation shall pay an additional dividend on all outstanding shares of Preferred Stock in a per share amount equal (on an as-if-converted to Common Stock basis) to the amount paid or set aside for each share of Common Stock. Such dividends shall be payable only when, as and if declared by the Board of Directors of the Corporation.

2. Liquidation.

(a) Preferences.

(i) In the event of any voluntary or involuntary dissolution, liquidation or winding up of the affairs of the Corporation (a "***Liquidation Event***"), after payment or provision for payment of the debts and other liabilities of the Corporation, the holders of each share of Series B-2 Preferred Stock shall be entitled to receive on a pro rata basis out of the assets of the Corporation, whether such assets are capital, surplus or earnings, an amount equal to the Liquidation Value (as set forth in Section 2(e)) of such share, which amount shall be paid prior to and in preference of any payment made or assets distributed on the Series B Preferred Stock, the Series A Preferred Stock, the Common Stock or any other class or series of capital stock of the Corporation.

(ii) In the event of a Liquidation Event, after payment to the holders of Series B-2 Preferred Stock of the full amounts specified in Section 2(a)(i) above, the holders of each share of Series B Preferred Stock shall be entitled to receive on a pro rata basis out of the assets of the Corporation, whether such assets are capital, surplus or earnings, an amount equal to the Liquidation Value (as set forth in Section 2(e)) of such share, which amount shall be paid prior to and in preference of any payment made or assets distributed on the Series A Preferred Stock, the Common Stock or any other class or series of capital stock of the Corporation.

(iii) In the event of a Liquidation Event, after payment to the holders of Series B Preferred Stock of the full amounts specified in Section 2(a)(ii) above, the holders of each share of Series A Preferred Stock shall be entitled to receive on a pro rata basis out of the assets of the Corporation, whether such assets are capital, surplus or earnings, an amount equal to

the Liquidation Value (as set forth in Section 2(e)) of such share, which amount shall be paid prior to and in preference of any payment made or assets distributed on the Common Stock or any other class or series of capital stock of the Corporation.

(b) Partial Payment. If upon any Liquidation Event the assets of the Corporation distributable as aforesaid among the holders of the Series B-2 Preferred Stock, the Series B Preferred Stock or the Series A Preferred Stock, as applicable, shall be insufficient to permit the payment to them of the full preferential amounts to which they are entitled, then the entire remaining assets of the Corporation so to be distributed shall be distributed ratably among the holders of the Series B-2 Preferred Stock, the Series B Preferred Stock or the Series A Preferred Stock, as applicable, in proportion to the sum of their respective per share Liquidation Value; provided that no payments shall be made to holders of the Series B Preferred Stock until the holders of the Series B-2 Preferred Stock have received the full preferential amounts to which they are entitled, and no payments shall be made to holders of the Series A Preferred Stock until the holders of the Series B Preferred Stock have received the full preferential amounts to which they are entitled.

(c) Remaining Assets. After payment to the holders of Preferred Stock of the amounts set forth in Section 2(a) above, the entire remaining assets and funds of the Corporation legally available for distribution, if any, shall be distributed ratably among the holders of the Common Stock and the holders of the Preferred Stock on an as-converted to Common Stock basis at the then applicable conversion rate, until such time as each share of Preferred Stock has received an aggregate distribution of three times (3x) the applicable Liquidation Value for such share of Preferred Stock (as adjusted for all stock splits, stock dividends, consolidations, recapitalizations and reorganizations) (which aggregate distribution amount shall include (i) distributions made pursuant to Section 2(a) above and (ii) distributions made pursuant to this Section 2(c)), at which point no further payments shall be made to holders of the Preferred Stock by reason thereof and any remaining assets of the Corporation shall be distributed ratably among the holders of the Common Stock.

(d) Deemed Conversion. Notwithstanding the above Sections 2(a), (b) and (c), for purposes of determining the amount each holder of shares of Preferred Stock is entitled to receive with respect to a Liquidation Event, each such holder of shares of Preferred Stock shall be deemed to have converted (regardless of whether such holder actually converted) such holder’s shares of Preferred Stock into shares of Common Stock immediately prior to the Liquidation Event if, as a result of an actual conversion, such holder would receive, in the aggregate, an amount greater than the amount that would be distributed to such holder if such holder did not convert such Preferred Stock into shares of Common Stock. If any such holder shall be deemed to have converted shares of Preferred Stock into Common Stock pursuant to this Section 2(d), then such holder shall not be entitled to receive any distribution that would otherwise be made to holders of Preferred Stock.

(e) Liquidation Value. The “Liquidation Value” per share of Series A Preferred Stock as of any particular date shall be the sum of (A) $0.25 (as adjusted for all stock splits, stock dividends, consolidations, recapitalizations and reorganizations) plus (B) all declared but unpaid dividends as of the date the Liquidation Value of such share is determined. The Liquidation Value per share of Series B Preferred Stock as of any particular date shall be the

sum of (A) $0.45 (as adjusted for all stock splits, stock dividends, consolidations, recapitalizations and reorganizations) plus (B) all declared but unpaid dividends as of the date the Liquidation Value of such share is determined. The Liquidation Value per share of Series B-2 Preferred Stock as of any particular date shall be the sum of (A) $0.45 (as adjusted for all stock splits, stock dividends, consolidations, recapitalizations and reorganizations) plus (B) all declared but unpaid dividends as of the date the Liquidation Value of such share is determined. The Liquidation Value as it applies to each series of Preferred Stock is sometimes referred to herein as the "***Liquidation Value***."

(f) Deemed Liquidation Events.

(i) Definition. For purposes of this Section 2, a Liquidation Event shall be deemed to be occasioned by, or to include, the following (each, a "***Deemed Liquidation Event***") unless the Requisite Holders elect otherwise:

(a) a merger or consolidation in which

(i) the Corporation is a constituent party, or

(ii) a Subsidiary of the Corporation is a constituent party and the Corporation issues shares of its capital stock pursuant to such merger or consolidation, except any such merger or consolidation involving the Corporation or a Subsidiary in which the shares of capital stock of the Corporation outstanding immediately prior to such merger or consolidation continue to represent, or are converted into or exchanged for shares of capital stock that represent, immediately following such merger or consolidation, at least a majority, by voting power, of the capital stock of (1) the surviving or resulting corporation or (2) if the surviving or resulting corporation is a wholly owned subsidiary of another corporation immediately following such merger or consolidation, the parent corporation of such surviving or resulting corporation (provided that, for the purpose of this Section 2(f)(i)(a), all shares of Common Stock issuable upon exercise of stock options of the Corporation outstanding immediately prior to such merger or consolidation or upon conversion of convertible securities of the Corporation outstanding immediately prior to such merger or consolidation shall be deemed to be outstanding immediately prior to such merger or consolidation and, if applicable, converted or exchanged in such merger or consolidation on the same terms as the actual outstanding shares of Common Stock are converted or exchanged); provided, that the preceding exception shall not apply (and such merger or consolidation shall be a Deemed Liquidation Event) to a merger or consolidation involving the Corporation or a Subsidiary where such transaction is entered into with an entity that has its securities registered under the Securities Act of 1933, as amended, listed on a nationally recognized stock exchange or market system, including without limitation The NASDAQ Global Select Market, The NASDAQ Global Market or The NASDAQ Capital Market, or quoted on an automated quotation system (including the Pink Sheets and the OTC Bulletin Board) or by a recognized securities dealer; or

(b) the sale, lease, transfer, exclusive license or other disposition, in a single transaction or series of related transactions, by the Corporation or any Subsidiary of the Corporation of all or substantially all the assets of the Corporation and its Subsidiaries taken as a whole, or the sale or disposition (whether by merger or otherwise) of one or more Subsidiaries of

the Corporation if substantially all of the assets of the Corporation and its Subsidiaries taken as a whole are held by such Subsidiary or Subsidiaries, except where such sale, lease, transfer, exclusive license or other disposition is to a wholly owned Subsidiary of the Corporation.

(ii) Effecting a Deemed Liquidation Event.

(a) The Corporation shall not have the power to effect a Deemed Liquidation Event referred to in Section 2(f)(i)(a) unless the agreement or plan of merger or consolidation for such transaction provides that the consideration payable to the stockholders of the Corporation shall be allocated among the holders of capital stock of the Corporation in accordance with Sections 2(a), (b), (c) and (d).

(b) In the event of a Deemed Liquidation Event referred to in Section 2(f)(i)(a)(ii) or 2(f)(i)(b), if the Corporation does not effect a dissolution of the Corporation under the General Corporation Law within 90 days after such Deemed Liquidation Event, then (i) the Corporation shall send a written notice to each holder of Preferred Stock no later than the 90th day after the Deemed Liquidation Event advising such holders of their right (and the requirements to be met to secure such right) pursuant to the terms of the following clause (ii) to require the redemption of such shares of Preferred Stock, and (iii) if the holders of at least a majority of the then outstanding shares of Preferred Stock so request in a written instrument delivered to the Corporation not later than 120 days after such Deemed Liquidation Event, the Corporation shall use the consideration received by the Corporation for such Deemed Liquidation Event (net of any retained liabilities associated with the assets sold or technology licensed, as determined in good faith by the Board of Directors of the Corporation), together with any other assets of the Corporation available for distribution to its stockholders (the "***Available Proceeds***"**),** to the extent legally available therefor, on the 150th day after such Deemed Liquidation Event, to redeem all outstanding shares of Preferred Stock at a price per share equal to the applicable Liquidation Value. Notwithstanding the foregoing, in the event of a redemption pursuant to the preceding sentence, if the Available Proceeds are not sufficient to redeem all outstanding shares of Preferred Stock, the Corporation shall first redeem a pro rata portion of shares of Series A Preferred Stock, Series B Preferred Stock and Series B-2 Preferred Stock in accordance with the liquidation preferences set forth in Sections 2(a) and (b) to the fullest extent of such Available Proceeds, and shall redeem the remaining shares to have been redeemed as soon as practicable after the Corporation has funds legally available therefor. Prior to the distribution or redemption provided for in this Section 2(f)(ii)(b), the Corporation shall not expend or dissipate the consideration received for such Deemed Liquidation Event, except to discharge expenses incurred in connection with such Deemed Liquidation Event or in the ordinary course of business.

(iii) Notice. The Corporation shall give each holder of record of Preferred Stock written notice of such impending event described in Section 2(f)(i) not later than twenty (20) calendar days prior to the stockholders meeting called to approve such transaction, or twenty (20) calendar days prior to the closing of such transaction, whichever is earlier, and shall also notify such holders in writing of the final approval of such transaction. The first of such notices shall describe the material terms and conditions of the impending transaction and the provisions of Section 2, and the Corporation shall thereafter give such holders prompt notice of any material changes. The transaction shall in no event take place sooner than twenty (20)

calendar days after the Corporation has given the first notice provided for herein or sooner than ten (10) calendar days after the Corporation has given notice of any material changes provided for herein. Notwithstanding anything to the contrary in subsection 2(f)(ii) or 2(f)(iii), the periods set forth in subsection 2(f)(ii) and 2(f)(iii) may be shortened and/or notice may be waived upon the Corporation's receipt of written consent of the Requisite Holders.

3. Redemption. The Corporation shall not be obligated to, and shall not have the right to, call or redeem any shares of the Preferred Stock, except in accordance with Section 2(f)(ii)(b) above.

4. Voting Rights; Directors.

(a) Generally. On all matters to come before the stockholders, the Preferred Stock shall have that number of votes per share (rounded up to the nearest whole share) equivalent to the number of shares of Common Stock into which such share of Preferred Stock is then convertible determined by reference to the applicable Conversion Price in effect at the record date of the determination of the holders of the shares entitled to vote or, if no such record date is established, at the date such vote is taken or any written consent of stockholders is first solicited. Each holder of shares of Common Stock shall be entitled to one (1) vote for each share thereof held. Except as otherwise provided by law or this Amended and Restated Certificate of Incorporation, the holders of Preferred Stock shall vote together with the holders of the outstanding shares of Common Stock, and not as a separate class or series.

(b) Directors.

(i) The authorized number of directors shall be seven (7) until this provision is amended in accordance with the terms of this Amended and Restated Certificate of Incorporation. The holders of the outstanding shares of Series A Preferred Stock, voting as a separate class and to the exclusion of all other classes of capital stock of the Corporation, shall be entitled to elect one (1) member of the Board of Directors (the "***Series A Director***"). The holders of the outstanding shares of Series B-2 Preferred Stock, voting as a separate class and to the exclusion of all other classes of capital stock of the Corporation, shall be entitled to elect two (2) members of the Board of Directors (the "***Series B-2 Directors***", together with the Series A Director, the "***Preferred Directors***"). The holders of the outstanding shares of Common Stock, voting as a separate class and to the exclusion of all other classes of capital stock of the Corporation, shall be entitled to elect three (3) members of the Board of Directors (the "***Common Directors***"). The holders of the outstanding shares of Preferred Stock and Common Stock, voting together as a single class, shall be entitled to elect the remaining member of the Board of Directors (the "***General Director***"). For administrative convenience, the initial Series B-2 Directors may also be appointed by the Board of Directors in connection with the approval of the initial issuance of Series B-2 Preferred Stock without a separate action by the holders of the Series B-2 Preferred Stock.

(ii) In the case of any vacancy in the office of a director occurring among the Preferred Directors or the Common Directors, by the affirmative vote of the holders of a majority of the shares of the class or classes entitled to vote on the election of the Preferred Directors or Common Directors, as the case may be, such holders shall elect a successor or

successors to hold the office for the unexpired term of the director or directors whose place or places shall be vacant. In the case of any vacancy in the office of a General Director, by the affirmative vote of the holders of a majority of the shares of Preferred Stock and Common Stock, voting together as a single class, such holders shall elect a successor or successors to hold the office for the unexpired term of the director or directors whose place or places shall be vacant. Any director may be removed during the aforesaid term of office, whether with or without cause, only by the affirmative vote of the holders of a majority of the shares eligible to vote in an election for the seat occupied by that director (e.g., in order to remove a Series A Director, the holders of a majority of the shares of Series A Preferred Stock, voting as a separate class and to the exclusion of all other classes of capital stock of the Corporation, must so vote).

(c) Protective Provisions. In addition to voting rights provided by law, so long as any shares of Preferred Stock shall be outstanding (as adjusted for all stock splits, stock dividends, consolidations, recapitalizations and reorganizations), the Corporation shall not, without the consent of the holders of at least a majority of the outstanding shares of Preferred Stock, given in person or by proxy, either in writing or by vote at a meeting called for that purpose at which the holders of the Preferred Stock shall vote together as a separate class and to the exclusion of all other classes of capital stock of the Corporation:

(i) declare or pay any dividends on any capital stock of the Corporation;

(ii) redeem or repurchase capital stock of the Corporation except in connection with the repurchase of shares of Common Stock issued to or held by employees, consultants, officers and directors upon termination of their employment or services pursuant to agreements providing for the right of said repurchase, which agreements were authorized by the Board of Directors;

(iii) take any action which would result in a Liquidation Event or a Deemed Liquidation Event;

(iv) increase or decrease the total number of authorized members of the Board of Directors;

(v) authorize, create or issue (whether by merger, consolidation, reclassification, amendment of this Amended and Restated Certificate of Incorporation, sale or otherwise) shares of any class or series of stock not authorized herein having rights, preferences or privileges superior to or on parity with the Series B-2 Preferred Stock; or

(vi) take any action to amend or waive any provision of this Amended and Restated Certificate of Incorporation or the Company's Bylaws.

5. Conversion. The rights of the holders of shares of Preferred Stock to convert such shares into shares of Common Stock (as defined in Section 5(h) below) of the Corporation (the "***Conversion Rights***"), and the terms and conditions of such conversion, shall be as follows:

(a) Right to Convert; Automatic Conversion.

(i) Each share of the Preferred Stock shall be convertible, at the option of the holder, in each case at the office of the Corporation or any transfer agent for the Preferred Stock or the Common Stock, into that number of the fully paid and nonassessable shares of Common Stock determined in accordance with the provisions of Section 5(b) below.

(ii) Before any holder of Preferred Stock shall be entitled to convert the same into shares of Common Stock, the holder shall surrender the certificate(s) therefor, duly endorsed, at the office of the Corporation or of any transfer agent for the Preferred Stock and shall give written notice to the Corporation at such office that the holder elects to convert the same (except that no such written notice of election to convert shall be necessary in the event of an automatic conversion pursuant to Section 5(a)(iv) hereof). The Corporation shall, as soon as practicable thereafter, issue and deliver at such office to such holder of Preferred Stock certificate(s) for the number of shares of Common Stock to which such holder shall be entitled as aforesaid. Such conversion shall be deemed to have been made immediately prior to the close of business on the date of such surrender of the shares of Preferred Stock to be converted; except that in the case of an automatic conversion pursuant to Sections 5(a)(iv)(A) and/or 5(a)(v)(A) hereof, such conversion shall be deemed to have been made immediately prior to the closing of the offering referred to in Sections 5(a)(iv)(A) and/or 5(a)(v)(A), or in the case of an automatic conversion pursuant to Sections 5(a)(iv)(B) and/or 5(a)(v)(B) hereof, immediately prior to the close of business on the date of the election referred to in Sections 5(a)(iv)(B) and/or 5(a)(v)(B), and the Person or Persons entitled to receive the shares of Common Stock issuable upon such conversion shall be treated for all purposes as the record holder or holders of such shares of Common Stock on such date. If the conversion is in connection with an underwritten public offering of securities registered pursuant to the Securities Act, the conversion may, at the option of any holder tendering Preferred Stock for conversion, be conditioned upon the closing with the underwriters of the sale of securities pursuant to such offering, in which event any Persons entitled to receive Common Stock upon conversion of Preferred Stock shall not be deemed to have converted such Preferred Stock until immediately prior to the closing of such sale of securities.

(iii) The Corporation shall, as soon as practicable after the surrender of the certificate or certificates evidencing shares of Preferred Stock for conversion at the office of the Corporation or the transfer agent for the Preferred Stock or the Common Stock, issue to each holder of such shares, or its nominee or nominees, a certificate or certificates evidencing the number of shares of Common Stock (and any other securities and property) to which it shall be entitled and, in the event that only a part of the shares evidenced by such certificate or certificates are converted, a certificate evidencing the number of shares of Preferred Stock which are not converted. Such conversion shall be deemed to have been made immediately prior to the close of business on the date of such surrender of the shares of Preferred Stock to be converted, except that in the case of an automatic conversion pursuant to Sections 5(a)(iv)(A) and/or 5(a)(v)(A) hereof, such conversion shall be deemed to have been made immediately prior to the closing of the offering referred to in Sections 5(a)(iv)(A) and/or 5(a)(v)(A), or in the case of an automatic conversion pursuant to Sections 5(a)(iv)(B) and/or 5(a)(v)(B) hereof, immediately prior to the close of business on the date of the election referred to in Sections 5(a)(iv)(B) and/or 5(a)(v)(B), and the Person or Persons entitled to receive the shares of Common Stock issuable

upon such conversion shall be treated for all purposes as the record holder or holders of such shares of Common Stock at such date and shall, with respect to such shares, have only those rights of a holder of Common Stock of the Corporation.

(iv) Each share of Series A Preferred Stock then outstanding shall be automatically converted into that number of fully paid and nonassessable shares of Common Stock determined in accordance with the provisions of Section 5(b) below upon the earlier of (A) the close of business of the day immediately preceding the effective date of the Corporation's registration statement filed in connection with a Qualified Public Offering (as defined in Section 6 below) or (B) the consent of the holders of at least a majority of the outstanding shares of Series A Preferred Stock voting or consenting together as a separate class, given in person or by proxy, either in writing or by vote at a meeting called for that purpose at which the holders of Series A Preferred Stock shall vote together as a separate class.

(v) Each share of Series B Preferred Stock and Series B-2 Preferred Stock then outstanding shall be automatically converted into that number of fully paid and nonassessable shares of Common Stock determined in accordance with the provisions of Section 5(b) below upon the earlier of (A) the close of business of the day immediately preceding the effective date of the Corporation's registration statement filed in connection with a Qualified Public Offering (as defined in Section 6 below) or (B) the consent of the holders of at least a majority of the outstanding shares of Series B Preferred Stock and Series B-2 Preferred Stock, voting or consenting together as a single class, given in person or by proxy, either in writing or by vote at a meeting called for that purpose at which the holders of Series B Preferred Stock and Series B-2 Preferred Stock shall vote together as a single class.

(vi) No fractional shares of Common Stock shall be issued upon conversion of the Preferred Stock. In lieu of any fractional shares to which the holder would otherwise be entitled, the Corporation shall pay cash equal to such fraction multiplied by the fair market value of a share of Common Stock as determined in good faith by the Board of Directors of the Corporation. Whether or not fractional shares would be issuable upon such conversion shall be determined on the basis of the total number of shares of Preferred Stock the holder is at the time converting into Common Stock and the aggregate number of shares of Common Stock issuable upon such conversion.

(b) Conversion of Preferred Stock. The Series A Preferred Stock shall be convertible into the number of shares of Common Stock which results from dividing the Conversion Price (as defined herein) per share in effect at the time into $0.25 per share of Series A Preferred Stock being converted. The Series B Preferred Stock shall be convertible into the number of shares of Common Stock which results from dividing the Conversion Price per share in effect at the time into $0.45 per share of Series B Preferred Stock being converted. The Series B-2 Preferred Stock shall be convertible into the number of shares of Common Stock which results from dividing the Conversion Price per share in effect at the time into $0.45 per share of Series B-2 Preferred Stock being converted.

(c) Conversion Price. The conversion price per share for the Series A Preferred Stock shall initially be $0.25 (the "***Series A Conversion Price***") and shall be subject to adjustment from time to time as provided herein. The conversion price per share for the Series B

Preferred Stock shall initially be $0.45 (the "***Series B Conversion Price***") and shall be subject to adjustment from time to time as provided herein. The conversion price per share for the Series B-2 Preferred Stock shall initially be $0.45 (the "***Series B-2 Conversion Price***") and shall be subject to adjustment from time to time as provided herein. Each of the Series A Conversion Price, the Series B Conversion Price and the Series B-2 Conversion Price are sometimes referred to herein as the "***Conversion Price***".

(d) Adjustment for Stock Splits and Combinations. If outstanding shares of the Common Stock of the Corporation shall be subdivided into a greater number of shares, or a dividend in Common Stock or other securities of the Corporation convertible into or exchangeable for Common Stock, shall be paid in respect to the Common Stock of the Corporation, the applicable Conversion Price in effect immediately prior to such subdivision or at the record date of such dividend shall be proportionately reduced, and conversely, if outstanding shares of the Common Stock of the Corporation shall be combined into a smaller number of shares, the applicable Conversion Price in effect immediately prior to such combination shall be proportionately increased.

Any adjustment to a Conversion Price under this Section 5(d) shall become effective at the close of business on the date the subdivision or combination referred to herein becomes effective.

(e) Reorganizations, Mergers, Consolidations or Reclassifications. In the event of any capital reorganization, any reclassification of the Common Stock (other than a change in par value or as a result of a stock dividend, subdivision, split-up or combination of shares), the consolidation or merger of the Corporation with or into another Person (excluding a consolidation or merger described in Section 2(f)(i)(a) of this Article IV) (collectively referred to hereinafter as "***Reorganizations***"), the holders of the Preferred Stock shall thereafter be entitled to receive, and provision shall be made therefor in any agreement relating to a Reorganization, upon conversion of the Preferred Stock the kind and number of shares of Common Stock or other securities or property (including cash) of the Corporation, or other corporation resulting from such consolidation or surviving such merger to which a holder of the number of shares of the Common Stock of the Corporation which the applicable series of Preferred Stock entitled the holder thereof to convert to immediately prior to such Reorganization would have been entitled to receive with respect to such Reorganization; and in any such case appropriate adjustment shall be made in the application of the provisions herein set forth with respect to the rights and interests thereafter of the holders of the Preferred Stock to the end that the provisions set forth herein (including the specified changes and other adjustments to the applicable Conversion Price) shall thereafter be applicable, as nearly as reasonably may be, in relation to any shares, other securities or property thereafter receivable upon conversion of the Preferred Stock. The provisions of this Section 5(e) shall similarly apply to successive Reorganizations.

(f) Sale of Additional Shares.

(i) If at any time or from time to time following the date of the initial issuance of shares of Series B-2 Preferred Stock, the Corporation shall issue or sell (or is deemed to have issued or sold) Additional Shares of Common Stock other than as a dividend or other distribution on any class of stock and other than as a subdivision or combination of shares of

Common Stock as provided in Section 5(d) above, for a consideration per share less than the then existing Series B-2 Conversion Price, then, and in each such case, the then existing Series B-2 Conversion Price shall be reduced, as of the opening of business on the date of such issuance or sale, to the consideration per share received by the Corporation for such issue or deemed issue of the Additional Shares of Common Stock; provided that if such issuance or deemed issuance was without consideration, then the Corporation shall be deemed to have received an aggregate of $0.001 of consideration for all such Additional Shares of Common Stock issued or deemed to be issued; provided, however, that solely with respect to any shares of Series B-2 Preferred Stock issued in exchange for shares of Series B Preferred Stock, the Series B-2 Conversion Price shall not be reduced pursuant to the foregoing, but shall instead be reduced in the manner described in Section 5(f)(ii) below (mutatis mutandis).

(ii) If at any time or from time to time following the date of the initial issuance of shares of Series B-2 Preferred Stock, the Corporation shall issue or sell (or is deemed to have issued or sold) Additional Shares of Common Stock other than as a dividend or other distribution on any class of stock and other than as a subdivision or combination of shares of Common Stock as provided in Section 5(d) above, for a consideration per share less than the then existing Series B Conversion Price, then, and in each such case, the then existing Series B Conversion Price shall be reduced, as of the opening of business on the date of such issuance or sale, to a price determined by multiplying the Series B Conversion Price by a fraction, the numerator of which shall be the number of shares of Common Stock outstanding immediately prior to such issuance (including shares of Common Stock issuable upon conversion of the Series B Preferred Stock and the number of shares of Common Stock which could be obtained through the exercise or conversion of all other rights, options and convertible securities outstanding on the date immediately prior to such issuance) plus the number of shares of Common Stock that the aggregate consideration received by the Corporation for such issuance would purchase at the then existing Series B Conversion Price; and the denominator of which shall be the number of shares of Common Stock outstanding immediately prior to such issuance (including shares of Common Stock issuable upon conversion of the Series B Preferred Stock and the number of shares of Common Stock which could be obtained through the exercise or conversion of all other rights, options and convertible securities outstanding on the date immediately prior to such issuance) plus the number of shares of Additional Shares of Common Stock actually issued in such issuance.

(iii) If at any time or from time to time following the date of the initial issuance of shares of Series B-2 Preferred Stock, the Corporation shall issue or sell (or is deemed to have issued or sold) Additional Shares of Common Stock other than as a dividend or other distribution on any class of stock and other than as a subdivision or combination of shares of Common Stock as provided in Section 5(d) above, for a consideration per share less than the then existing Series A Conversion Price, then, and in each such case, the then existing Series A Conversion Price shall be reduced, as of the opening of business on the date of such issuance or sale, to a price determined by multiplying the Series A Conversion Price by a fraction, the numerator of which shall be the number of shares of Common Stock outstanding immediately prior to such issuance (including shares of Common Stock issuable upon conversion of the Series A Preferred Stock and the number of shares of Common Stock which could be obtained through the exercise or conversion of all other rights, options and convertible securities outstanding on the date immediately prior to such issuance) plus the number of shares of Common Stock that the

aggregate consideration received by the Corporation for such issuance would purchase at the then existing Series A Conversion Price; and the denominator of which shall be the number of shares of Common Stock outstanding immediately prior to such issuance (including shares of Common Stock issuable upon conversion of the Series A Preferred Stock and the number of shares of Common Stock which could be obtained through the exercise or conversion of all other rights, options and convertible securities outstanding on the date immediately prior to such issuance) plus the number of shares of Additional Shares of Common Stock actually issued in such issuance.

(iv) For the purpose of making any adjustment in the applicable Conversion Price, or number of shares of Common Stock issuable upon conversion of the applicable series of Preferred Stock, as provided above, the consideration received by the Corporation for any issue or sale of securities shall:

(a) To the extent it consists of cash, be computed at the net amount of cash received by the Corporation after deduction of any expenses payable directly or indirectly by the Corporation and any underwriting or similar commissions, compensations, discounts or concessions paid or allowed by the Corporation in connection with such issue or sale;

(b) To the extent it consists of property other than cash, the consideration other than cash shall be computed at the fair market value thereof as determined in good faith by the Board of Directors, at or about, but as of, the date of the adoption of the resolution specifically authorizing such issuance or sale, irrespective of any accounting treatment thereof; provided, however, that such fair market value as determined by the Board of Directors, when added to any cash consideration received in connection with such issuance or sale, shall not exceed the aggregate market price of the Additional Shares of Common Stock being issued, as of the date of the adoption of such resolution; and

(c) If Additional Shares of Common Stock, Convertible Securities (as defined below) or Rights (as defined below) are issued or sold together with other stock or securities or other assets of the Corporation for consideration which covers both, the consideration received for the Additional Shares of Common Stock, Convertible Securities or Rights shall be computed as that portion of the consideration so received which is reasonably determined in good faith by the Board of Directors to be allocable to such Additional Shares of Common Stock, Convertible Securities or Rights.

(v) For the purpose of making any adjustment in the applicable Conversion Price provided in Section 5(f) hereof, if at any time, or from time to time, the Corporation issues any stock or other securities convertible into Additional Shares of Common Stock (such stock or other securities being hereinafter referred to as "***Convertible Securities***") or issues any rights or options to purchase Additional Shares of Common Stock or Convertible Securities (such rights or options being hereinafter referred to as "***Rights***"), then, and in each such case, if the Effective Conversion Price (as hereinafter defined) of such Rights or Convertible Securities shall be less than the applicable Conversion Price in effect immediately prior to the issuance of such Rights or Convertible Securities, the Corporation shall be deemed to have issued at the time of the issuance of such Rights or Convertible Securities the maximum number of Additional Shares of Common Stock issuable upon exercise or conversion thereof and

to have received in consideration for the issuance of such shares an amount equal to the aggregate Effective Conversion Price of such Rights or Convertible Securities. For the purposes of this Section 5(f)(v), "***Effective Conversion Price***" shall mean an amount equal to the sum of the lowest amount of consideration, if any, received or receivable by the Corporation with respect to any one (1) Additional Share of Common Stock upon issuance of the Rights or Convertible Securities and upon their exercise or conversion, respectively. No further adjustment of the applicable Conversion Price adjusted upon the issuance of such Rights or Convertible Securities shall be made as a result of the actual issuance of Additional Shares of Common Stock on the exercise of any such Rights or the conversion of any such Convertible Securities. If any such Rights or the conversion privilege represented by any such Convertible Securities shall expire without having been exercised, such applicable Conversion Price, as applicable, as adjusted upon the issuance of such Rights or Convertible Securities shall be readjusted to the Conversion Price, as applicable, which would have been in effect had such adjustment been made on the basis that the only Additional Shares of Common Stock so issued were the Additional Shares of Common Stock, if any, actually issued or sold on the exercise of such Rights or on the conversion of such Convertible Securities, and such Additional Shares of Common Stock, if any, were issued or sold for the consideration actually received by the Corporation upon such exercise, plus the consideration, if any, actually received by the Corporation for the granting of all such Rights, whether or not exercised, plus the consideration received for issuing or selling the Convertible Securities actually converted plus the consideration, if any, actually received by the Corporation (other than by cancellation of liabilities or obligations evidenced by such Convertible Securities) on the conversion of such Convertible Securities. No readjustment pursuant to this subsection (f)(v) shall have the effect of increasing the applicable Conversion Price to an amount which exceeds the lower of (a) the applicable Conversion Price on the original adjustment date and (b) the applicable Conversion Price that would have resulted from any issuance of Additional Shares of Common Stock between the original adjustment date and such readjustment date.

(g) Additional Shares of Common Stock. "**Additional Shares of Common Stock**" as used in this Section 5 shall mean all shares of Common Stock issued or deemed to be issued by the Corporation, whether or not subsequently reacquired or retired by the Corporation, other than:

(i) shares of Series B-2 Preferred Stock and warrants to purchase shares of Series B-2 Preferred Stock issued pursuant to the Purchase Agreement;

(ii) shares of Common Stock issued upon the conversion of, or as a dividend or distribution on, any shares of the Corporation's Preferred Stock;

(iii) shares of Common Stock issued or issuable to employees or officers or directors or outside consultants or contractors of the Corporation or any Subsidiary pursuant the exercise or conversion of options, warrants or other Convertible Securities issued pursuant to a plan, agreement or arrangement duly approved by the Board of Directors;

(iv) shares of Common Stock issued or issuable pursuant to the exercise or conversion of options, warrants or other Convertible Securities outstanding as of the date hereof;

(v) shares of Common Stock issued pursuant to a Qualified Public Offering;

(vi) shares of Common Stock issued to effect any stock split, stock dividend or recapitalization of the Corporation;

(vii) shares of Common Stock and/or options, warrants or other Common Stock purchase rights issued in connection with the Corporation obtaining lease financing, whether issued to a lessor, guarantor or other Person, provided that such issuance is pursuant to an agreement or arrangement duly approved by the Board of Directors;

(viii) shares of Common Stock and/or options, warrants or other Common Stock purchase rights issued in connection with any borrowings, direct or indirect, from a bank or other financial institution by the Corporation, provided that such issuance is pursuant to an agreement or arrangement duly approved by the Board of Directors;

(ix) shares of Common Stock and/or options, warrants or other Common Stock purchase rights issued in connection with the acquisition of all or a substantial portion of the assets or the business of another entity by the Corporation, provided that such issuance is pursuant to an agreement or arrangement duly approved by the Board of Directors; and

(x) shares of Common Stock and/or options, warrants or other Common Stock purchase rights issued in connection with any corporate partnering transaction, strategic alliance, technology transfer or similar transaction between the Corporation and any other Person, provided that such issuance is pursuant to an agreement or arrangement duly approved by the Board of Directors.

(h) Common Stock. "***Common Stock***" as used in this Section 5 shall mean any shares of any class of the Corporation's capital stock other than the Preferred Stock. The Common Stock issuable upon conversion of the Preferred Stock, however, shall be the Common Stock of the Corporation as constituted on the date hereof, except as otherwise provided in this Section 5.

(i) Certificate of Adjustment. In each case of an adjustment or readjustment of the Conversion Price or the number of shares of Common Stock or other securities issuable upon conversion of any series of Preferred Stock, the Corporation, at its expense, shall cause the Chief Financial Officer or Treasurer of the Corporation to compute such adjustment or readjustment in accordance with this Amended and Restated Certificate of Incorporation and prepare a certificate showing such adjustment or readjustment, and shall mail such certificate, by first-class mail, postage prepaid, to each registered holder of such Preferred Stock at the holder's address as shown on the Corporation's stock transfer books. The certificate shall set forth such adjustment or readjustment, showing in detail the facts upon which such adjustment or readjustment is based, including a statement of (i) the consideration received or to be received by the Corporation for any Additional Shares of Common Stock issued or sold or deemed to have been issued or sold; (ii) the applicable Conversion Price at the time in effect for such Preferred Stock; and (iii) the number of Additional Shares of Common Stock and the type and amount, if

any, of other property which at the time would be received upon conversion of such Preferred Stock. Such notice may be given in advance of such adjustment or readjustment and may be included as part of a notice required to be given pursuant to Section 5(j) below.

(j) Notices of Record Date. In the event the Corporation shall propose to take any action of the type or types requiring an adjustment to the Conversion Price of any series of Preferred Stock, or the number or character of such Preferred Stock as set forth herein, the Corporation shall give notice to the holders of such Preferred Stock as applicable in the manner set forth in Section 5(i) above, which notice shall specify the record date, if any, with respect to any such action and the date on which such action is to take place. Such notice shall also set forth such facts with respect thereto as shall be reasonably necessary to indicate the effect of such action (to the extent such effect may be known at the date of such notice) on the Conversion Price and the number, kind or class of shares or other securities or property which shall be deliverable upon the occurrence of such action or deliverable upon the conversion of the Preferred Stock. In the case of any action which would require the fixing of a record date, such notice shall be given at least ten (10) days prior to the date so fixed, and in case of all other action, such notice shall be given at least twenty (20) days prior to the taking of such proposed action. Notwithstanding the requirements of this Section 5(j), this Section 5(j) shall not be applicable and no such notice shall be required with respect to any action that is, or has been, approved by the Requisite Holders.

(k) Reservation of Stock Issuable Upon Conversion. The Corporation shall at all times reserve and keep available out of its authorized but unissued shares of Common Stock, solely for the purpose of effecting the conversion of the shares of Preferred Stock, such number of its shares of Common Stock as shall from time to time be sufficient to effect a conversion of all outstanding shares of Preferred Stock, and if at any time the number of authorized but unissued shares of Common Stock shall not be sufficient to effect the conversion of all then outstanding shares of Preferred Stock, the Corporation shall promptly seek such corporate action as may, in the opinion of its counsel, be necessary to increase its authorized but unissued shares of Common Stock to such number of shares as shall be sufficient for such purpose. In the event of the consolidation or merger of the Corporation with another corporation where the Corporation is not the surviving corporation, effective provisions shall be made in the certificate or articles of incorporation, merger or consolidation, or otherwise of the surviving corporation so that such corporation will at all times reserve and keep available a sufficient number of shares of Common Stock or other securities or property to provide for the conversion of Preferred Stock in accordance with the provisions of this Section 5.

(l) Payment of Taxes. The Corporation shall pay all taxes and other governmental charges (other than any income or other taxes imposed upon the profits realized by the recipient) that may be imposed in respect of the issue or delivery of shares of Common Stock or other securities or property upon conversion of shares of Preferred Stock, excluding any tax or other charge imposed in connection with any transfer involved in the issue and delivery of shares of Common Stock or other securities in a name other than that in which the shares of Preferred Stock so converted were registered.

(m) Status of Converted Stock. In the event any shares of Preferred Stock shall be converted pursuant to Section 5 hereof, the shares so converted shall be canceled and

shall not be issuable by the Corporation, and this Amended and Restated Certificate of Incorporation shall be appropriately amended to effect the corresponding reduction in the Corporation's authorized capital stock.

(n) No Impairment. Subject to the right of this Corporation to amend its Certificate of Incorporation or take any other corporate action upon obtaining the necessary approvals required by its Certificate of Incorporation and applicable law, the Corporation shall not amend this Amended and Restated Certificate of Incorporation or participate in any reorganization, transfer of assets, consolidation, merger, dissolution, issue or sale of securities or any other voluntary action, for the purpose of avoiding or seeking to avoid the observance or performance of any of the terms to be observed or performed hereunder by the Corporation, but shall at all times in good faith use its best efforts, and assist in carrying out all such action as may be reasonably necessary or appropriate in order to protect the Conversion Rights of the holders of the Preferred Stock against dilution or other impairment.

6. Miscellaneous.

(a) Definitions.

(i) "***Additional Shares of Common Stock***" shall have that meaning set forth in Section 5(g) hereof.

(ii) "***Common Stock***" shall have that meaning set forth in Section 5(h) hereof.

(iii) "***Conversion Price***" shall have that meaning set forth in Section 5(c) hereof.

(iv) "C***onversion Rights***" shall have that meaning set forth in Section 5 hereof.

(v) "***Convertible Securities***" shall have that meaning set forth in Section 5(f)(v) hereof.

(vi) "***Effective Conversion Price***" shall have that meaning set forth in Section 5(f)(v) hereof.

(vii) "***Liquidation Value***" shall have that meaning set forth in Section 2(e) hereof.

(viii) "***Person***" shall mean an individual, a corporation, a partnership, a trust or unincorporated organization or any other entity or organization.

(ix) "***Preferred Stock***" shall have that meaning set forth in the first paragraph of this Article IV.

(x) "***Purchase Agreement***" means that certain Series B-2 Preferred Stock and Warrant Purchase Agreement, dated on or about the date of the filing of this Amended

and Restated Certificate of Incorporation, by and among the Corporation and the Persons party thereto, as the same may be amended, restated or otherwise modified from time to time in accordance with the terms thereof.

(xi) "***Qualified Public Offering***" means a firmly underwritten public offering of the Corporation's Common Stock on a Form S-1 Registration Statement, or any similar form of registration statement, adopted by the Securities and Exchange Commission (the "Commission") from and after the date hereof, filed with the Commission under the Securities Act of 1933, as amended, with respect to which the Corporation receives gross proceeds of at least $25,000,000 (prior to deduction for underwriters' discounts and expenses relating to such public offering, including without limitation, fees of the Corporation's counsel) and the price to the public is at least $1.35 per share (equitably adjusted for all stock splits, sub-divisions, stock dividends, combinations and the like with respect to such shares).

(xii) "***Requisite Holders***" shall mean the holders of at least (i) a majority of the then outstanding shares of Series A Preferred Stock, voting or acting by written consent together as a separate class, (ii) a majority of the then outstanding shares of Series B Preferred Stock, voting or acting by written consent together as a separate class, and (iii) a majority of the then outstanding shares of Series B-2 Preferred Stock, voting or acting by written consent together as a separate class.

(xiii) "***Series A Conversion Price***" shall have that meaning set forth in Section 5(c) hereof.

(xiv) "***Series A Preferred Stock***" shall have that meaning set forth in the first paragraph of this Article IV.

(xv) "***Series B Conversion Price***" shall have that meaning set forth in Section 5(c) hereof.

(xvi) "***Series B Preferred Stock***" shall have that meaning set forth in the first paragraph of this Article IV.

(xvii) "***Series B-2 Conversion Price***" shall have that meaning set forth in Section 5(c) hereof.

(xviii) "***Series B-2 Preferred Stock***" shall have that meaning set forth in the first paragraph of this Article IV.

(xix) "***Subsidiary***" means any Person of which equity securities possessing a majority of the ordinary voting power in electing the board of directors are, at the time as of which such determination is being made, owned by the Corporation either directly or indirectly through one or more Subsidiaries.

(b) Notices. All notices referred to herein, except as otherwise expressly provided, shall be made by registered or certified mail, return receipt requested, postage prepaid and shall be deemed to have been given when so mailed.

(c) Conflicts. So long as any of the Preferred Stock is outstanding, in the event of any conflict between the provisions of this Article IV and the remainder of this Amended and Restated Certificate of Incorporation or the Bylaws of the Corporation (both as presently existing or hereafter amended and supplemented), the provisions of this Article IV shall be and remain controlling.

C. Common Stock. The rights, preferences, privileges and restrictions granted to and imposed on the Common Stock are as set forth below in this Article IV C.

1. Dividends. Subject to the prior rights of holders of all classes of stock at the time outstanding having prior rights as to dividends, the holders of the Common Stock shall be entitled to receive, when, as and if declared by the Board of Directors, out of any assets of this Corporation legally available therefor, any dividends as may be declared from time to time by the Board of Directors.

2. Liquidation Rights. Upon the liquidation, dissolution or winding up of this Corporation, the assets of this Corporation shall be distributed as provided in Section 2 of Article IV B hereof.

3. Redemption. The Common Stock is not redeemable at the option of the holder.

4. Voting Rights. The holder of each share of Common Stock shall have the right to one (1) vote for each such share, and shall be entitled to notice of any stockholders' meeting in accordance with the Bylaws of this Corporation, and shall be entitled to vote upon such matters and in such manner as may be provided by this Amended and Restated Certificate of Incorporation and law; provided, however, that, except as otherwise required by law, holders of Common Stock, as such, shall not be entitled to vote on any amendment to the Restated Certificate that relates solely to the terms of one or more outstanding series of Preferred Stock if the holders of such affected series are entitled, either separately or together with the holders of one or more other such series, to vote thereon pursuant to the Restated Certificate or pursuant to the General Corporation Law. The number of authorized shares of Common Stock may be increased or decreased (but not below the number of shares thereof then outstanding) by the affirmative vote of the holders of a majority of the stock of this Corporation entitled to vote, irrespective of the provisions of Section 242(b)(2) of the General Corporation Law.

5. Directors. The holders of outstanding Common Stock shall be entitled to elect directors as provided in subsection 4(b) of Article IV B.

ARTICLE V.

Except as otherwise provided in this Amended and Restated Certificate of Incorporation, in furtherance and not in limitation of the powers conferred by statute, the Board is expressly authorized to make, repeal, alter, amend and rescind any or all of the Bylaws of this Corporation.

ARTICLE VI.

Subject to any additional vote required by this Amended and Restated Certificate of Incorporation, the number of directors of this Corporation shall be determined in the manner set forth in the Bylaws of this Corporation.

ARTICLE VII.

Elections of directors need not be by written ballot unless the Bylaws of this Corporation shall so provide.

ARTICLE VIII.

Meetings of stockholders may be held within or without the State of Delaware, as the Bylaws of this Corporation may provide. The books of this Corporation may be kept (subject to any provision contained in the statutes) outside the State of Delaware at such place or places as may be designated from time to time by the Board or in the Bylaws of this Corporation.

ARTICLE IX.

To the fullest extent permitted by the General Corporation Law, a director of this Corporation shall not be personally liable to this Corporation or its stockholders for monetary damages for breach of fiduciary duty as a director. If the General Corporation Law is amended after approval by the stockholders of this Article IX to authorize corporate action further eliminating or limiting the personal liability of directors, then the liability of a director of this Corporation shall be eliminated or limited to the fullest extent permitted by the General Corporation Law as so amended.

Any amendment, repeal or modification of the foregoing provisions of this Article IX by the stockholders of this Corporation shall not adversely affect any right or protection of a director of this Corporation existing at the time of, or increase the liability of any director of this Corporation with respect to any acts or omissions of such director occurring prior to, such amendment, repeal or modification.

ARTICLE X.

This Corporation reserves the right to amend, alter, change or repeal any provision contained in this Amended and Restated Certificate of Incorporation, in the manner now or hereafter prescribed by statute, and all rights conferred upon stockholders herein are granted subject to this reservation.

ARTICLE XI.

This Corporation shall have the power to indemnify (and advance expenses to), to the fullest extent permitted by the General Corporation Law, as it presently exists or may hereafter be amended from time to time, any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative (a "***Proceeding***") by reason of the fact that he or she is or was a director, officer, employee or agent of this Corporation or is or was serving at the request of this Corporation as a director, officer, employee or agent of another corporation,

partnership, joint venture, trust or other enterprise, including service with respect to employee benefit plans, against expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by such person in connection with any such Proceeding, including in excess of the indemnification and advancement otherwise permitted by Section 145 of the General Corporation Law.

Any amendment, repeal or modification of the foregoing provisions of this Article XI shall not adversely affect any right or protection of a director, officer, employee, agent or other person existing at the time of, or increase the liability of any such person with respect to any acts or omissions of such person occurring prior to, such amendment, repeal or modification.

ARTICLE XII.

To the fullest extent permitted by applicable law, this Corporation renounces any interest or expectancy of this Corporation in, or in being offered an opportunity to participate in, an Excluded Opportunity; provided, that nothing herein is intended to diminish the fiduciary duties of any director of this Corporation. An "***Excluded Opportunity***" is any matter, transaction or interest that is presented to, or acquired, created or developed by, or which otherwise comes into the possession of, (i) any director of this Corporation who is not an employee of this Corporation or any of its subsidiaries, or (ii) any holder of Preferred Stock, any Affiliate of such holder, or any partner, member, director, stockholder, employee or agent of any such holder or Affiliate, in each case other than someone who is an employee of this Corporation or any of its subsidiaries (collectively, "***Covered Persons"),*** unless such matter, transaction or interest is presented to, or acquired, created or developed by, or otherwise comes into the possession of, a Covered Person expressly and solely in such Covered Person's capacity as a director of this Corporation.

ARTICLE XIII.

In connection with repurchases by this Corporation of its Common Stock from employees, officers, directors, advisors, consultants or other persons performing services for this Corporation or any subsidiary pursuant to agreements under which this corporation has the option to repurchase such shares at cost upon the occurrence of certain events, such as the termination of employment, Section 500 of the California Corporations Code shall not apply in all or in part with respect to such repurchases. In the case of any such repurchases, distributions by this Corporation may be made without regard to the "preferential dividends arrears amount" or any "preferential rights amount," as such terms are defined in Section 500(b) of the California Corporations Code.

* * *

THIRD: The foregoing amendment and restatement was approved by the holders of the requisite number of shares of said corporation in accordance with Section 228 of the General Corporation Law.

FOURTH: That said Amended and Restated Certificate of Incorporation, which restates and integrates and further amends the provisions of this corporation's Certificate of

Incorporation, has been duly adopted in accordance with Sections 242 and 245 of the General Corporation Law.

IN WITNESS WHEREOF, this Amended and Restated Certificate of Incorporation has been executed by a duly authorized officer of this corporation on this 8th day of September, 2017.

By: /s/ James B. Breitmeyer
Name: James B. Breitmeyer, M.D., Ph.D.
Title: President and CEO

EXHIBIT C

PATENT RIGHTS

[***]

EXHIBIT D

BIOSITE SERVICE AGREEMENT OBLIGATIONS

EXHIBIT A

COMMERCIALIZATION TERMS

Because Institution is committed to being a center of excellence in research, it will not directly commercialize the products resulting from the research, and must rely on third parties for development and eventual commercialization. The following terms and conditions shall apply in the event that Institution, directly or through one or more Licensees (as defined below), elects to develop a Product (as defined below) for commercialization:

1. Definitions. For purposes of this Exhibit A, the terms defined in this Section 1 shall have the respective meanings set forth below. All capitalized terms not defined below shall have the respective meanings set forth in Section 1 of the Agreement.

1.1 "First Commercial Sale" shall mean, with respect to any Product and any country, the first sale of such Product by Institution, its licensee or their respective Affiliates to customers who are not Affiliates in such country after all applicable marketing and pricing approvals (if any) have been granted by the applicable governing health authority of such country.

1.2 "License Agreement" means an agreement into which Institution enters with a Third Party ("Licensee(s)"), for the purpose of (i) granting certain rights, (ii) granting an option to certain rights, or (iii) forbearing the exercise of any rights to (a) use a method or composition or perform a service which would otherwise infringe, induce to infringe or contribute to infringement, of any pending or issued claim within patents that are assigned to Institution and claim an Antibody or the use thereof; or (b) make, use or sell Products (whether or not there exist any patents that claim such Products or the use thereof).

1.3 "Net Sales" shall mean, with respect to any Product, the gross sales price of such Product invoiced by Institution's Licensees or their respective Affiliates to customers who are not Affiliates (or are Affiliates but are the end users of such Product) less, to the extent actually paid or accrued by the selling party, (a) credits, allowances, discounts and rebates to, and chargebacks from the account of, such customers for spoiled, damaged, ou-tdated and returned Product; (b) freight and insurance costs incurred by the selling party in transporting such Product in final form to such customers; (c) cash, quantity and trade discounts, rebates and other price reductions for such Product given to such customers under price reduction programs that are consistent with industry practices and price reductions given for similar products by such selling party; (d) sales taxes incurred on the sale of such selling party in final form to such customers; and (e) customs duties, surcharges and other governmental charges incurred in exporting or importing such Product in final form to such customers.

1.4 "Phase I Clinical Trial" shall mean a human clinical trial in any country that is intended to initially evaluate the safety and/or pharmacological effect of a Product in subjects or that would otherwise satisfy requirements of 21 CFR 312.21(a), or its foreign equivalent;

1.5 "Phase II Clinical Trial" shall mean a human clinical trial in any country that is intended to initially evaluate the effectiveness of a Product for a particular indication or indications in patients with the disease or indication under study or that would otherwise satisfy requirements of 21 CFR 312.21(b), or its foreign equivalent; and

1.6 "Phase III Clinical Trial" shall mean a pivotal human clinical trial in any country the results of which could be used to establish safety and efficacy of a Product as a basis for a BLA or that would otherwise satisfy requirements of 21 CFR 312.21(c), or its foreign equivalent.

1.7 "Product" shall mean a product that directly or indirectly incorporates, contains, uses, is based on or is derived from the Antibody or Antibody Fragment for the Target or the results of the use of the Antibodies.

2. CONSIDERATION

2.1 Milestone Payments. The Institution shall require its Licensees to pay to Biosite the following milestone payments with respect to each Product:

[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]

2.2 Royalties. For a period twelve (12) years after the First Commercial Sale of each Product in each country, Institution shall require its Licensees to pay to Biosite [***] of Net Sales by such Licensees, their licensees and their respective Affiliates of such Product in such country. Biosite shall be the third party beneficiary of such License Agreements.

3. PAYMENT REPORTS AND PAYMENT TERMS

3.1 Payment Reports. Within ninety (90) days after the end of each June 30th following the First Commercial Sale of a Product by the Licensees or their sublicensees, Institution or its Licensees shall furnish to Biosite a written report showing in reasonably specific detail, on a Product-by-Product and country-by-country basis, (a) the gross sales of all Products sold by the Licensees, their sublicensees and their respective Affiliates during the twelve (12) months preceding such June 30th and the calculation of Net Sales from such gross sales; (b) the calculation of royalties, if any, that shall have accrued based upon such Net Sales; (c) the withholding taxes, if any, required by law to be deducted with respect to such sales; and (d) the exchange rates, if any, used in determining the amount of United States dollars. With respect to revenues received by the Licensees, their sublicensees or their respective Affiliates and invoiced in United States dollars, all such amounts shall be expressed in United States dollars. With respect to Net Sales of Products by the Licensees, their sublicensees or their respective Affiliates and invoiced in a currency other than United States dollars, all such amounts shall be converted into their equivalent dollar value using such party's standard accounting procedures and conversion methodology, which shall be consistent with Generally Accepted Accounting Principles. Institution, its Licensees, their sublicensees and their respective Affiliates shall keep complete and accurate records in sufficient detail to enable the amounts payable hereunder to be determined.

3.2 Audits. Upon the written request of Biosite and not more than once in each calendar year, Institution and the Licensees shall permit an independent certified public accounting firm of nationally recognized standing, selected by Biosite and reasonably acceptable to Institution, at

Biosite's expense, to have access during normal business hours to such of the records of Institution and the Licensees that Biosite has not had audited previously under this Agreement as may be reasonably necessary to verify the accuracy of the payment reports hereunder for any year ending not more than twenty-four (24) months prior to the date of such request. If such accounting firm concludes that additional amounts were owed during the audited period, Institution shall pay such additional amounts within thirty (30) days of the date Biosite delivers to Institution such accounting firm's written report so concluding. The fees charged by such accounting firm shall be paid by Biosite; provided, however, if the audit discloses that the royalties payable by Institution for such period are more than [***] of the royalties actually paid for such period, then Institution shall pay the reasonable fees and expenses charged by such accounting firm. Biosite shall cause its accounting firm to retain all financial information subject to review under this Section 3.2 in strict confidence; provided, however, that Institution shall have the right to require that such accounting firm, prior to conducting such audit, enter into an appropriate non-disclosure agreement with Institution regarding such financial information. The accounting firm shall disclose to Biosite only whether the reports are correct or not and the amount of any discrepancy. No other information shall be shared. Biosite shall treat all such financial information as Institution's Confidential Information (as defined in Section 4.1 of the Agreement).

3.3 Payment Terms.

3.3.1 Milestones. All amounts payable under Section 2.1 of this Exhibit A shall be payable within ninety (90) days of the first June 30th following the occurrence of the applicable event. Payment of amounts in whole or in part may be made in advance of such due dates.

3.3.2 Royalties. All amounts payable as indicated by each payment report provided for under Section 3.1 of this Exhibit shall be payable within ninety (90) days of June 30th of each year under this Agreement and for the period ending on those dates during the term of this Agreement. Payment of amounts in whole or in part may be made in advance of such due dates.

3.3.3 Payment Method. All payments by a party to the other party under this Agreement shall be paid in United States dollars and all such payments shall be originated from a United States bank located in the United States and made by bank wire transfer in immediately available funds to such account as the payee shall designate before such payment is due.

4. INDEMNITY

4.1 Indemnity. Institution shall, and shall require its Licensees to, indemnify and hold Biosite harmless, and hereby forever releases and discharges Biosite, from and against all losses, liabilities, damages and expenses (including reasonable attorneys' fees and costs) resulting from all claims, demands, actions and other proceedings by any Third Party to the extent arising from (a) the use of the Antibodies or the making, using or selling of Products by Institution, its Licensees or their Affiliates or sublicensees, (b) the use of any Target, or the development, sale or delivery of an Antibody to the extent it is specific to any Target, by Biosite in performing the Services, or (c) the gross negligence or willful misconduct of Institution, its Licensees or their Affiliates or sublicensees in the performance of its obligations, and its permitted activities, under this Agreement. Notwithstanding any other provision of this paragraph, Institution indemnifies Biosite hereunder, only in proportion to and to the extent that all losses, liabilities, damages and expenses (including reasonable attorneys' fees and costs) is caused by Institution, it directors, officers and

employees. Additionally, Institution will require the same level of indemnification for Biosite in its commercial licenses, if any, arising from the Services hereunder as Institution obtains for itself.

4.2 Procedure. Biosite shall promptly notify Institution of any claim, demand, action or other proceeding for which Biosite intends to claim such indemnification. Institution shall have the right to participate in, and to the extent it so desires jointly with any other indemnitor similarly noticed, to assume the defense thereof with counsel selected by Institution; provided, however, that Biosite shall have the right to retain its own counsel, with the fees and expenses to be paid by Institution, if representation of Biosite by the counsel retained by Institution would be inappropriate due to actual or potential differing interests between Biosite and any other party represented by such counsel in such proceedings. Institution may not settle or otherwise consent to an adverse judgment in any such claim, demand, action or other proceeding that diminishes the rights or interests of Biosite without the prior express written consent of Biosite, which consent shall not be unreasonably withheld or delayed. Biosite, its employees and agents, shall reasonably cooperate with Institution and its legal representatives in the investigation of any claim, demand, action or other proceeding covered by this Section 4.

4.3 Insurance. Institution or its Licensees hereunder shall maintain such insurance with respect to the development, manufacture and sales of Products by Institution, its Affiliates or Licensees in such amounts as Institution, or its Licensees hereunder, customarily maintains with respect to the development, manufacture and sales of its other products. Institution or its Licensees hereunder shall maintain such insurance for so long as it continues to develop, manufacture or sell Products, and thereafter for so long as it customarily maintains insurance for itself covering the development, manufacture and sales of its other products. Biosite shall maintain liability insurance with financially sound and reputable insurers with insurance coverage against loss from such risks and in such amounts as is customary for well-insured companies or institutions engaged in similar businesses or services, including comprehensive liability coverage with contractual liability coverage sufficient to cover its indemnification obligations under this Agreement.

***CERTAIN MATERIAL (INDICATED BY THREE ASTERISKS IN BRACKETS) HAS BEEN OMITTED FROM THIS DOCUMENT BECAUSE IT IS BOTH (1) NOT MATERIAL AND (2) WOULD BE COMPETITIVELY HARMFUL IF PUBLICLY DISCLOSED.

AMENDMENT NO. 1
TO AMENDED AND RESTATED LICENSE AGREEMENT
BETWEEN ONCTERNAL THERAPEUTICS, INC.
AND THE REGENTS OF THE UNIVERSITY OF CALIFORNIA
FOR UC CASE NOS. SD2005-212, SD2010-306, SD2011-178, SD2012-143, SD2012-403, SD2015-027 AND SD2015-200

This Amendment No. 1 ("Amendment No. 1") is made by and between Oncternal Therapeutics, Inc. having an address at 3525 Del Mar Heights Road, #821, San Diego, California 92130 ("Oncternal") and The Regents of the University of California, a California public corporation having its statewide administrative offices at 1111 Franklin Street, Oakland, California 94607-5200 ("University"), represented by its San Diego campus having an address at University of California San Diego, Office of Innovation and Commercialization ("OIC"), Mail Code 0910, 9500 Gilman Drive, La Jolla, California 92093-0910 ("UC San Diego"). Capitalized terms used herein and not otherwise defined have the meanings ascribed to them in the Agreement.

WHEREAS, Oncternal and University entered into a license agreement ("Agreement"), UC Control Number 2019-03-0137, effective August 31, 2018 ("Effective Date");

WHEREAS, Oncternal and University wish to amend the Agreement to make certain corrections;

NOW THEREFORE, in consideration of the foregoing premises and the mutual covenants set forth below, the parties amend the Agreement and otherwise agree as follows:

I. Exhibit C in the Agreement shall be deleted in its entirety and replaced with the amended Exhibit C as shown in the pages following the signatures executing this Amendment #1.

All other terms and conditions of Agreement shall remain unchanged and in full force and effect. This Amendment No. 1 shall be governed by, and construed in accordance with, the laws of California which govern the Agreement. This Amendment No. 1 is effective as of the date of the last signature below ("Amendment No. 1 Effective Date").

University and Oncternal agree that this Amendment No. 1 may be executed by facsimile and in two (2) or more counterparts, each of which shall be deemed an original and all of which together shall constitute but one and the same instrument.

[Signature Page Follows]

IN WITNESS WHEREOF, both University and Oncternal have executed this Amendment No.1, in duplicate originals, by their respective and duly authorized officers on the day and year written.

ONCTERNAL THERAPEUTICS, INC.:	**THE REGENTS OF THE UNIVERSITY OF CALIFORNIA:**
By: /s/ James Breitmeyer	By: /s/ David Gibbons
(Signature)	(Signature)
Name: James Breitmeyer, M.D., Ph.D.	David Gibbons
Title: President & CEO	Assistant Director
Date: 22 MAR 2019	Date: 25 MAR 2019

EXHIBIT C

PATENT RIGHTS

[***]

ONCTERNAL THERAPEUTICS, INC.

2015 EQUITY INCENTIVE PLAN

1. ***Purpose***.

The purpose of the Plan is to advance the interests of the Company's stockholders by enhancing the Company's ability to attract, retain and motivate persons who make (or are expected to make) important contributions to the Company by providing such persons with equity ownership opportunities and thereby better aligning the interests of such persons with those of the Company's stockholders. Capitalized terms used in the Plan are defined in Section 11 below.

2. ***Eligibility***.

Service Providers are eligible to be granted Awards under the Plan, subject to the limitations described herein.

3. ***Administration and Delegation***.

(a) *Administration.* The Plan will be administered by the Administrator. The Administrator shall have authority to determine which Service Providers will receive Awards, to grant Awards and to set all terms and conditions of Awards (including, but not limited to, vesting, exercise and forfeiture provisions). In addition, the Administrator shall have the authority to take all actions and make all determinations contemplated by the Plan and to adopt, amend and repeal such administrative rules, guidelines and practices relating to the Plan as it shall deem advisable. The Administrator may correct any defect or ambiguity, supply any omission or reconcile any inconsistency in the Plan or any Award in the manner and to the extent it shall deem necessary or appropriate to carry the Plan and any Awards into effect, as determined by the Administrator. The Administrator shall make all determinations under the Plan in the Administrator's sole discretion and all such determinations shall be final and binding on all persons having or claiming any interest in the Plan or in any Award.

(b) *Appointment of Committees.* To the extent permitted by Applicable Laws, the Board may delegate any or all of its powers under the Plan to one or more Committees. The Board may abolish any Committee at any time and re-vest in itself any previously delegated authority.

4. ***Stock Available for Awards***.

(a) *Number of Shares.* Subject to adjustment under Section 8 hereof, Awards may be made under the Plan covering up to 2,000,000 shares of Common Stock. If any Award expires or lapses or is terminated, surrendered or canceled without having been fully exercised or is forfeited in whole or in part (including as the result of shares of Common Stock subject to such Award being repurchased by the Company at or below the original issuance price), in any case in a manner that results in any shares of Common Stock covered by such Award not being issued or being so reacquired by the Company, the unused Common Stock covered by such Award shall again be available for the grant of Awards under the Plan. Further, shares of Common Stock delivered (either by actual delivery or attestation) to the Company by a Participant to satisfy the applicable exercise or purchase price of Award and/or to satisfy any applicable tax withholding obligation (including shares retained by the Company from the Award being exercised or purchased and/or creating the tax obligation) shall be added to the number of shares of Common Stock available for the grant of Awards under the Plan. However, in the case of Incentive Stock Options (as hereinafter defined), the foregoing provisions shall be subject to any limitations under the Code. Shares of Common Stock issued under the Plan may consist in whole or in part of authorized but unissued shares, shares purchased on the open market or treasury shares.

(b) *Substitute Awards*. In connection with a merger or consolidation of an entity with the Company or the acquisition by the Company of property or stock of an entity, the Administrator may grant Awards in substitution for any options or other stock or stock-based awards granted prior to such merger or consolidation by such entity or an affiliate thereof. Substitute Awards may be granted on such terms as the Administrator deems appropriate in the circumstances, notwithstanding any limitations on Awards contained in the Plan. Substitute Awards shall not count against the overall share limit set forth in Section 4(a) hereof, except as may be required by reason of Section 422 of the Code.

5. ***Stock Options***.

(a) *General.* The Administrator may grant Options to any Service Provider, subject to the limitations on Incentive Stock Options described below. The Administrator shall determine the number of shares of Common Stock to be covered by each Option, the exercise price of each Option and the conditions and limitations applicable to the exercise of each Option, including conditions relating to Applicable Laws, as it considers necessary or advisable.

(b) *Incentive Stock Options.* The Administrator may grant Options intended to qualify as Incentive Stock Options only to employees of the Company, any of the Company's present or future "parent corporations" or "subsidiary corporations" as defined in Sections 424(e) or (f) of the Code, respectively, and any other entities the employees of which are eligible to receive Incentive Stock Options under the Code. All Options intended to qualify as Incentive Stock Options shall be subject to and shall be construed consistently with the requirements of Section 422 of the Code. Neither the Company nor the Administrator shall have any liability to a Participant, or any other party, (i) if an Option (or any part thereof) which is intended to qualify as an Incentive Stock Option fails to qualify as an Incentive Stock Option or (ii) for any action or omission by the Administrator that causes an Option not to qualify as an Incentive Stock Option, including without limitation, the conversion of an Incentive Stock Option to a Non-Qualified Stock Option or the grant of an Option intended as an Incentive Stock Option that fails to satisfy the requirements under the Code applicable to an Incentive Stock Option. Any Option that is intended to qualify as an Incentive Stock Option, but fails to so qualify for any reason, including without limitation, the portion of any Option becoming exercisable in excess of the $100,000 limitation described in Treasury Regulation Section 1.422-4, shall be treated as a Non-Qualified Stock Option for all purposes.

(c) *Exercise Price.* The Administrator shall establish the exercise price of each Option and specify the exercise price in the applicable Award Agreement. The exercise price shall be not less than 100% of the Fair Market Value on the date the Option is granted. In the case of an Incentive Stock Option granted to an employee who, at the time of grant of the Option, owns (or is treated as owning under Section 424 of the Code) stock representing more than 10% of the voting power of all classes of stock of the Company (or a "parent corporation" or "subsidiary corporation" thereof within the meaning of Sections 424(e) or 424(f) of the Code, respectively), the per share exercise price shall be no less than 110% of the Fair Market Value on the date the Option is granted.

(d) *Duration of Options.* Each Option shall be exercisable at such times and subject to such terms and conditions as the Administrator may specify in the applicable Award Agreement, provided that the term of any Option shall not exceed ten years. In the case of an Incentive Stock Option granted to an employee who, at the time of grant of the Option, owns (or is treated as owning under Section 424 of the Code) stock representing more than 10% of the voting power of all classes of stock of the Company (or a "parent corporation" or "subsidiary corporation" thereof within the meaning of Sections 424(e) or 424(f) of the Code, respectively), the term of the Option shall not exceed five years.

(e) *Exercise of Option; Notification of Disposition.* Options may be exercised by delivery to the Company of a written notice of exercise, in a form approved by the Administrator (which may be an electronic form), signed by the person authorized to exercise the Option, together with payment in full (i) as specified in Section 5(f) hereof for the number of shares for which the Option is exercised and (ii) as specified in Section 9(e) hereof for any applicable withholding taxes. Unless otherwise determined by the Administrator, an Option may not be exercised for a fraction of a share of Common Stock. If an Option is designated as an Incentive Stock Option, the Participant shall give prompt notice to the Company of any disposition or other transfer of any shares of Common Stock acquired from the Option if such disposition or transfer is made (i) within two years from the grant date with respect to such Option or (ii) within one year after the transfer of such shares to the Participant (other than any such disposition made in connection with a Change in Control). Such notice shall specify the date of such disposition or other transfer and the amount realized, in cash, other property, assumption of indebtedness or other consideration, by the Participant in such disposition or other transfer.

(f) *Payment Upon Exercise.* Common Stock purchased upon the exercise of an Option granted under the Plan shall be paid for in cash or by check, payable to the order of the Company, or, to the extent permitted by the Administrator, by:

(i) (A) delivery of an irrevocable and unconditional undertaking by a broker acceptable to the Company to deliver promptly to the Company sufficient funds to pay the exercise price and any required tax withholding, or (B) delivery by the Participant to the Company of a copy of irrevocable and unconditional instructions to a broker acceptable to the Company to deliver promptly to the Company cash or a check sufficient to pay the exercise price and any required tax withholding;

(ii) delivery (either by actual delivery or attestation) of shares of Common Stock owned by the Participant valued at their Fair Market Value, provided (A) such method of payment is then permitted under Applicable Laws, (B) such Common Stock, if acquired directly from the Company, was owned by the Participant for such minimum period of time, if any, as may be established by the Company at any time, and (C) such Common Stock is not subject to any repurchase, forfeiture, unfulfilled vesting or other similar requirements;

(iii) surrendering shares of Common Stock then issuable upon exercise of the Option valued at their Fair Market Value on the date of exercise;

(iv) delivery of a promissory note of the Participant to the Company on terms determined by the Administrator;

(v) delivery of property of any other kind which constitutes good and valuable consideration as determined by the Administrator; or

(vi) any combination of the above permitted forms of payment (including cash or check).

(g) *Early Exercise of Options*. The Administrator may provide in the terms of an Award Agreement that the Service Provider may exercise an Option in whole or in part prior to the full vesting of the Option in exchange for unvested shares of Restricted Stock with respect to any unvested portion of the Option so exercised. Shares of Restricted Stock acquired upon the exercise of any unvested portion of an Option shall be subject to such terms and conditions as the Administrator shall determine.

6. ***Restricted Stock; Restricted Stock Units***.

(a) *General*. The Administrator may grant Restricted Stock, or the right to purchase Restricted Stock, to any Service Provider, subject to the right of the Company to repurchase all or part of such shares at their issue price or other stated or formula price from the Participant (or to require forfeiture of such shares if issued at no cost) in the event that conditions specified by the Administrator in the applicable Award Agreement are not satisfied prior to the end of the applicable restriction period or periods established by the Administrator for such Award. In addition, the Administrator may grant to Service Providers Restricted Stock Units, which may be subject to vesting and forfeiture conditions during applicable restriction period or periods, as set forth in an applicable Award Agreement.

(b) *Terms and Conditions for All Restricted Stock and Restricted Stock Unit Awards*. The Administrator shall determine and set forth in the applicable Award Agreement the terms and conditions applicable to each Restricted Stock and Restricted Stock Unit Award, including the conditions for vesting and repurchase (or forfeiture) and the issue price, in each case, if any.

(c) *Additional Provisions Relating to Restricted Stock*.

(i) *Dividends*. Participants holding shares of Restricted Stock will be entitled to all ordinary cash dividends paid with respect to such shares, unless otherwise provided by the Administrator in the applicable Award Agreement. In addition, unless otherwise provided by the Administrator, if any dividends or distributions are paid in shares, or consist of a dividend or distribution to holders of Common Stock of property other than an ordinary cash dividend, the shares or other property will be subject to the same restrictions on transferability and forfeitability as the shares of Restricted Stock with respect to which they were paid. Each dividend payment will be made as provided in the applicable Award Agreement, but in no event later than the end of the calendar year in which the dividends are paid to stockholders of that class of stock or, if later, the 15th day of the third month following the later of (A) the date the dividends are paid to stockholders of that class of stock, and (B) the date the dividends are no longer subject to forfeiture.

(ii) *Stock Certificates*. The Company may require that any stock certificates issued in respect of shares of Restricted Stock be deposited in escrow by the Participant, together with a stock power endorsed in blank, with the Company (or its designee).

(d) *Additional Provisions Relating to Restricted Stock Units*.

(i) *Settlement*. Upon the vesting of a Restricted Stock Unit, the Participant shall be entitled to receive from the Company one share of Common Stock or an amount of cash or other property equal to the Fair Market Value of one share of Common Stock on the settlement date, as provided in the applicable Award Agreement. The Administrator may provide that settlement of Restricted Stock Units shall occur upon or as soon as reasonably practicable after the vesting of the Restricted Stock Units or shall instead be deferred, on a mandatory basis or at the election of the Participant, in a manner that complies with Section 409A.

(ii) *Voting Rights*. A Participant shall have no voting rights with respect to any Restricted Stock Units unless and until shares are delivered in settlement thereof.

(iii) *Dividend Equivalents*. To the extent provided by the Administrator, a grant of Restricted Stock Units may provide a Participant with the right to receive Dividend Equivalents. Dividend Equivalents may be paid currently or credited to an account for the Participant, may be settled in cash and/or shares of Common Stock and may be subject to the

same restrictions on transfer and forfeitability as the Restricted Stock Units with respect to which the Dividend Equivalents are paid, as determined by the Administrator, subject, in each case, to such terms and conditions as the Administrator shall establish and set forth in the applicable Award Agreement.

7. ***Other Stock-Based Awards***.

Other Stock-Based Awards may be granted hereunder to Participants, including, without limitation, Awards entitling Participants to receive shares of Common Stock to be delivered in the future. Such Other Stock-Based Awards shall also be available as a form of payment in the settlement of other Awards granted under the Plan, as stand-alone payments and/or as payment in lieu of compensation to which a Participant is otherwise entitled. Other Stock-Based Awards may be paid in shares of Common Stock, cash or other property, as the Administrator shall determine. Subject to the provisions of the Plan, the Administrator shall determine the terms and conditions of each Other Stock-Based Award, including any purchase price, transfer restrictions, vesting conditions and other terms and conditions applicable thereto, which shall be set forth in the applicable Award Agreement.

8. ***Adjustments for Changes in Common Stock and Certain Other Events***.

(a) In the event that the Administrator determines that any dividend or other distribution (whether in the form of cash, Common Stock, other securities, or other property), reorganization, merger, consolidation, combination, repurchase, recapitalization, liquidation, dissolution, or sale, transfer, exchange or other disposition of all or substantially all of the assets of the Company, or exchange of Common Stock or other securities of the Company, issuance of warrants or other rights to purchase Common Stock or other securities of the Company, or other similar corporate transaction or event, as determined by the Administrator, affects the Common Stock such that an adjustment is determined by the Administrator to be appropriate in order to prevent dilution or enlargement of the benefits or potential benefits intended by the Company to be made available under the Plan or with respect to any Award, then the Administrator may, in such manner as it may deem equitable, adjust any or all of:

(i) the number and kind of shares of Common Stock (or other securities or property) with respect to which Awards may be granted or awarded (including, but not limited to, adjustments of the limitations in Section 3 hereof on the maximum number and kind of shares which may be issued);

(ii) the number and kind of shares of Common Stock (or other securities or property) subject to outstanding Awards;

(iii) the grant or exercise price with respect to any Award; and

(iv) the terms and conditions of any Awards (including, without limitation, any applicable financial or other performance “targets” specified in an Award Agreement).

(b) In the event of any transaction or event described in Section 8(a) hereof (including without limitation any Change in Control) or any unusual or nonrecurring transaction or event affecting the Company or the financial statements of the Company, or any change in any Applicable Laws or accounting principles, the Administrator, on such terms and conditions as it deems appropriate, either by the terms of the Award or by action taken prior to the occurrence of such transaction or event and either automatically or upon the Participant's request, is hereby authorized to take any one or more of the following actions whenever the Administrator determines that such action is appropriate in order to (i) prevent dilution or enlargement of the benefits or potential benefits intended by the Company to be made available under the Plan or with respect to any Award granted or issued under the Plan, (ii) to facilitate such transaction or event or (iii) give effect to such changes in Applicable Laws or accounting principles**:**

(i) To provide for the cancellation of any such Award in exchange for either an amount of cash or other property with a value equal to the amount that could have been obtained upon the exercise or settlement of such Award or realization of the Participant's rights had such Award been currently exercisable, payable and fully vested, as applicable; provided that, if the amount that could have been obtained upon the exercise or settlement of such Award or realization of the Participant's rights, in any case, is equal to or less than zero, then such Award may be terminated without payment;

(ii) To provide that such Award shall vest and, to the extent applicable, be exercisable as to all shares covered thereby, notwithstanding anything to the contrary in the Plan or the provisions of such Award;

(iii) To provide that such Award be assumed by the successor or survivor corporation, or a parent or subsidiary thereof, or shall be substituted for by awards covering the stock of the successor or survivor corporation, or a parent or subsidiary thereof, with appropriate adjustments as to the number and kind of shares and applicable exercise or purchase price, in all cases, as determined by the Administrator;

(iv) To make adjustments in the number and type of shares of Common Stock (or other securities or property) subject to outstanding Awards, and/or in the terms and conditions of (including the grant or exercise price), and the criteria included in, outstanding Awards which may be granted in the future;

(v) To replace such Award with other rights or property selected by the Administrator; and/or

(vi) To provide that the Award will terminate and cannot vest, be exercised or become payable after the applicable event.

(c) Notwithstanding the provisions of Section 8(b) above, if a Change in Control occurs and a Participant's Awards are not continued, converted, assumed, or replaced with a substantially similar award by (i) the Company, or (ii) a successor entity or its parent or subsidiary (an "***Assumption***"), and provided that the Participant has not had a Termination of Service, then the Administrator may provide that, immediately prior to the Change in Control, such Awards shall become fully vested, exercisable and/or payable, as applicable, and all forfeiture, repurchase and other restrictions on such Awards shall lapse, in which case, such Awards shall be canceled upon the consummation of the Change in Control in exchange for the right to receive the Change in Control consideration payable to other holders of Common Stock (A) which may be on such terms and conditions as apply generally to holders of Common Stock under the Change in Control documents (including, without limitation, any escrow, earn-out or other deferred consideration provisions) or such other terms and conditions as the Administrator may provide, and (B) determined by reference to the number of shares subject to such Awards and net of any applicable exercise price; provided that to the extent that any Awards constitute "nonqualified deferred compensation" that may not be paid upon the Change in Control under Section 409A without the imposition of taxes thereon under Section 409A, the timing of such payments shall be governed by the applicable Award Agreement (subject to any deferred consideration provisions applicable under the Change in Control documents); and provided, further, that if the amount to which a Participant would be entitled upon the settlement or exercise of such Award at the time of the Change in Control is equal to or less than zero, then such Award may be terminated without payment. The Administrator shall determine whether an Assumption of an Award has occurred in connection with a Change in Control.

(d) In connection with the occurrence of any Equity Restructuring, and notwithstanding anything to the contrary in this Section 8, the Administrator will equitably adjust each outstanding Award, which adjustments may include adjustments to the number and type of securities subject to each outstanding Award and/or the exercise price or grant price thereof, if applicable, the grant of new Awards to Participants, and/or the making of a cash payment to Participants, as the Administrator deems appropriate to reflect such Equity Restructuring. The adjustments provided under this Section 8(e) shall be nondiscretionary and shall be final and binding on the affected Participant and the Company; provided that whether an adjustment is equitable shall be determined by the Administrator.

(e) In the event of any pending stock dividend, stock split, combination or exchange of shares, merger, consolidation or other distribution (other than normal cash dividends) of Company assets to stockholders, or any other change affecting the shares of Common Stock or the share price of the Common Stock, including any Equity Restructuring, or if necessary to comply with Applicable Laws or the Code, or for reasons of administrative convenience, the Administrator may, in its sole discretion, refuse to permit the exercise of any Award during a period of up to thirty days prior to the consummation of any such transaction; provided, however, that in the event the vested portion of an Award is not exercisable on the date the Award would otherwise expire pursuant to the terms set forth in the Award Agreement governing such Award as a result of the Administrator's exercise of discretion pursuant to this Section 8(e), then the expiration of the Award shall be extended through the date that is thirty days following the date on which the Administrator first permits the Award to be exercised (but in no event shall the expiration of the Award be extended beyond the tenth anniversary of the date of grant of such Award.

(f) Except as expressly provided in the Plan or pursuant to action of the Administrator under the Plan, no Participant shall have any rights by reason of any subdivision or consolidation of shares of stock of any class, the payment of any dividend, any increase or decrease in the number of shares of stock of any class or any dissolution, liquidation, merger, or consolidation of the Company or any other corporation. Except as expressly provided in the Plan or pursuant to action of the Administrator under the Plan, no issuance by the Company of shares of stock of any class, or securities convertible into shares of stock of any class, shall affect, and no adjustment by reason thereof shall be made with respect to, the number of shares of Common Stock subject to an Award or the grant or exercise price of any Award. The existence of the Plan, any Award Agreements and the Awards granted hereunder shall not affect or restrict in any way the right or power of the Company to make or authorize (i) any adjustment, recapitalization, reorganization or other change in the Company's capital structure or its business, (ii) any merger, consolidation dissolution or liquidation of the Company or sale of Company assets or (iii) any sale or issuance of securities, including without limitation, securities with rights superior to those of the Common Stock or which are convertible into or exchangeable for Common Stock. The Administrator may treat Participants and Awards (or portions thereof) differently under this Section 8.

9. ***General Provisions Applicable to Awards***.

(a) *Transferability of Awards.* Except as the Administrator may otherwise determine or provide in an Award Agreement or otherwise, in any case in accordance with Applicable Laws, Awards shall not be sold, assigned, transferred, pledged or otherwise encumbered by the person to whom they are granted, either voluntarily or by operation of law, except by will or the laws of descent and distribution, and, during the life of the Participant, shall be exercisable only by the Participant. References to a Participant, to the extent relevant in the context, shall include references to authorized transferees.

(b) *Documentation.* Each Award shall be evidenced in an Award Agreement, which may be in such form (written, electronic or otherwise) as the Administrator shall determine. Each Award may contain terms and conditions in addition to those set forth in the Plan.

(c) *Discretion.* Except as otherwise provided by the Plan, each Award may be made alone or in addition or in relation to any other Award. The terms of each Award to a Participant need not be identical, and the Administrator need not treat Participants or Awards (or portions thereof) uniformly.

(d) *Termination of Status.* The Administrator shall determine the effect on an Award of the disability, death, retirement, authorized leave of absence or any other change or purported change in a Participant's Service Provider status and the extent to which, and the period during which, the Participant, the Participant's legal representative, conservator, guardian or Designated Beneficiary may exercise rights under the Award, if applicable.

(e) *Withholding.* Each Participant shall pay to the Company, or make provision satisfactory to the Administrator for payment of, any taxes required by law to be withheld in connection with Awards to such Participant no later than the date of the event creating the tax liability. Except as the Administrator may otherwise determine, all such payments shall be made in cash or by certified check. Notwithstanding the foregoing, to the extent permitted by the Administrator, Participants may satisfy such tax obligations in whole or in part by delivery of shares of Common Stock, including shares retained from the Award creating the tax obligation, valued at their Fair Market Value. The Company may, to the extent permitted by Applicable Laws, deduct any such tax obligations from any payment of any kind otherwise due to a Participant.

(f) *Amendment of Award.* The Administrator may amend, modify or terminate any outstanding Award, including but not limited to, substituting therefor another Award of the same or a different type, changing the date of exercise or settlement, and converting an Incentive Stock Option to a Non-Qualified Stock Option. The Participant's consent to such action shall be required unless (i) the Administrator determines that the action, taking into account any related action, would not materially and adversely affect the Participant, or (ii) the change is permitted under Section 8 and 10(f) hereof.

(g) *Conditions on Delivery of Stock.* The Company will not be obligated to deliver any shares of Common Stock pursuant to the Plan or to remove restrictions from shares previously delivered under the Plan until (i) all conditions of the Award have been met or removed to the satisfaction of the Company, (ii) in the opinion of the Company's counsel, all other legal matters in connection with the issuance and delivery of such shares have been satisfied, including any applicable securities laws and any applicable stock exchange or stock market rules and regulations, and (iii) the Participant has executed and delivered to the Company such representations or agreements as the Administrator deems necessary or appropriate to satisfy the requirements of any Applicable Laws. The inability of the Company to obtain authority from any regulatory body having jurisdiction, which authority is determined by the Administrator to be necessary to the lawful issuance and sale of any securities hereunder, shall relieve the Company of any liability in respect of the failure to issue or sell such shares as to which such requisite authority shall not have been obtained.

(h) *Acceleration.* The Administrator may at any time provide that any Award shall become immediately vested and/or exercisable in full or in part, free of some or all restrictions or conditions, or otherwise realizable in full or in part, as the case may be.

10. ***Miscellaneous***.

(a) *No Right To Employment or Other Status.* No person shall have any claim or right to be granted an Award, and the grant of an Award shall not be construed as giving a Participant the right to continued employment or any other relationship with the Company. The Company expressly reserves the right at any time to dismiss or otherwise terminate its relationship with a Participant free from any liability or claim under the Plan or any Award, except as expressly provided in an applicable Award Agreement.

(b) *No Rights As Stockholder; Certificates.* Subject to the provisions of the applicable Award Agreement, no Participant or Designated Beneficiary shall have any rights as a stockholder with respect to any shares of Common Stock to be distributed with respect to an Award until becoming the record holder of such shares. Notwithstanding any other provision of the Plan, unless otherwise determined by the Administrator or required by any Applicable Laws, the Company shall not be required to deliver to any Participant certificates evidencing shares of Common Stock issued in connection with any Award and instead such shares of Common Stock may be recorded in the books of the Company (or, as applicable, its transfer agent or stock plan administrator). The Company may place legends on stock certificates issued under the Plan deemed necessary or appropriate by the Administrator in order to comply with Applicable Laws.

(c) *Effective Date and Term of Plan.* The Plan shall become effective on the date on which it is adopted by the Board. No Awards shall be granted under the Plan after the completion of ten years from the earlier of (i) the date on which the Plan was adopted by the Board or (ii) the date the Plan was approved by the Company's stockholders, but Awards previously granted may extend beyond that date in accordance with the terms of the Plan.

(d) *Amendment of Plan.* The Administrator may amend, suspend or terminate the Plan or any portion thereof at any time; provided that no amendment of the Plan shall materially and adversely affect any Award outstanding at the time of such amendment without the consent of the affected Participant. Awards outstanding under the Plan at the time of any suspension or termination of the Plan shall continue to be governed in accordance with the terms of the Plan and the applicable Award Agreement, as in effect prior to such suspension or termination. The Board shall obtain stockholder approval of any Plan amendment to the extent necessary to comply with Applicable Laws.

(e) *Provisions for Foreign Participants*. The Administrator may modify Awards granted to Participants who are foreign nationals or employed outside the United States or establish subplans or procedures under the Plan to address differences in laws, rules, regulations or customs of such foreign jurisdictions with respect to tax, securities, currency, employee benefit or other matters.

(f) *Section 409A.*

(i) *General*. The Company intends that all Awards be structured in compliance with, or to satisfy an exemption from, Section 409A, such that no adverse tax consequences, interest, or penalties under Section 409A apply in connection with any Awards. Notwithstanding anything herein or in any Award Agreement to the contrary, the Administrator may, without a Participant's prior consent, amend this Plan and/or Awards, adopt policies and procedures, or take any other actions (including amendments, policies, procedures and actions with retroactive effect) as are necessary or appropriate to preserve the intended tax treatment of Awards under the Plan, including without limitation, any such actions intended to (A) exempt this Plan and/or any Award from the application of Section 409A, and/or (B) comply with the requirements of Section 409A, including without limitation any such regulations, guidance, compliance programs and other interpretative authority that may be issued after the date of grant

of any Award. The Company makes no representations or warranties as to the tax treatment of any Award under Section 409A or otherwise. The Company shall have no obligation under this Section 10(f) or otherwise to take any action (whether or not described herein) to avoid the imposition of taxes, penalties or interest under Section 409A with respect to any Award and shall have no liability to any Participant or any other person if any Award, compensation or other benefits under the Plan are determined to constitute non-compliant, "nonqualified deferred compensation" subject to the imposition of taxes, penalties and/or interest under Section 409A.

(ii) *Separation from Service*. With respect to any Award that constitutes "nonqualified deferred compensation" under Section 409A, any payment or settlement of such Award that is to be made upon a termination of a Participant's Service Provider relationship shall, to the extent necessary to avoid the imposition of taxes under Section 409A, be made only upon the Participant's "separation from service" (within the meaning of Section 409A), whether such "separation from service" occurs upon or subsequent to the termination of the Participant's Service Provider relationship. For purposes of any such provision of this Plan or any Award Agreement relating to any such payments or benefits, references to a "termination," "termination of employment" or like terms shall mean "separation from service."

(iii) *Payments to Specified Employees*. Notwithstanding any contrary provision in the Plan or any Award Agreement, any payment(s) of "nonqualified deferred compensation" that are otherwise required to be made under an Award to a "specified employee" (as defined under Section 409A and determined by the Administrator) as a result of his or her "separation from service" shall, to the extent necessary to avoid the imposition of taxes under Code Section 409A(a)(2)(B)(i), be delayed until the expiration of the six-month period immediately following such "separation from service" (or, if earlier, until the date of death of the specified employee) and shall instead be paid (in a manner set forth in the Award agreement) on the day that immediately follows the end of such six-month period or as soon as administratively practicable thereafter (without interest). Any payments of "nonqualified deferred compensation" under such Award that are, by their terms, payable more than six months following the Participant's "separation from service" shall be paid at the time or times such payments are otherwise scheduled to be made.

(g) *Limitations on Liability*. Notwithstanding any other provisions of the Plan, no individual acting as a director, officer, other employee or agent of the Company will be liable to any Participant, former Participant, spouse, beneficiary, or any other person for any claim, loss, liability, or expense incurred in connection with the Plan or any Award, nor will such individual be personally liable with respect to the Plan because of any contract or other instrument he or she executes in his or her capacity as an Administrator, director, officer, other employee or agent of the Company. The Company will indemnify and hold harmless each director, officer, other employee and agent of the Company to whom any duty or power relating to the administration or interpretation of the Plan has been or will be granted or delegated, against any cost or expense (including attorneys' fees) or liability (including any sum paid in settlement of a claim with the Administrator's approval) arising out of any act or omission to act concerning this Plan unless arising out of such person's own fraud or bad faith.

(h) *Lock-Up Period*. The Company may, at the request of any representative of the underwriters (the "***Managing Underwriter***") or otherwise, in connection with any registration of the offering of any securities of the Company under the Securities Act, prohibit Participants from, directly or indirectly, selling or otherwise transferring any shares of Common Stock or other securities of the Company during a period of up to one hundred eighty days following the effective date of a registration statement of the Company filed under the Securities Act.

(i) *Right of First Refusal*.

(i) Before any shares of Common Stock held by a Participant or any permitted transferee (each, a "***Holder***") may be sold, pledged, assigned, hypothecated, transferred, or otherwise disposed of (each, a "***Transfer***"), the Company or its assignee(s) shall have a right of first refusal to purchase the shares of Common Stock proposed to be Transferred on the terms and conditions set forth in this Section 10(i) (the "***Right of First Refusal***"). In the event that the Company's charter, bylaws and/or a stockholders' agreement applicable to the shares of Common Stock contain a right of first refusal with respect to the shares of Common Stock, such right of first refusal shall apply to the shares of Common Stock to the extent such provisions are more restrictive than the Right of First Refusal set forth in this Section 10(i) and the Right of First Refusal set forth in this Section 10(i) shall not in any way restrict the operation of the Company's charter, bylaws or the operation of any applicable stockholders' agreement.

(ii) In the event any Holder desires to Transfer any shares of Common Stock, the Holder shall deliver to the Company a written notice (the "***Notice***") stating: (A) the Holder's bona fide intention to sell or otherwise Transfer such shares of Common Stock; (B) the name of each proposed purchaser or other transferee ("***Proposed Transferee***"); (C) the number of shares of Common Stock to be Transferred to each Proposed Transferee; and (D) the price for which the Holder proposes to Transfer the shares of Common Stock (the "***Offered Price***"), and the Holder shall offer such shares of Common Stock at the Offered Price to the Company or its assignee(s).

(iii) Within twenty-five days after receipt of the Notice, the Company and/or its assignee(s) may elect in writing to purchase all, but not less than all, of the shares of Common Stock proposed to be Transferred to any one or more of the Proposed Transferees by delivery of a written exercise notice to the Holder (a "***Company Notice***"). The purchase price ("***Purchase Price***") for the shares of Common Stock repurchased under this Section 10(i) shall be the Offered Price.

(iv) Payment of the Purchase Price shall be made, at the option of the Company or its assignee(s), in cash (by check or wire transfer), by cancellation of all or a portion of any outstanding indebtedness of the Holder to the Company (or, in the case of repurchase by an assignee, to the assignee), or by any combination thereof, within five days after delivery of the Company Notice or in the manner and at the times mutually agreed to by the Company and the Holder. Should the Offered Price specified in the Notice be payable in property other than cash, the Company or its assignee shall have the right to pay the purchase price in the form of cash equal in amount to the value of such property, as determined by the Administrator.

(v) If all or a portion of the shares of Common Stock proposed in the Notice to be Transferred are not purchased by the Company and/or its assignee(s) as provided in this Section 10(i), then the Holder may sell or otherwise Transfer such shares of Common Stock to that Proposed Transferee at the Offered Price or at a higher price; provided that such sale or other Transfer is consummated within sixty days after the date of the Notice; and provided, further, that any such sale or other Transfer is effected in accordance with any Applicable Laws and the Proposed Transferee agrees in writing that the provisions of this Plan and the applicable Award Agreement and any other applicable agreements governing the shares of Common Stock to be Transferred shall continue to apply to the shares of Common Stock in the hands of such Proposed Transferee. If the shares of Common Stock described in the Notice are not Transferred to the Proposed Transferee within such sixty-day period, a new Notice shall be given to the Company, and the Company and/or its assignees shall again be offered the Right of First Refusal, as provided herein, before any shares of Common Stock held by the Holder may be sold or otherwise Transferred.

(vi) Anything to the contrary contained in this Section 10(i) notwithstanding and to the extent permitted by the Administrator, the Transfer of any or all of the shares of Common Stock during a Participant's lifetime or upon a Participant's death by will or intestacy to the Participant's Immediate Family or a trust for the benefit of the Participant's Immediate Family shall be exempt from the Right of First Refusal. As used herein, "***Immediate Family***" shall mean spouse, lineal descendant or antecedent, father, mother, brother or sister or stepchild (whether or not adopted). In such case, the transferee or other recipient shall receive and hold the shares of Common Stock so Transferred subject to the provisions of this Plan (including the Right of First Refusal), the applicable Award Agreement and any other applicable agreements governing the shares of Common Stock to be Transferred, and there shall be no further Transfer of such shares of Common Stock except in accordance with the terms of this Section 10(i) (or otherwise as expressly provided under the Plan).

(vii) The Right of First Refusal shall terminate as to all shares of Common Stock if the Company becomes a Publicly Listed Company upon such occurrence.

(j) *Data Privacy*. As a condition of receipt of any Award, each Participant explicitly and unambiguously consents to the collection, use and transfer, in electronic or other form, of personal data as described in this paragraph by and among, as applicable, the Company and its subsidiaries and affiliates for the exclusive purpose of implementing, administering and managing the Participant's participation in the Plan. The Company and its subsidiaries and affiliates may hold certain personal information about a Participant, including but not limited to, the Participant's name, home address and telephone number, date of birth, social security or insurance number or other identification number, salary, nationality, job title(s), any shares of stock held in the Company or any of its subsidiaries and affiliates, details of all Awards, in each case, for the purpose of implementing, managing and administering the Plan and Awards (the "***Data***"). The Company and its subsidiaries and affiliates may transfer the Data amongst themselves as necessary for the purpose of implementation, administration and management of a Participant's participation in the Plan, and the Company and its subsidiaries and affiliates may each further transfer the Data to any third parties assisting the Company in the implementation, administration and management of the Plan. These recipients may be located in the Participant's country, or elsewhere, and the Participant's country may have different data privacy laws and protections than the recipients' country. Through acceptance of an Award, each Participant authorizes such recipients to receive, possess, use, retain and transfer the Data, in electronic or other form, for the purposes of implementing, administering and managing the Participant's participation in the Plan, including any requisite transfer of such Data as may be required to a broker or other third party with whom the Company or the Participant may elect to deposit any shares of Common Stock. The Data related to a Participant will be held only as long as is necessary to implement, administer, and manage the Participant's participation in the Plan. A Participant may, at any time, view the Data held by the Company with respect to such Participant, request additional information about the storage and processing of the Data with respect to such Participant, recommend any necessary corrections to the Data with respect to the Participant or refuse or withdraw the consents herein in writing, in any case without cost, by contacting his or her local human resources representative. The Company may cancel Participant's ability to participate in the Plan and, in the Administrator's discretion, the Participant may forfeit any outstanding Awards if the Participant refuses or withdraws his or her consents as described herein. For more information on the consequences of refusal to consent or withdrawal of consent, Participants may contact their local human resources representative.

(k) *Severability*. In the event any portion of the Plan or any action taken pursuant thereto shall be held illegal or invalid for any reason, the illegality or invalidity shall not affect the remaining parts of the Plan, and the Plan shall be construed and enforced as if the illegal or invalid provisions had not been included, and the illegal or invalid action shall be null and void.

(l) *Governing Documents*. In the event of any contradiction between the Plan and any Award Agreement or any other written agreement between a Participant and the Company or any Subsidiary of the Company that has been approved by the Administrator, the terms of the Plan shall govern, unless it is expressly specified in such Award Agreement or other written document that a specific provision of the Plan shall not apply.

(m) *Governing Law*. The provisions of the Plan and all Awards made hereunder shall be governed by and interpreted in accordance with the laws of the State of Delaware, disregarding choice-of-law principles of the law of any state that would require the application of the laws of a jurisdiction other than such state.

(n) *Restrictions on Shares; Claw-Back Provisions*. Shares of Common Stock acquired in respect of Awards shall be subject to such terms and conditions as the Administrator shall determine, including, without limitation, restrictions on the transferability of shares of Common Stock, the right of the Company to repurchase shares of Common Stock, the right of the Company to require that shares of Common Stock be transferred in the event of certain transactions, tag-along rights, bring-along rights, redemption and co-sale rights and voting requirements. Such terms and conditions may be additional to those contained in the Plan and may, as determined by the Administrator, be contained in the applicable Award Agreement or in an exercise notice, stockholders' agreement or in such other agreement as the Administrator shall determine, in each case in a form determined by the Administrator. The issuance of such shares of Common Stock shall be conditioned on the Participant's consent to such terms and conditions and the Participant's entering into such agreement or agreements. All Awards (including any proceeds, gains or other economic benefit actually or constructively received by Participant upon any receipt or exercise of any Award or upon the receipt or resale of any shares of Common Stock underlying the Award) shall be subject to the provisions of any claw-back policy implemented by the Company, including, without limitation, any claw-back policy adopted to comply with the requirements of the Dodd-Frank Wall Street Reform and Consumer Protection Act and any rules or regulations promulgated thereunder, to the extent set forth in such claw-back policy and/or in the applicable Award Agreement. Notwithstanding the foregoing, it shall be a condition to the issuance of any shares of Common Stock pursuant to an Award under this Plan that the Participant shall agree in writing to be bound by the terms and conditions of, and become a party to, any stockholders' agreement of the Company.

(o) *Titles and Headings*. The titles and headings of the Sections in the Plan are for convenience of reference only and, in the event of any conflict, the text of the Plan, rather than such titles or headings, shall control.

(p) *Conformity to Securities Laws*. Participant acknowledges that the Plan is intended to conform to the extent necessary with all provisions of the Securities Act and the Exchange Act and any and all regulations and rules promulgated by the Securities and Exchange Commission thereunder, and state securities laws and regulations. Notwithstanding anything herein to the contrary, the Plan and all Awards granted hereunder shall be administered only in such a manner as to conform to such laws, rules and regulations. To the extent permitted by Applicable Laws, the Plan and all Award Agreements shall be deemed amended to the extent necessary to conform to such laws, rules and regulations.

11. ***Definitions***. As used in the Plan, the following words and phrases shall have the following meanings:

(a) "***Administrator***" means the Board or a Committee to the extent that the Board's powers or authority under the Plan have been delegated to such Committee.

(b) "***Applicable Laws***" means the requirements relating to the administration of equity incentive plans under U.S. federal and state securities, tax and other applicable laws, rules and regulations, the applicable rules of any stock exchange or quotation system on which the Common Stock is listed or quoted and the applicable laws and rules of any foreign country or other jurisdiction where Awards are granted or issued under the Plan.

(c) "***Award***" means, individually or collectively, a grant under the Plan of Options, Restricted Stock, Restricted Stock Units or Other Stock-Based Awards.

(d) "***Award Agreement***" means a written agreement evidencing an Award, which agreements may be in electronic medium and shall contain such terms and conditions with respect to an Award as the Administrator shall determine, consistent with and subject to the terms and conditions of the Plan.

(e) "***Board***" means the Board of Directors of the Company.

(f) "***Cause***," with respect to a Participant, means "Cause" (or any term of similar effect) as defined in such Participant's employment agreement with the Company if such an agreement exists and contains a definition of Cause (or term of similar effect), or, if no such agreement exists or such agreement does not contain a definition of Cause (or term of similar effect), then Cause shall include, but not be limited to: (i) the Participant's unauthorized use or disclosure of confidential information or trade secrets of the Company or any material breach of a written agreement between the Participant and the Company, including without limitation a material breach of any employment, confidentiality, non-compete, non-solicit or similar agreement; (ii) the Participant's commission of, indictment for or the entry of a plea of guilty or *nolo contendere* by the Participant to, a felony under the laws of the United States or any state thereof or any crime involving dishonesty or moral turpitude (or any similar crime in any jurisdiction outside the United States); (iii) the Participant's gross negligence or willful misconduct or the Participant's willful or repeated failure or refusal to substantially perform assigned duties; (iv) any act of fraud, embezzlement, material misappropriation or dishonesty committed by the Participant against the Company; or (v) any acts, omissions or statements by a Participant which the Company reasonably determines to be materially detrimental or damaging to the reputation, operations, prospects or business relations of the Company.

(g) "***Change in Control***" means (i) a merger or consolidation of the Company with or into any other corporation or other entity or person, (ii) a sale, lease, exchange or other transfer in one transaction or a series of related transactions of all or substantially all of the Company's assets, or (iii) any other transaction, including the sale by the Company of new shares of its capital stock or a transfer of existing shares of capital stock of the Company, the result of which is that a third party that is not an affiliate of the Company or its stockholders (or a group of third parties not affiliated with the Company or its stockholders) immediately prior to such transaction acquires or holds capital stock of the Company representing a majority of the Company's outstanding voting power immediately following such transaction; provided that the following events shall not constitute a "Change in Control": (A) a transaction (other than a sale of all or substantially all of the Company's assets) in which the holders of the voting securities of the Company immediately prior to the merger or consolidation hold, directly or indirectly, at least a majority of the voting securities in the successor corporation or its parent immediately after the merger or consolidation; (B) a sale, lease, exchange or other transaction in one transaction or a series of related transactions of all or substantially all of the Company's assets to an affiliate of the Company; (C) an initial public offering of any of the Company's securities; (D) a reincorporation of the Company solely to change its jurisdiction; or (E) a transaction undertaken for the primary purpose of creating a holding company that will be owned in substantially the same proportion by the persons who held the Company's securities immediately before such transaction. Notwithstanding the foregoing, if a Change in Control would give rise to a payment or settlement event with respect to any

Award that constitutes "nonqualified deferred compensation," the transaction or event constituting the Change in Control must also constitute a "change in control event" (as defined in Treasury Regulation §1.409A-3(i)(5)) in order to give rise to the payment or settlement event for such Award, to the extent required by Section 409A.

(h) "***Code***" means the Internal Revenue Code of 1986, as amended, and the regulations issued thereunder.

(i) "***Committee***" means one or more committees or subcommittees of the Board, which may be comprised of one or more directors and/or executive officers of the Company, in either case, to the extent permitted in accordance with Applicable Laws.

(j) "***Common Stock***" means the common stock of the Company.

(k) "***Company***" means Oncternal Therapeutics, Inc., a Delaware corporation, or any successor thereto. Except where the context otherwise requires, the term "Company" includes any of the Company's present or future parent or subsidiary corporations as defined in Sections 424(e) or (f) of the Code and any other business venture (including, without limitation, joint venture or limited liability company) in which the Company has a significant interest, as determined by the Administrator.

(l) "***Consultant***" means any person, including any advisor, engaged by the Company or a parent or subsidiary of the Company to render services to such entity.

(m) "***Designated Beneficiary***" means the beneficiary or beneficiaries designated, in a manner determined by the Administrator, by a Participant to receive amounts due or exercise rights of the Participant in the event of the Participant's death or incapacity In the absence of an effective designation by a Participant, "Designated Beneficiary" shall mean the Participant's estate.

(n) "***Director***" means a member of the Board.

(o) "***Disability***" means a permanent and total disability within the meaning of Section 22(e)(3) of the Code, as it may be amended from time to time.

(p) "***Dividend Equivalents***" means a right granted to a Participant pursuant to Section 6(d)(3) hereof to receive the equivalent value (in cash or shares of Common Stock) of dividends paid on shares of Common Stock.

(q) "***Employee***" means any person, including officers and Directors, employed by the Company (within the meaning of Section 3401(c) of the Code) or any parent or subsidiary of the Company.

(r) "***Equity Restructuring***" means, as determined by the Administrator, a non-reciprocal transaction between the Company and its stockholders, such as a stock dividend, stock split, spin-off or recapitalization through a large, nonrecurring cash dividend, that affects the shares of Common Stock (or other securities of the Company) or the share price of Common Stock (or other securities of the Company) and causes a change in the per share value of the Common Stock underlying outstanding Awards.

(s) "***Exchange Act***" means the Securities Exchange Act of 1934, as amended.

(t) "***Fair Market Value***" means, as of any date, the value of Stock determined as follows: (i) if the Common Stock is listed on any established stock exchange, its Fair Market Value shall be the closing sales price for such Common Stock as quoted on such exchange for such date, or if no sale occurred on such date, the first market trading day immediately prior to such date during which a sale occurred, as reported in *The Wall Street Journal* or such other source as the Administrator deems reliable; (ii) if the Common Stock is not traded on a stock exchange but is quoted on a national market or other quotation system, the last sales price on such date, or if no sales occurred on such date, then on the date immediately prior to such date on which sales prices are reported, as reported in *The Wall Street Journal* or such other source as the Administrator deems reliable; or (iii) in the absence of an established market for the Common Stock, the Fair Market Value thereof shall be determined by the Administrator.

(u) "***Good Reason***" shall mean (a) a change in the Participant's position with the Company (or its subsidiary employing the Participant) that materially reduces the Participant's authority, duties or responsibilities, (b) a material diminution in the Participant's level of base compensation, except in connection with a general reduction in the base compensation of the Company's personnel with similar status and responsibilities or (c) a relocation of the Participant's place of employment by more than 50 miles, provided that such change, reduction or relocation is effected by the Company (or its subsidiary employing the Participant) without the Participant's consent. Notwithstanding the foregoing, Good Reason shall only exist if Participant shall have provided the Company with written notice within sixty (60) days of the initial occurrence of any of the foregoing events or conditions, and the Company or any successor or affiliate fails to eliminate the conditions constituting Good Reason within thirty (30) days after receipt of written notice of such event or condition from Participant. Participant's resignation from employment with the Company for "Good Reason" must occur within six (6) months following the initial occurrence of one of the foregoing events or conditions. Notwithstanding the foregoing, if Participant is a party to a written employment or consulting agreement with the Company (or its subsidiary) in which the term "good reason" is defined, then "Good Reason" shall be as such term is defined in the applicable written employment or consulting agreement.

(v) "***Incentive Stock Option***" means an "incentive stock option" as defined in Section 422 of the Code.

(w) "***Non-Qualified Stock Option***" means an Option that is not intended to be or otherwise does not qualify as an Incentive Stock Option.

(x) "***Option***" means an option to purchase Common Stock.

(y) "***Other Stock-Based Awards***" means other Awards of shares of Common Stock, and other Awards that are valued in whole or in part by reference to, or are otherwise based on, shares of Common Stock or other property.

(z) "***Participant***" means a Service Provider who has been granted an Award under the Plan.

(aa) "***Plan***" means this 2015 Equity Incentive Plan.

(bb) "***Publicly Listed Company***" means that the Company or its successor (i) is required to file periodic reports pursuant to Section 12 of the Exchange Act and (ii) the Common Stock is listed on one or more National Securities Exchanges (within the meaning of the Exchange Act) or is quoted on NASDAQ or a successor quotation system.

(cc) "***Restricted Stock***" means Common Stock awarded to a Participant pursuant to Section 6 hereof that is subject to certain vesting conditions and other restrictions.

(dd) "***Restricted Stock Unit***" means an unfunded, unsecured right to receive, on the applicable settlement date, one share of Common Stock or an amount in cash or other consideration determined by the Administrator equal to the value thereof as of such payment date, which right may be subject to certain vesting conditions and other restrictions.

(ee) "***Section 409A***" means Section 409A of the Code and all regulations, guidance, compliance programs and other interpretative authority thereunder.

(ff) "***Securities Act***" means the Securities Act of 1933, as amended from time to time.

(gg) "***Service Provider***" means an Employee, Consultant or Director.

(hh) "***Termination of Service***" means the date the Participant ceases to be a Service Provider.

ONCTERNAL THERAPEUTICS, INC.

2015 EQUITY INCENTIVE PLAN

CALIFORNIA SUPPLEMENT

The Administrator has adopted this supplement for purposes of satisfying the requirements of Section 25102(o) of the California Corporations Code and the regulations issued thereunder ("***Section 25102(o)***"). Notwithstanding anything to the contrary contained in the Plan and except as otherwise determined by the Administrator, the provisions set forth in this supplement shall apply to all Awards granted under the Plan to a Participant who is a resident of the State of California on the date of grant (a "***California Participant***") and which are intended to be exempt from registration in California pursuant to Section 25102(o). This supplement shall not apply to Awards granted to California Participants or after the date on which the Company becomes a Publicly Listed Company. Definitions in the Plan are applicable to this supplement.

1. ***Additional Limitations On Options***.

(a) *Maximum Duration of Options.* No Options granted to California Participants will be granted for a term in excess of 10 years.

(b) *Minimum Exercise Period Following Termination.* Unless a California Participant's Service Provider relationship is terminated for Cause, in the event of termination of such Participant's Service Provider relationship, to the extent required by Applicable Laws, he or she shall have the right to exercise an Option, to the extent that he or she was otherwise entitled to exercise such Option on the date employment terminated, as follows: (i) at least six months from the date of termination, if termination was caused by such Participant's death or Disability and (ii) at least 30 days from the date of termination, if termination was caused other than by such Participant's death or Disability.

2. ***Additional Limitations For Restricted Stock Awards, Restricted Stock Units and Other Stock-Based Awards***. The terms of all Restricted Stock Awards, Restricted Stock Units and Other Stock-Based Awards granted to California Participants shall comply, to the extent applicable, with Section 260.140.41 or Section 260.140.42 of the California Code of Regulations.

3. ***Adjustments***. The Administrator will make such adjustments to an Award held by a California Participant as may be required by Section 260.140.41 or Section 260.140.42 of the California Code of Regulations.

4. ***Additional Requirement To Provide Information To California Participants***. To the extent required by Section 260.140.46 of the California Code of Regulations, the Company shall provide to each California Participant and to each California Participant who acquires Common Stock pursuant to the Plan, not less frequently than annually, copies of annual financial statements (which need not be audited). The Company shall not be required to provide such statements to key persons whose duties in connection with the Company assure their access to equivalent information. In addition, this information requirement shall not apply to the Plan to the extent that it complies with all conditions of Rule 701 of the Securities Act ("***Rule 701***") as determined by the Administrator; provided that for purposes of determining such compliance, any registered domestic partner shall be considered a "family member" as that term is defined in Rule 701.

5. ***Stockholder Approval; Additional Limitations On Timing Of Awards***. The Plan will be submitted for the approval of the Company's stockholders within twelve (12) months after the date of the Board's adoption of the Plan. Awards may be granted or awarded prior to such stockholder approval; provided that no Award granted to a California Participant shall become exercisable, vested or realizable, as applicable to such Award, unless the Plan has been approved by the Company's stockholders within twelve months before or after the date the Plan was adopted by the Administrator; and provided, further, that if such approval has not been obtained at the end of said twelve-month period, all Awards previously granted or awarded under the Plan to California Participants shall thereupon be canceled and become null and void.

AMENDMENT NO. 1
TO THE
TOKALAS, INC. 2015 EQUITY INCENTIVE PLAN

THIS AMENDMENT NO. 1 TO THE TOKALAS, INC. 2015 EQUITY INCENTIVE PLAN (this "***Amendment***"), is made and adopted by TOKALAS, INC., a Delaware corporation (the "***Company***"), effective as of immediately following the closing of the transactions contemplated by that certain Agreement and Plan of Merger, by and among Tokalas, Inc., Oncternal Merger Sub, Inc. and Oncternal Therapeutics, Inc. (the "***Effective Time***"). Capitalized terms used but not otherwise defined herein shall have the meanings ascribed to them in the Plan (as defined below).

RECITALS

WHEREAS, the Company has adopted the Tokalas, Inc. 2015 Equity Incentive Plan (the "***Plan***");

WHEREAS, the Company desires to amend the Plan as set forth below;

WHEREAS, pursuant to Section 10(d) of the Plan, the Plan may be amended by the Board of Directors of the Company; and

WHEREAS, the Board of Directors of the Company has approved this Amendment pursuant to resolutions adopted on May 11, 2016, and the stockholders of the Company have approved this Amendment pursuant to resolutions adopted on May 26, 2016, to be effective as of the Effective Time.

NOW, THEREFORE, in consideration of the foregoing, the Company hereby amends the Plan as follows:

1. The title of the Plan shall be changed to "ONCTERNAL THERAPEUTICS, INC. 2015 EQUITY INCENTIVE PLAN" and all references to "the Company" within the Plan shall refer to Oncternal Therapeutics, Inc.

2. The title of the California supplement attached to the Plan shall be changed to "ONCTERNAL THERAPEUTICS, INC. 2015 EQUITY INCENTIVE PLAN CALIFORNIA SUPPLEMENT" and all references to "the Company" within the California supplement shall refer to Oncternal Therapeutics, Inc.

3. The first sentence of Section 4(a) of the Plan is hereby amended to read as follows:

"(a) *Number of Shares.* Subject to adjustment under Section 8 hereof, Awards may be made under the Plan covering up to 3,000,000 shares of Common Stock."

2. This Amendment shall be and is hereby incorporated in and forms a part of the Plan. All other terms and provisions of the Plan shall remain unchanged except as specifically modified herein. The Plan, as amended by this Amendment, is hereby ratified and confirmed.

I hereby certify that the foregoing Amendment was duly adopted by the Board of Directors of Tokalas, Inc. on May 11, 2016, and duly approved by the stockholders of Tokalas, Inc. on May 26, 2016, to be effective as of the Effective Time.

By: /s/ Scott L. Glenn
Name: Scott L. Glenn
Title: Secretary

AMENDMENT NO. 2
TO THE
ONCTERNAL THERAPEUTICS, INC. 2015 EQUITY INCENTIVE PLAN

THIS AMENDMENT NO. 2 TO THE ONCTERNAL THERAPEUTICS, INC. 2015 EQUITY INCENTIVE PLAN (this "***Amendment***"), dated as of September 21, 2018, is made and adopted by ONCTERNAL THERAPEUTICS, INC., a Delaware corporation (the "***Company***"). Capitalized terms used but not otherwise defined herein shall have the meanings ascribed to them in the Plan (as defined below).

RECITALS

WHEREAS, the Company has adopted the Oncternal Therapeutics, Inc. 2015 Equity Incentive Plan (as amended, the "***Plan***");

WHEREAS, the Company desires to amend the Plan as set forth below;

WHEREAS, pursuant to Section 10(d) of the Plan, the Plan may be amended by the Board of Directors of the Company; and

WHEREAS, the Board of Directors of the Company has approved this Amendment pursuant to resolutions adopted on September 21, 2018, and the stockholders of the Company have approved this Amendment pursuant to resolutions adopted on September 21, 2018.

NOW, THEREFORE, in consideration of the foregoing, the Company hereby amends the Plan as follows:

1. The first sentence of Section 4(a) of the Plan is hereby amended to read as follows:

"(a) *Number of Shares.* Subject to adjustment under Section 8 hereof, Awards may be made under the Plan covering up to 8,600,000 shares of Common Stock."

2. This Amendment shall be and is hereby incorporated in and forms a part of the Plan. All other terms and provisions of the Plan shall remain unchanged except as specifically modified herein. The Plan, as amended by this Amendment, is hereby ratified and confirmed.

[Remainder of Page Intentionally Left Blank]

I hereby certify that the foregoing Amendment was duly adopted by the Board of Directors of the Company on September 21, 2018, and duly approved by the stockholders of the Company on September 21, 2018.

By: /s/ Richard G. Vincent
Name: Richard G. Vincent
Title: Secretary

ONCTERNAL THERAPEUTICS, INC.

2015 EQUITY INCENTIVE PLAN

STOCK OPTION GRANT NOTICE AND
STOCK OPTION AGREEMENT

Oncternal Therapeutics, Inc. (the "***Company***"), pursuant to its 2015 Equity Incentive Plan (the "***Plan***"), hereby grants to Participant an Option to purchase the number of shares of the Company's Common Stock (referred to herein as "***Shares***") set forth below. This Option is subject to all of the terms and conditions as set forth herein and in the Stock Option Agreement attached hereto as Exhibit A (the "***Agreement***") and the Plan, each of which is incorporated herein by reference. Unless otherwise defined herein, the terms defined in the Plan shall have the same defined meanings in this Stock Option Grant Notice ("***Grant Notice***") and the Agreement.

Participant:	*[Insert Participant Name]*
Grant Date:	*[Insert Grant Date]*
Vesting Commencement Date:	*[Insert Vesting Commencement Date]*
Exercise Price per Share:	*$[Insert Exercise Price Per Share]*
Total Exercise Price:	*$[Insert Aggregate Fair Market Value on Grant Date]*
Total Number of Shares Subject to Option:	*[Insert Number of Shares]*
Expiration Date:	*[Insert tenth anniversary of Grant Date]*
Type of Option:	☐ Incentive Stock Option ☐ Non-Qualified Stock Option
Vesting Schedule:	[25% of the total number of shares of Stock subject to the Option (rounded down to the next whole number of shares) shall vest one year after the Vesting Commencement Date, and 1/48th of the total number of shares of Stock subject to the Option (rounded down to the next whole number of shares) shall vest on the last day of each one-month period of Participant's service as an Employee, Director or Consultant thereafter, so that all of the shares of Stock subject to the Option shall be vested on the fourth (4th) anniversary of the Vesting Commencement Date.]

By his or her signature and the Company's signature below, Participant agrees to be bound by the terms and conditions of the Plan, the Agreement and this Grant Notice. Participant has reviewed the Agreement, the Plan and this Grant Notice in their entirety, has had an opportunity to obtain the advice of counsel prior to executing this Grant Notice and fully understands all provisions of this Grant Notice, the Agreement and the Plan. Participant hereby agrees to accept as binding, conclusive and final all decisions or interpretations of the Administrator of the Plan upon any questions arising under the Plan or the Agreement.

ONCTERNAL THERAPEUTICS, INC.

By: _____

Print Name: _____

Title: _____

PARTICIPANT

By: _____

Print Name: _____

State of Residence: _____

EXHIBIT A

TO STOCK OPTION GRANT NOTICE

STOCK OPTION AGREEMENT

Pursuant to the Grant Notice to which this Agreement is attached, the Company has granted to Participant an Option under the Plan to purchase the number of Shares indicated in the Grant Notice.

1. ***Grant of Option***. In consideration of Participant's past and/or continued employment with or service to the Company and for other good and valuable consideration, effective as of the Grant Date set forth in the Grant Notice, the Company irrevocably grants to Participant an Option to purchase any part or all of an aggregate of the number of Shares set forth in the Grant Notice at the Exercise Price per Share set forth in the Grant Notice, upon the terms and conditions set forth in the Plan and this Agreement.

2. ***Vesting***. The Option shall become vested in such amounts and at such times as are set forth in the vesting schedule in the Grant Notice. The installments provided for in the vesting schedule are cumulative. No portion of the Option which has not become vested at the date Participant incurs a Termination of Service shall thereafter become vested, except as may be otherwise provided by the Administrator or as set forth in another written agreement between the Company and Participant.

3. ***Exercise***.

(a) *Duration of Exercisability.* Any vested portion of the Option may be exercised in whole or in part at any time prior to the time when the Option or portion thereof becomes unexercisable under Section 4.

(b) *Person Eligible to Exercise*. During the lifetime of Participant, only Participant may exercise the Option or any portion thereof. After the death of Participant, any exercisable portion of the Option may, prior to the time when the Option becomes unexercisable under Section 4, be exercised by Participant's personal representative or by any person empowered to do so under the deceased Participant's will or under the then Applicable Laws of descent and distribution.

(c) *Manner of Exercise*. The Option, or any portion thereof, may be exercised solely by delivery to the Secretary of the Company or the Secretary's office, or such other place as may be determined by the Administrator, of all of the following prior to the time when the Option or such portion thereof becomes unexercisable under Section 4:

(i) A written exercise notice in substantially in the form attached as Exhibit B to the Grant Notice (or such other form as is prescribed by the Administrator, which may be an electronic form) (the "***Exercise Notice***") signed by Participant or any other person then entitled to exercise the Option or portion thereof, stating that the Option or portion thereof is thereby exercised, such Exercise Notice complying with all applicable rules established by the Administrator; and

(ii) Subject to Section 5(f) of the Plan, full payment for the Shares with respect to which the Option or portion thereof is exercised by:

(A) Cash or check, payable to the order of the Company; or

(B) With the consent of the Administrator, surrendering shares of Common Stock then issuable upon exercise of the Option valued at their Fair Market Value on the date of exercise; or

(C) On and after the date the Company becomes a Publicly Listed Company, through the (A) delivery by Participant to the Company of an irrevocable and unconditional undertaking by a creditworthy broker to deliver promptly to the Company sufficient funds to pay the exercise price or (B) delivery by Participant to the Company of a copy of irrevocable and unconditional instructions to a creditworthy broker to deliver promptly to the Company cash or a check sufficient to pay the exercise price; or

(D) With the consent of the Administrator, any other form of payment permitted under Section 5(f) of the Plan; or

(E) any combination of the above permitted forms of payment; and

(iii) Subject to Section 9(e) of the Plan, full payment for any applicable withholding taxes in cash or by check or in the form of consideration permitted by the Administrator for the payment of the exercise price pursuant to Section 3(c)(ii) above or pursuant to Section 3(d) below, which, following the date the Company becomes a Publicly Listed Company shall include the method provided for in Section 3(c)(ii)(C) above; and

(iv) In the event the Option or portion thereof shall be exercised pursuant to Section 3.1 by any person or persons other than Participant, appropriate proof of the right of such person or persons to exercise the Option.

(d) *Tax Withholding*. The Company shall have the authority and the right to deduct or withhold, or require Participant to remit to the Company, an amount sufficient to satisfy federal, state, local and foreign taxes (including Participant's employment tax obligation) required by law to be withheld with respect to any taxable event concerning Participant arising as a result of the Option or otherwise under this Agreement, including, without limitation, the authority to deduct such amounts from other compensation payable to Participant by the Company.

(e) *Fractional Shares*. The Option may only be exercised for whole shares of Common Stock. Any fractional Shares shall be rounded down to the nearest whole share.

4. ***Expiration of Option***. The Option may not be exercised to any extent by anyone after the first to occur of the following events:

(a) The Expiration Date set forth in the Grant Notice;

(b) The expiration of three months following the date of Participant's Termination of Service, unless such Termination of Service occurs by reason of Participant's death or Disability or Participant's discharge by the Company for Cause;

(c) The expiration of one year following the date of Participant's Termination of Service by reason of Participant's death or Disability;

(d) The date of Participant's Termination of Service as a result of Participant's discharge by the Company for Cause; or

(e) With respect to any unvested portion of the Option, the date that is thirty days following Participant's Termination of Service for any reason other than as a result of Participant's discharge by the Company for Cause, or such shorter period as may be determined by the Administrator.

Participant acknowledges that an Incentive Stock Option exercised more than three months after Participant's termination of status as an Employee, other than by reason of death or Disability, will be taxed as a Non-Qualified Stock Option.

5. ***Transferability***. The Option shall not be sold, assigned, transferred, pledged or otherwise encumbered by Participant, either voluntarily or by operation of law, except by will or the laws of descent and distribution, and, during the life of the Participant, the Option shall be exercisable only by the Participant.

6. ***Restrictive Legends and Stop-Transfer Orders***.

(a) *Legends*. Participant understands and agrees that the Company shall cause any certificates issued evidencing the Shares to have the legends set forth below or legends substantially equivalent thereto, together with any other legends that may be required by Applicable Laws:

> THE SHARES REPRESENTED HEREBY HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED ("ACT"), NOR HAVE THEY BEEN REGISTERED OR QUALIFIED UNDER THE SECURITIES LAWS OF ANY STATE. NO TRANSFER OF SUCH SECURITIES WILL BE PERMITTED UNLESS A REGISTRATION STATEMENT UNDER THE ACT IS IN EFFECT AS TO SUCH TRANSFER, THE TRANSFER IS MADE IN ACCORDANCE WITH RULE 144 UNDER THE ACT, OR IN THE OPINION OF COUNSEL (WHICH MAY BE COUNSEL FOR THE COMPANY) REGISTRATION UNDER THE ACT IS UNNECESSARY IN ORDER FOR SUCH TRANSFER TO COMPLY WITH THE ACT AND WITH APPLICABLE STATE SECURITIES LAWS.
>
> THE SHARES REPRESENTED BY THIS CERTIFICATE MAY BE TRANSFERRED ONLY IN ACCORDANCE WITH THE TERMS OF AN AGREEMENT BETWEEN THE COMPANY AND THE STOCKHOLDER, A COPY OF WHICH IS ON FILE WITH THE SECRETARY OF THE COMPANY. SUCH TRANSFER RESTRICTIONS ARE BINDING ON TRANSFEREES OF THESE SHARES.

(b) *Stop Transfer Orders*. Participant agrees that, in order to ensure compliance with the restrictions referred to in the Plan and this Agreement, the Company may issue appropriate "stop transfer" instructions to its transfer agent, if any, and that, if the Company transfers its own securities, it may make appropriate notations to the same effect in its own records.

(c) *Impermissible Transfers Void*. The Company shall not be required (i) to transfer on its books any Shares that have been sold or otherwise transferred in violation of any of the provisions of this Agreement or (ii) to treat as owner of such Shares or to accord the right to vote or pay dividends to any purchaser or other transferee to whom such Shares shall have been so transferred.

7. ***Taxes***. Participant understands that Participant may suffer adverse tax consequences as a result of Participant's purchase or disposition of the Shares. Participant represents that Participant has consulted with any tax consultants Participant deems advisable in connection with the purchase or disposition of the Shares and that Participant is not relying on the Company for any tax advice. Participant is relying solely on such advisors and not on any statements or representations of the Company or any of its agents. Participant understands that Participant (and not the Company) shall be responsible for Participant's tax liability that may arise as a result of the transactions contemplated by this Agreement.

8. ***Miscellaneous***.

(a) *No Right To Employment or Other Status*. No person shall have any claim or right to be granted an Award, and the grant of an Award shall not be construed as giving a Participant the right to continued employment or any other relationship with the Company. The Company expressly reserves the right at any time to dismiss or otherwise terminate its relationship with a Participant free from any liability or claim under the Plan or this Agreement.

(b) *Notices*. Any notice to be given under the terms of this Agreement to the Company shall be addressed to the Company in care of the Secretary of the Company at the Company's principal office or to the then-current email address for the Secretary of the Company, and any notice to be given to Participant shall be addressed to Participant at the most-recent physical or email address for Participant listed in the Company's personnel records. By a notice given pursuant to this Section 8(b), either party may hereafter designate a different address for notices to be given to that party. Any notice which is required to be given to Participant shall, if Participant is then deceased, be given to the person entitled to exercise his or her Option by written notice under this Section 8(b). Any notice shall be deemed duly given when sent via email or when sent by certified mail (return receipt requested) and deposited (with postage prepaid) in a post office or branch post office regularly maintained by the United States Postal Service.

(c) *Successors and Assigns*. The Company may assign any of its rights under this Agreement and the Exercise Notice to single or multiple assignees, and this Agreement shall inure to the benefit of the successors and assigns of the Company. Subject to the restrictions on transfer herein set forth, this Agreement shall be binding upon Participant and his or her heirs, executors, administrators, successors and assigns.

(d) *Severability*. In the event any portion of the Plan or this Agreement or any action taken pursuant thereto shall be held illegal or invalid for any reason, the illegality or invalidity shall not affect the remaining parts of the Plan and this Agreement, and the Plan and this Agreement shall be construed and enforced as if the illegal or invalid provisions had not been included, and the illegal or invalid action shall be null and void.

(e) *Entire Agreement; Governing Documents*. The Plan, the Grant Notice and this Agreement (including all Exhibits thereto) constitute the entire agreement of the parties and supersede in their entirety all prior undertakings and agreements of the Company and Participant with respect to the subject matter hereof. In the event of any contradiction between the Plan and any Award Agreement or any other written agreement between a Participant and the Company that has been approved by the Administrator, the terms of the Plan shall govern, unless it is expressly specified in such Award Agreement or other written document that a specific provision of the Plan shall not apply.

(f) *Governing Law*. The provisions of the Plan and all Awards made thereunder, including the Option, shall be governed by and interpreted in accordance with the laws of the State of Delaware, disregarding choice-of-law principles of the law of any state that would require the application of the laws of a jurisdiction other than such state.

(g) *Titles and Headings*. The titles and headings of the Sections in this Agreement are for convenience of reference only and, in the event of any conflict, the text of this Agreement, rather than such titles or headings, shall control.

EXHIBIT B

TO STOCK OPTION GRANT NOTICE

FORM OF EXERCISE NOTICE

Effective as of today, _____, _____, the undersigned *("**Participant**") hereby elects to exercise Participant's option to purchase _____ Shares of Oncternal Therapeutics, Inc. (the "***Company***") under and pursuant to the Oncternal Therapeutics, Inc. 2015 Equity Incentive Plan (the "***Plan***") and the Stock Option Grant Notice and Stock Option Agreement dated _____, ____ (the "***Agreement***"). Capitalized terms used herein without definition shall have the meanings given in the Agreement.

Grant Date: _____

Number of Shares as to which Option is Exercised: _____

Exercise Price per Share: $_____

Total Exercise Price: $_____

Certificate to be issued in name of: _____

Cash Payment delivered herewith: $_____ (Representing the full Exercise Price for the Shares, as well as any applicable withholding tax)

Type of Option: ☐ Incentive Stock Option ☐ Non-Qualified Stock Option

1. ***Representations of Participant***. Participant acknowledges that Participant has received, read and understood the Plan and the Agreement. Participant agrees to abide by and be bound by their terms and conditions. Participant further acknowledges that it is a condition to the issuance of the Shares to Participant upon exercise of the Option listed above that Participant agree to be bound by the terms and conditions of, and become a party to, any stockholders' agreement of the Company. Participant hereby agrees to be so bound and to execute any additional documents as may be deemed necessary or advisable by the Company in order to effectuate the foregoing agreement.

2. ***Tax Consultation***. Participant understands that Participant may suffer adverse tax consequences as a result of Participant's purchase or disposition of the Shares. Participant represents that Participant has consulted with any tax consultants Participant deems advisable in connection with the purchase or disposition of the Shares and that Participant is not relying on the Company for any tax advice. Participant is relying solely on such advisors and not on any statements or representations of the Company or any of its agents. Participant understands that Participant (and not the Company) shall be responsible for Participant's tax liability that may arise as a result of this investment or the transactions contemplated by this Agreement.

3. ***Participant Representations***. Participant hereby makes the following certifications and representations with respect to the Shares listed above:

(a) Participant is aware of the Company's business affairs and financial condition and has acquired sufficient information about the Company to reach an informed and knowledgeable decision to acquire the Shares. Participant is acquiring these Shares for investment for Participant's own account only and not with a view to, or for resale in connection with, any "distribution" thereof within the meaning of the Securities Act.

(b) Participant acknowledges and understands that the Shares constitute "restricted securities" under the Securities Act and have not been registered under the Securities Act in reliance upon a specific exemption therefrom, which exemption depends upon, among other things, the bona fide nature of Participant's investment intent as expressed herein. Participant understands that the Shares must be held indefinitely unless they are subsequently registered under the Securities Act or an exemption from such registration is available. Participant further acknowledges and understands that the Company is under no obligation to register the Shares. Participant understands that the certificate evidencing the Shares will be imprinted with a legend which prohibits the transfer of the Shares unless they are registered or such registration is not required in the opinion of counsel satisfactory to the Company and any other legend required under Applicable Laws.

(c) Participant is familiar with the provisions of Rule 701 and Rule 144, each promulgated under the Securities Act, which, in substance, permit limited public resale of "restricted securities" acquired, directly or indirectly from the issuer thereof, in a non-public offering subject to the satisfaction of certain conditions. Rule 701 provides that if the issuer qualifies under Rule 701 at the time of the grant of the Option to Participant, the exercise will be exempt from registration under the Securities Act. In the event the Company becomes subject to the reporting requirements of Section 13 or 15(d) of the Exchange Act, ninety days thereafter (or such longer period as any market stand-off agreement may require) the securities exempt under Rule 701 may be resold, subject to the satisfaction of certain of the conditions specified by Rule 144.

(d) In the event that the Company does not qualify under Rule 701 at the time of grant of the Option, then the securities may be resold in certain limited circumstances subject to the provisions of Rule 144.

(e) Participant further understands that in the event all of the applicable requirements of Rule 701 or 144 are not satisfied, registration under the Securities Act, compliance with Regulation A, or some other registration exemption will be required; and that, notwithstanding the fact that Rules 144 and 701 are not exclusive, the Staff of the Securities and Exchange Commission has expressed its opinion that persons proposing to sell private placement securities other than in a registered offering and otherwise than pursuant to Rules 144 or 701 will have a substantial burden of proof in establishing that an exemption from registration is available for such offers or sales, and that such persons and their respective brokers who participate in such transactions do so at their own risk. Participant understands that no assurances can be given that any such other registration exemption will be available in such event.

4. ***Notices***. Any notice required or permitted hereunder shall be given in accordance with the provisions set forth in Section 8(b) of the Agreement.

5. ***Entire Agreement***. The Plan and Agreement are incorporated herein by reference. This Notice, the Plan and the Agreement constitute the entire agreement of the parties and supersede in their entirety all prior undertakings and agreements of the Company and Participant with respect to the subject matter hereof.

ACCEPTED BY:	**SUBMITTED BY**
ONCTERNAL THERAPEUTICS, INC.	**PARTICIPANT:**
By: _____	By: _____
Print Name: _____	Print Name: _____
Title: _____	

Exhibit 10.59

ONCTERNAL THERAPEUTICS, INC.

2015 EQUITY INCENTIVE PLAN

STOCK OPTION GRANT NOTICE AND
STOCK OPTION AGREEMENT

Oncternal Therapeutics, Inc. (the "***Company***"), pursuant to its 2015 Equity Incentive Plan (the "***Plan***"), hereby grants to Participant an Option to purchase the number of shares of the Company's Common Stock (referred to herein as "***Shares***") set forth below. This Option is subject to all of the terms and conditions as set forth herein and in the Stock Option Agreement attached hereto as Exhibit A (the "***Agreement***") and the Plan, each of which is incorporated herein by reference. Unless otherwise defined herein, the terms defined in the Plan shall have the same defined meanings in this Stock Option Grant Notice ("***Grant Notice***") and the Agreement.

Participant:	[Insert Participant Name]
Grant Date:	[Insert Grant Date]
Vesting Commencement Date:	[Insert Vesting Commencement Date]
Exercise Price per Share:	$[Insert Exercise Price Per Share]
Total Exercise Price:	$[Insert Aggregate Fair Market Value on Grant Date]
Total Number of Shares Subject to Option:	[Insert Number of Shares]
Expiration Date:	[Insert tenth anniversary of Grant Date]
Type of Option:	☐ Incentive Stock Option ☐ Non-Qualified Stock Option
Exercise Schedule:	☒ Early Exercise Permitted
Vesting Schedule:	This Option is exercisable immediately, in whole or in part, at such times as are established by the Administrator, conditioned upon Participant entering into a Restricted Stock Purchase Agreement with respect to any unvested shares of Stock. The shares subject to this Option shall vest and/or be released from the Company's Repurchase Option, as set forth in the Restricted Stock Purchase Agreement attached hereto as Exhibit C (the "***Restricted Stock Purchase Agreement***"), according to the following schedule: [25% of the total number of shares of Stock subject to the Option (rounded down to the next whole number of shares) shall vest and/or be released from the Company's Repurchase Option one year after the Vesting Commencement Date, and 1/48th of the total number of shares of Stock subject to the Option (rounded down to the next whole number of shares) shall vest and/or be released from the Company's Repurchase Option on the last day of each one-month period of Participant's service as an Employee, Director or Consultant thereafter, so that all of the shares of Stock subject to the Option shall be vested on the fourth (4th) anniversary of the Vesting Commencement Date.]

By his or her signature and the Company's signature below, Participant agrees to be bound by the terms and conditions of the Plan, the Agreement and this Grant Notice. Participant has reviewed the Agreement, the Plan and this Grant Notice in their entirety, has had an opportunity to obtain the advice of counsel prior to executing this Grant Notice and fully understands all provisions of this Grant Notice, the Agreement and the Plan. Participant hereby agrees to accept as binding, conclusive and final all decisions or interpretations of the Administrator of the Plan upon any questions arising under the Plan or the Agreement.

ONCTERNAL THERAPEUTICS, INC.

By: _____

Print Name: _____

Title: _____

PARTICIPANT:

By: _____

Print Name: _____

State of Residence: _____

EXHIBIT A

TO STOCK OPTION GRANT NOTICE

STOCK OPTION AGREEMENT

Pursuant to the Grant Notice to which this Agreement is attached, the Company has granted to Participant an Option under the Plan to purchase the number of Shares indicated in the Grant Notice.

1. ***Grant of Option***. In consideration of Participant's past and/or continued employment with or service to the Company and for other good and valuable consideration, effective as of the Grant Date set forth in the Grant Notice, the Company irrevocably grants to Participant an Option to purchase any part or all of an aggregate of the number of Shares set forth in the Grant Notice at the Exercise Price per Share set forth in the Grant Notice, upon the terms and conditions set forth in the Plan and this Agreement.

2. ***Vesting***. The Option shall become vested in such amounts and at such times as are set forth in the vesting schedule in the Grant Notice. The installments provided for in the vesting schedule are cumulative. No portion of the Option which has not become vested at the date Participant incurs a Termination of Service shall thereafter become vested, except as may be otherwise provided by the Administrator or as set forth in another written agreement between the Company and Participant.

3. ***Exercise.***

(a) *Exercisability*. Any portion of the Option or the entire Option may be exercised in whole or in part at any time prior to the time when the Option or portion thereof becomes unexercisable under Section 4, provided that each unvested Share with respect to which the Option is exercised (each a "***Restricted Share***") shall be subject to the Company Repurchase Right (as defined in Section 5 below) for so long as the Option shall remain unvested with respect to such Share under the terms of this Agreement. The Restricted Shares shall be released from the Company Repurchase Right as set forth in Section 5. For the avoidance of doubt, all Shares with respect to which the Option is exercised shall at all times be assumed to be Restricted Shares to the fullest extent possible under the terms of this Agreement, unless otherwise provided by the Administrator.

(b) *Person Eligible to Exercise*. During the lifetime of Participant, only Participant may exercise the Option or any portion thereof. After the death of Participant, any exercisable portion of the Option may, prior to the time when the Option becomes unexercisable under Section 4, be exercised by Participant's personal representative or by any person empowered to do so under the deceased Participant's will or under the then Applicable Laws of descent and distribution.

(c) *Manner of Exercise*. The Option, or any portion thereof, may be exercised solely by delivery to the Secretary of the Company or the Secretary's office, or such other place as may be determined by the Administrator, of all of the following prior to the time when the Option or such portion thereof becomes unexercisable under Section 4:

(i) A written exercise notice in substantially in the form attached as Exhibit B to the Grant Notice (or such other form as is prescribed by the Administrator, which may be an electronic form) (the "***Exercise Notice***") signed by Participant or any other person then entitled to exercise the Option or portion thereof, stating that the Option or portion thereof is thereby exercised, such Exercise Notice complying with all applicable rules established by the Administrator; and

(ii) Subject to Section 5(f) of the Plan, full payment for the Shares with respect to which the Option or portion thereof is exercised by:

(A) Cash or check, payable to the order of the Company; or

(B) With the consent of the Administrator, surrendering shares of Common Stock then issuable upon exercise of the Option valued at their Fair Market Value on the date of exercise; or

(C) On and after the date the Company becomes a Publicly Listed Company, through the (A) delivery by Participant to the Company of an irrevocable and unconditional undertaking by a creditworthy broker to deliver promptly to the Company sufficient funds to pay the exercise price or (B) delivery by Participant to the Company of a copy of irrevocable and unconditional instructions to a creditworthy broker to deliver promptly to the Company cash or a check sufficient to pay the exercise price; or

(D) With the consent of the Administrator, any other form of payment permitted under Section 5(f) of the Plan; or

(E) any combination of the above permitted forms of payment; and

(iii) Subject to Section 9(e) of the Plan, full payment for any applicable withholding taxes in cash or by check or in the form of consideration permitted by the Administrator for the payment of the exercise price pursuant to Section 3(c)(ii) above or pursuant to Section 3(d) below, which, following the date the Company becomes a Publicly Listed Company shall include the method provided for in Section 3(c)(ii)(C) above; and

(iv) In the event the Option or portion thereof shall be exercised pursuant to Section 3.1 by any person or persons other than Participant, appropriate proof of the right of such person or persons to exercise the Option; and

(v) In the event the Option or portion thereof shall be exercised as to Restricted Shares, the following (collectively, the "***Additional Documents***"):

(A) the stock assignment duly endorsed in blank, attached as Exhibit C to the Grant Notice (the "***Stock Assignment***"), executed by Participant; and

(B) if Participant has a spouse of Participant, the Consent of Spouse attached as Exhibit D to the Grant Notice, executed by Participant's spouse.

(d) *Tax Withholding*. The Company shall have the authority and the right to deduct or withhold, or require Participant to remit to the Company, an amount sufficient to satisfy federal, state, local and foreign taxes (including Participant's employment tax obligation) required by law to be withheld with respect to any taxable event concerning Participant arising as a result of the Option or otherwise under this Agreement, including, without limitation, the authority to deduct such amounts from other compensation payable to Participant by the Company.

(e) *Fractional Shares*. The Option may only be exercised for whole shares of Common Stock. Any fractional Shares shall be rounded down to the nearest whole share.

4. ***Expiration of Option***. The Option may not be exercised to any extent by anyone after the first to occur of the following events:

(a) The Expiration Date set forth in the Grant Notice;

(b) The expiration of three months following the date of Participant's Termination of Service, unless such Termination of Service occurs by reason of Participant's death or Disability or Participant's discharge by the Company for Cause;

(c) The expiration of one year following the date of Participant's Termination of Service by reason of Participant's death or Disability;

(d) The date of Participant's Termination of Service as a result of Participant's discharge by the Company for Cause; or

(e) With respect to any unvested portion of the Option, the date that is thirty days following Participant's Termination of Service for any reason other than as a result of Participant's discharge by the Company for Cause, or such shorter period as may be determined by the Administrator.

Participant acknowledges that an Incentive Stock Option exercised more than three months after Participant's termination of status as an Employee, other than by reason of death or Disability, will be taxed as a Non-Qualified Stock Option.

5. ***Company Repurchase Right***.

(a) *Company Repurchase Right*. Upon Participant's Termination of Service for any reason, the Company shall have the right and option to repurchase all of the Restricted Shares from Participant, or Participant's transferee or legal representative, as the case may be, for a purchase price equal to the price per Share paid for such Restricted Shares (the "***Company Repurchase Right***").

(b) *Exercise of Company Repurchase Right*. The Company may exercise the Company Repurchase Right by delivering to Participant (or his or her transferee or legal representative, as the case may be), within ninety days of the date of Participant's Termination of Service, a written notice indicating the Company's intention to exercise the Company Repurchase Right and setting forth a date for closing not later than thirty days from the issuance of such notice. The closing shall take place at the Company's office. At the closing, the holder of the certificates for the Restricted Shares shall deliver the stock certificate or certificates evidencing the Restricted Shares, and the Company shall deliver the purchase price therefore. At its option, the Company may elect to make payment for the Restricted Shares to a bank selected by the Company. The Company shall avail itself of this option by a written notice to Participant stating the name and address of the bank, date of closing, and waiving the closing at the Company's office. If the Company does not elect to exercise the Company Repurchase Right by giving the requisite notice within ninety days following the date of Participant's Termination of Service, the Company Repurchase Right shall terminate.

(c) *Release of Restricted Shares*. The Restricted Shares shall be released from the Company Repurchase Right upon vesting of the Option with respect to such Shares in accordance with the terms of this Agreement. For the avoidance of doubt, all Shares with respect to which the Option is exercised shall at all times be assumed to be Restricted Shares to the fullest extent possible under the terms of this Agreement, unless otherwise provided by the Administrator. Fractional Shares shall be rounded down to the nearest whole share.

6. ***Escrow***. To insure the availability for delivery of the Restricted Shares upon repurchase by the Company pursuant to the Company Repurchase Right, Participant appoints the Secretary of the Company, or such other person designated by the Administrator from time to time as escrow agent, as its attorney-in-fact to sell, assign and transfer unto the Company, such Restricted Shares, if any, repurchased by the Company pursuant to the Company Repurchase Right and shall, upon execution of the applicable Exercise Notice, deliver and deposit with the Secretary of the Company, or such other person designated by the Administrator from time to time, the share certificate(s) representing the Restricted Shares, together with the Stock Assignment. The Restricted Shares and Stock Assignment shall be held by the Secretary, or such other person designated by the Administrator from time to time, in escrow, until the Company exercises the Company Repurchase Right, until such Restricted Shares are released from the Company Repurchase Right as set forth in Section 5 or until such time as this Agreement no longer is in effect. Upon release of the Restricted Shares from the Company's Repurchase Right, the escrow agent shall as soon as reasonably practicable deliver to Participant the certificate or certificates representing such Shares in the escrow agent's possession belonging to Participant, and the escrow agent shall be discharged of all further obligations hereunder. The Company, or its designee, shall not be liable for any act it may do or omit to do with respect to holding the Restricted Shares in escrow and while acting in good faith and in the exercise of its judgment.

7. ***Transferability***.

(a) *Transferability of Option and Restricted Shares*. Neither the Option nor the Restricted Shares shall be sold, assigned, transferred, pledged or otherwise encumbered by Participant, either voluntarily or by operation of law, except by will or the laws of descent and distribution, and, during the life of the Participant, the Option shall be exercisable only by the Participant.

(b) *Transferees Subject to Restrictions*. Any transferee of the Shares shall hold such Shares subject to all of the provisions hereof and the Plan and the Exercise Notice and Additional Documents executed by Purchaser with respect to such Shares.

8. ***Rights as a Stockholder***. Except as otherwise provided herein, upon exercise of the Option and the issuance of the Shares to Participant (as evidenced by the appropriate entry on the books of the Company or of a duly authorized transfer agent of the Company), Participant shall have all the rights of a stockholder with respect to the Restricted Shares, including the right to receive any cash or stock dividends or other distributions paid to or made with respect to the Restricted Shares, subject to the restrictions described in the following sentence, which restrictions shall lapse when the Restricted Shares are released from the Company Repurchase Right as set forth in Section 5. Unless otherwise provided by the Administrator, if any dividends or distributions are paid in shares, or consist of a dividend or distribution to holders of Common Stock of property other than an ordinary cash dividend, the shares or other property will be subject to same restrictions on transferability as the Restricted Shares with respect to which they were paid and shall automatically be forfeited to the Company for no consideration in the event the Company exercises the Company Repurchase Right for the Restricted Shares with respect to which they were paid. In no event shall a dividend or distribution be paid with respect to Restricted Shares later than the end of the calendar year in which the dividends are paid to holders of Common Stock or, if later, the 15th day of the third month following the later of (a) the date the dividends are paid to holders of Common Stock and (b) the date the Restricted Shares with respect to which the dividends are paid vest. Participant shall enjoy rights as a stockholder until such time as Participant disposes of the Shares or the Company and/or its assignee(s) exercises the Right of First Refusal hereunder. Upon such exercise, Participant shall have no further rights as a holder of the Shares so purchased except the right to receive payment for the Shares so purchased in accordance with the provisions of this Agreement, and Participant shall forthwith cause the certificate(s), if any issued, evidencing the Shares so purchased to be surrendered to the Company for transfer or cancellation.

9. ***Restrictive Legends and Stop-Transfer Orders***.

(a) *Legends*. Participant understands and agrees that the Company shall cause any certificates issued evidencing the Shares to have the legends set forth below or legends substantially equivalent thereto, together with any other legends that may be required by Applicable Laws:

> THE SHARES REPRESENTED HEREBY HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED ("ACT"), NOR HAVE THEY BEEN REGISTERED OR QUALIFIED UNDER THE SECURITIES LAWS OF ANY STATE. NO TRANSFER OF SUCH SECURITIES WILL BE PERMITTED UNLESS A REGISTRATION STATEMENT UNDER THE ACT IS IN EFFECT AS TO SUCH TRANSFER, THE TRANSFER IS MADE IN ACCORDANCE WITH RULE 144 UNDER THE ACT, OR IN THE OPINION OF COUNSEL (WHICH MAY BE COUNSEL FOR THE COMPANY) REGISTRATION UNDER THE ACT IS UNNECESSARY IN ORDER FOR SUCH TRANSFER TO COMPLY WITH THE ACT AND WITH APPLICABLE STATE SECURITIES LAWS.
>
> THE SHARES REPRESENTED BY THIS CERTIFICATE MAY BE SUBJECT TO REPURCHASE PURSUANT TO, AND MAY BE TRANSFERRED ONLY IN ACCORDANCE WITH, THE TERMS OF AN AGREEMENT BETWEEN THE COMPANY AND THE STOCKHOLDER, A COPY OF WHICH IS ON FILE WITH THE SECRETARY OF THE COMPANY. SUCH REPURCHASE AND/OR TRANSFER RESTRICTIONS ARE BINDING ON TRANSFEREES OF THESE SHARES.

(b) *Stop Transfer Orders*. Participant agrees that, in order to ensure compliance with the restrictions referred to in the Plan and this Agreement, the Company may issue appropriate "stop transfer" instructions to its transfer agent, if any, and that, if the Company transfers its own securities, it may make appropriate notations to the same effect in its own records.

(c) *Impermissible Transfers Void*. The Company shall not be required (i) to transfer on its books any Shares that have been sold or otherwise transferred in violation of any of the provisions of this Agreement or (ii) to treat as owner of such Shares or to accord the right to vote or pay dividends to any purchaser or other transferee to whom such Shares shall have been so transferred. Any transfer or attempted transfer of the Option or any of the Restricted Shares not in accordance with the terms of this Agreement shall be void

10. ***Taxes***.

(a) *Tax Consequences of Award*. Participant understands that Participant may suffer adverse tax consequences as a result of Participant's purchase or disposition of the Shares. Participant represents that Participant has consulted with any tax consultants Participant deems advisable in connection with the purchase or disposition of the Shares and that Participant is not relying on the Company for any tax advice. Participant is relying solely on such advisors and not on any statements or representations of the Company or any of its agents. Participant understands that Participant (and not the Company) shall be responsible for Participant's tax liability that may arise as a result of the transactions contemplated by this Agreement.

(b) *Section 83(b) Election for Restricted Shares Purchased Pursuant to a Non-Qualified Stock Option*. Participant acknowledges that, with respect to the exercise of a Non-Qualified Stock Option for Restricted Shares, unless an election is filed by Participant with the Internal Revenue Service and, if necessary, the proper state taxing authorities, within thirty days of the purchase of the Shares, electing pursuant to Section 83(b) of the Code (and similar state tax provisions if applicable) to be taxed currently on any difference between the purchase price of the Shares and their Fair Market Value on the date of purchase, there will be a recognition of taxable income to the Purchaser, measured by the excess, if any, of the Fair Market Value of the Shares, at the time the Company Repurchase Right lapses over the purchase price for the Shares. Participant represents that Participant has consulted any tax consultant(s) Participant deems advisable in connection with the purchase of the Shares or the filing of the election under Section 83(b) of the Code and similar tax provisions.

(c) *Section 83(b) Election for Restricted Shares Purchased Pursuant to an Incentive Stock Option*. Participant hereby acknowledges that he or she has been informed that, with respect to the exercise of an Incentive Stock Option for Restricted Shares, unless an election is filed by Participant with the Internal Revenue Service and, if necessary, the proper state taxing authorities, within thirty days of the purchase of the Shares, electing pursuant to Section 83(b) of the Code (and similar state tax provisions if applicable) to be taxed currently on any difference between the purchase price of the Shares and their Fair Market Value on the date of purchase, there will be a recognition of income to the Participant, for alternative minimum tax purposes measured by the excess, if any, of the Fair Market Value of the Shares at the time the Company's Repurchase Option lapses over the purchase price for the Shares. Participant further acknowledges that if an election is filed under Section 83(b) of the Code for the Unvested Shares and such shares are sold or transferred prior to the date two years following the Grant Date and one year following the purchase date of such shares, there will be a recognition of income to the Participant, for ordinary income, measured by the excess, if any, of the Fair Market Value of the Shares at the time the Company's Repurchase Option lapses over the purchase price for the Shares. Participant represents that Participant has consulted any tax consultant(s) Participant deems advisable in connection with the purchase of the Shares or the filing of the election under Section 83(b) and similar tax provisions.

PARTICIPANT ACKNOWLEDGES THAT IT IS PARTICIPANT'S SOLE RESPONSIBILITY AND NOT THE COMPANY'S TO FILE TIMELY THE ELECTION UNDER SECTION 83(B) OF THE CODE, EVEN IF PARTICIPANT REQUESTS THE COMPANY OR ITS REPRESENTATIVE TO MAKE THIS FILING ON PARTICIPANT'S BEHALF.

11. ***Miscellaneous***.

(a) *No Right To Employment or Other Status.* No person shall have any claim or right to be granted an Award, and the grant of an Award shall not be construed as giving a Participant the right to continued employment or any other relationship with the Company. The Company expressly reserves the right at any time to dismiss or otherwise terminate its relationship with a Participant free from any liability or claim under the Plan or this Agreement.

(b) *Notices*. Any notice to be given under the terms of this Agreement to the Company shall be addressed to the Company in care of the Secretary of the Company at the Company's principal office or to the then-current email address for the Secretary of the Company, and any notice to be given to Participant shall be addressed to Participant at the most-recent physical or email address for Participant listed in the Company's personnel records. By a notice given pursuant to this Section 11(b), either party may hereafter designate a different address for notices to be given to that party. Any notice which is required to be given to Participant shall, if Participant is then deceased, be given to the person entitled to exercise his or her Option by written notice under this Section 11(b). Any notice shall be deemed duly given when sent via email or when sent by certified mail (return receipt requested) and deposited (with postage prepaid) in a post office or branch post office regularly maintained by the United States Postal Service.

(c) *Successors and Assigns*. The Company may assign any of its rights under this Agreement and the Exercise Notice to single or multiple assignees, and this Agreement shall inure to the benefit of the successors and assigns of the Company. Subject to the restrictions on transfer herein set forth, this Agreement shall be binding upon Participant and his or her heirs, executors, administrators, successors and assigns.

(d) *Severability*. In the event any portion of the Plan or this Agreement or any action taken pursuant thereto shall be held illegal or invalid for any reason, the illegality or invalidity shall not affect the remaining parts of the Plan and this Agreement, and the Plan and this Agreement shall be construed and enforced as if the illegal or invalid provisions had not been included, and the illegal or invalid action shall be null and void.

(e) *Entire Agreement; Governing Documents*. The Plan, the Grant Notice and this Agreement (including all Exhibits thereto) constitute the entire agreement of the parties and supersede in their entirety all prior undertakings and agreements of the Company and Participant with respect to the subject matter hereof. In the event of any contradiction between the Plan and any Award Agreement or any other written agreement between a Participant and the Company that has been approved by the Administrator, the terms of the Plan shall govern, unless it is expressly specified in such Award Agreement or other written document that a specific provision of the Plan shall not apply.

(f) *Governing Law*. The provisions of the Plan and all Awards made thereunder, including the Option, shall be governed by and interpreted in accordance with the laws of the State of Delaware, disregarding choice-of-law principles of the law of any state that would require the application of the laws of a jurisdiction other than such state.

(g) *Titles and Headings*. The titles and headings of the Sections in this Agreement are for convenience of reference only and, in the event of any conflict, the text of this Agreement, rather than such titles or headings, shall control.

EXHIBIT B

TO STOCK OPTION GRANT NOTICE

FORM OF EXERCISE NOTICE

Effective as of today, _____, _____, the undersigned *("**Participant**")* hereby elects to exercise Participant's option to purchase _____ Shares of Oncternal Therapeutics, Inc. (the "***Company***") under and pursuant to the Oncternal Therapeutics, Inc. 2015 Equity Incentive Plan (the "***Plan***") and the Stock Option Grant Notice and Stock Option Agreement dated _____, 20___ (the "***Agreement***"). Capitalized terms used herein without definition shall have the meanings given in the Agreement.

Grant Date:	_____
Number of Shares as to which Option is Exercised:	_____
Exercise Price per Share:	$_____
Total Exercise Price:	$_____
Certificate to be issued in name of:	_____
Cash Payment delivered herewith:	$_____ (Representing the full Exercise Price for the Shares, as well as any applicable withholding tax)

Type of Option: ☐ Incentive Stock Option ☐ Non-Qualified Stock Option

1. ***Representations of Participant***. Participant acknowledges that Participant has received, read and understood the Plan and the Agreement. Participant agrees to abide by and be bound by their terms and conditions.

2. ***Tax Consultation***. Participant understands that Participant may suffer adverse tax consequences as a result of Participant's purchase or disposition of the Shares. Participant represents that Participant has consulted with any tax consultants Participant deems advisable in connection with the purchase or disposition of the Shares and that Participant is not relying on the Company for any tax advice. Participant is relying solely on such advisors and not on any statements or representations of the Company or any of its agents. Participant understands that Participant (and not the Company) shall be responsible for Participant's tax liability that may arise as a result of this investment or the transactions contemplated by this Agreement.

3. ***Participant Representations***. Participant hereby makes the following certifications and representations with respect to the Shares listed above:

(a) Participant is aware of the Company's business affairs and financial condition and has acquired sufficient information about the Company to reach an informed and knowledgeable decision to acquire the Shares. Participant is acquiring these Shares for investment for Participant's own account only and not with a view to, or for resale in connection with, any "distribution" thereof within the meaning of the Securities Act.

(b) Participant acknowledges and understands that the Shares constitute "restricted securities" under the Securities Act and have not been registered under the Securities Act in reliance upon

a specific exemption therefrom, which exemption depends upon, among other things, the bona fide nature of Participant's investment intent as expressed herein. Participant understands that the Shares must be held indefinitely unless they are subsequently registered under the Securities Act or an exemption from such registration is available. Participant further acknowledges and understands that the Company is under no obligation to register the Shares. Participant understands that the certificate evidencing the Shares will be imprinted with a legend which prohibits the transfer of the Shares unless they are registered or such registration is not required in the opinion of counsel satisfactory to the Company and any other legend required under Applicable Laws.

(c) Participant is familiar with the provisions of Rule 701 and Rule 144, each promulgated under the Securities Act, which, in substance, permit limited public resale of "restricted securities" acquired, directly or indirectly from the issuer thereof, in a non-public offering subject to the satisfaction of certain conditions. Rule 701 provides that if the issuer qualifies under Rule 701 at the time of the grant of the Option to Participant, the exercise will be exempt from registration under the Securities Act. In the event the Company becomes subject to the reporting requirements of Section 13 or 15(d) of the Exchange Act, ninety days thereafter (or such longer period as any market stand-off agreement may require) the securities exempt under Rule 701 may be resold, subject to the satisfaction of certain of the conditions specified by Rule 144.

(d) In the event that the Company does not qualify under Rule 701 at the time of grant of the Option, then the securities may be resold in certain limited circumstances subject to the provisions of Rule 144.

(e) Participant further understands that in the event all of the applicable requirements of Rule 701 or 144 are not satisfied, registration under the Securities Act, compliance with Regulation A, or some other registration exemption will be required; and that, notwithstanding the fact that Rules 144 and 701 are not exclusive, the Staff of the Securities and Exchange Commission has expressed its opinion that persons proposing to sell private placement securities other than in a registered offering and otherwise than pursuant to Rules 144 or 701 will have a substantial burden of proof in establishing that an exemption from registration is available for such offers or sales, and that such persons and their respective brokers who participate in such transactions do so at their own risk. Participant understands that no assurances can be given that any such other registration exemption will be available in such event.

4. ***Notices***. Any notice required or permitted hereunder shall be given in accordance with the provisions set forth in Section 11(b) of the Agreement.

5. ***Entire Agreement***. The Plan and Agreement are incorporated herein by reference. This Notice, the Plan and the Agreement constitute the entire agreement of the parties and supersede in their entirety all prior undertakings and agreements of the Company and Participant with respect to the subject matter hereof.

ACCEPTED BY:	**SUBMITTED BY**
ONCTERNAL THERAPEUTICS, INC.	**PARTICIPANT:**
By: _____	By: _____
Print Name: _____	Print Name: _____
Title: _____	

EXHIBIT C

TO STOCK OPTION GRANT NOTICE

STOCK ASSIGNMENT

[*See instructions below*]

FOR VALUE RECEIVED I, _____, hereby sell, assign and transfer unto _____ the shares of the Common Stock of Oncternal Therapeutics, Inc. registered in my name on the books of said corporation represented by Certificate No. __ and do hereby irrevocably constitute and appoint _____to transfer the said stock on the books of the within named corporation with full power of substitution in the premises.

This Assignment Separate from Certificate may be used only in accordance with the Stock Option Grant Notice and Stock Option Agreement between Oncternal Therapeutics, Inc. and the undersigned dated _____, 20__.

Dated:_____, ____

Signature: _____

INSTRUCTIONS: Please do not fill in any blanks other than the signature line. The purpose of this assignment is to enable the Company to exercise the Company Repurchase Right, as set forth in the Stock Option Grant Notice and Stock Option Agreement, without requiring additional signatures on the part of Purchaser.

EXHIBIT D

TO STOCK OPTION GRANT NOTICE

CONSENT OF SPOUSE

I, _____, spouse of _____, have read and approve the Stock Option Grant Notice and Stock Option Agreement dated _____, 20__, between my spouse and Oncternal Therapeutics, Inc. In consideration of granting of the right to my spouse to purchase shares of Oncternal Therapeutics, Inc. set forth in the Stock Option Grant Notice and Stock Option Agreement, I hereby appoint my spouse as my attorney-in-fact in respect to the exercise of any rights under the Stock Option Grant Notice and Stock Option Agreement and agree to be bound by the provisions of the Stock Option Grant Notice and Stock Option Agreement insofar as I may have any rights in said Stock Option Grant Notice and Stock Option Agreement or any shares issued pursuant thereto under the community property laws or similar laws relating to marital property in effect in the state of our residence as of the date of the signing of the Stock Option Grant Notice and Stock Option Agreement or the exercise of the option granted thereunder.

Dated: _____, ____

_____

Signature of Spouse

INSTRUCTIONS: Please do not fill in the blanks other than the signature line. The purpose of this assignment is to enable the Company to exercise its "Repurchase Option," as set forth in the Stock Option Grant Notice and Stock Option Agreement, without requiring additional signatures on the part of Participant.

FORM OF 83(B) ELECTION AND INSTRUCTIONS

These instructions are provided to assist you if you choose to make an election under Section 83(b) of the Internal Revenue Code, as amended, with respect to the shares of common stock of Oncternal Therapeutics, Inc. transferred to you. **Please consult with your personal tax advisor as to whether an election of this nature will be in your best interests in light of your personal tax situation.**

The executed original of the Section 83(b) election must be filed with the Internal Revenue Service not later than 30 days after the date the shares were transferred to you. **There is no remedy for failure to file on time.** The steps outlined below should be followed to ensure the election is mailed and filed correctly and in a timely manner. **If you make the Section 83(b) election, the election is irrevocable.**

Complete the Section 83(b) election form (attached as Attachment 1) and make four (4) copies of the signed election form. Your spouse, if any, should sign the Section 83(b) election form as well.

Prepare the cover letter to the Internal Revenue Service (sample letter attached as Attachment 2).

Send the cover letter with the originally executed Section 83(b) election form and one (1) copy via certified mail, return receipt requested to the Internal Revenue Service at the address of the Internal Revenue Service where you file your personal tax returns. We suggest that you have the package date-stamped at the post office. The post office will provide you with a certified receipt that includes a dated postmark. Enclose a self-addressed, stamped envelope so that the Internal Revenue Service may return a date-stamped copy to you. However, your postmarked receipt is your proof of having timely filed the Section 83(b) election if you do not receive confirmation from the Internal Revenue Service.

One (1) copy must be sent to Oncternal Therapeutics, Inc. for its records and **one (1) copy must be attached to your federal income tax return for the applicable calendar year**.

Retain the Internal Revenue Service file stamped copy (when returned) for your records.

Please consult your personal tax advisor for the address of the office of the Internal Revenue Service to which you should mail your election form.

ATTACHMENT 1

ELECTION UNDER INTERNAL REVENUE CODE SECTION 83(B)

The undersigned taxpayer hereby elects, pursuant to Section 83(b) of the Internal Revenue Code of 1986, as amended, to include in taxpayer's gross income for the current taxable year the amount of any compensation taxable to taxpayer in connection with taxpayer's receipt of shares (the "***Shares***") of Common Stock of Oncternal Therapeutics, Inc., a Delaware corporation (the "***Company***").

The name, address and taxpayer identification number of the undersigned taxpayer are:

_____
_____
_____

SSN:_____

The name, address and taxpayer identification number of the Taxpayer's spouse are (complete if applicable):

_____
_____
_____

SSN:_____

Description of the property with respect to which the election is being made:

_____ (_____) shares of Common Stock of the Company.

The date on which the property was transferred was _____. The taxable year to which this election relates is calendar year ____.

Nature of restrictions to which the property is subject:

The Shares are subject to repurchase by the Company or its assignee upon the occurrence of certain events. This repurchase right lapses based upon the continued performance of services by the taxpayer over time.

The fair market value at the time of transfer (determined without regard to any lapse restrictions, as defined in Treasury Regulation Section 1.83-3(i)) of the Shares was $_____ per Share.

The amount paid by the taxpayer for the Shares was _____ per share.

A copy of this statement has been furnished to the Company.

Dated:_____, ____ Taxpayer Signature: _____

The undersigned spouse of Taxpayer joins in this election. (Complete if applicable).

Dated:_____ Spouse's Signature: _____

ATTACHMENT 2

SAMPLE COVER LETTER TO INTERNAL REVENUE SERVICE

_____, ___

VIA CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Internal Revenue Service
[Address where taxpayer files returns]

Re: Election under Section 83(b) of the Internal Revenue Code of 1986

Taxpayer:_____

Taxpayer's Social Security Number:_____

Taxpayer's Spouse:_____

Taxpayer's Spouse's Social Security Number:_____

Ladies and Gentlemen:

Enclosed please find an original and one copy of an Election under Section 83(b) of the Internal Revenue Code of 1986, as amended, being made by the taxpayer referenced above. Please acknowledge receipt of the enclosed materials by stamping the enclosed copy of the Election and returning it to me in the self-addressed stamped envelope provided herewith.

Very truly yours,

_____

Enclosures

cc: Oncternal Therapeutics, Inc.

ONCTERNAL THERAPEUTICS, INC.

RESTRICTED STOCK PURCHASE AGREEMENT

THIS RESTRICTED STOCK PURCHASE AGREEMENT ("***Agreement***") is made as of May 22, 2017, by and between **ONCTERNAL THERAPEUTICS, INC.**, a Delaware corporation (the "***Company***") and Richard Vincent (the "***Purchaser***").

The parties agree as follows:

1. Sale of Stock. The Company hereby agrees to sell to the Purchaser and the Purchaser hereby agrees to purchase an aggregate of Four Hundred Thousand (400,000) shares of the Company's Common Stock (par value $0.0001 per share) at a purchase price of $0.0001 per share (the "***Shares***"), for an aggregate purchase price of Forty Dollars ($40.00).

2. Payment of Purchase Price. The payment of the purchase price shall be by cash, check or wire transfer.

3. Repurchase Option. In the event of any voluntary or involuntary termination of the services of the Purchaser to the Company for any or no reason before all of the Shares are released from the Company's Repurchase Option (as defined below), the Company shall, upon the date of such termination (as reasonably fixed and determined by the Company), have an irrevocable, exclusive option, but not the obligation, for a period of ninety (90) days from such date to repurchase all or any portion of the Unreleased Shares (as defined below in Section 4) at such time (the "***Repurchase Option***") at the original purchase price per share (the "***Repurchase Price***"). The Repurchase Option shall be exercisable by the Company by written notice to the Purchaser or the Purchaser's executor and shall be exercisable by delivery to the Purchaser or the Purchaser's executor of cash, check or wire transfer in an amount equal to the Repurchase Price times the number of Shares to be repurchased (the "***Aggregate Repurchase Price***"). Upon delivery of such notice and the payment of the Aggregate Repurchase Price, the Company shall become the legal and beneficial owner of the Shares being repurchased and all rights and interests therein or relating thereto, and the Company shall have the right to retain and transfer to its own name the number of Shares being repurchased by the Company. The Repurchase Option set forth in this Section 3 may be assigned by the Company in whole or in part in its sole and unfettered discretion.

4. Release of Shares From Repurchase Option.

(a) The Shares shall be released from the Company's Repurchase Option pursuant to the following schedule:

100% of the Shares (the "***Restricted Shares***") shall be subject to the Repurchase Option. 1/4th of the Restricted Shares shall be released from the Repurchase Option on the one (1) year anniversary of April 13, 2017 (the "***Vesting Commencement Date***") and 1/48th of the Restricted Shares shall be released from the Repurchase Option on each monthly anniversary following the Vesting Commencement Date such that all of the Restricted Shares shall be released from the Repurchase Option on the fourth (4th) year anniversary of the Vesting Commencement Date, subject to Purchaser's continuous employment or service to the Company on each such vesting date.

Any of the Shares which, from time to time, have not yet been released from the Repurchase Option are referred to herein as "***Unreleased Shares***." The number of Shares released each month from the Repurchase Option shall be rounded down to the next whole number of Option Shares, except in the last month of the fourth (4th) year period when all Unreleased Shares shall be released from the Repurchase Option.

(b) Subject to Section 7, the Shares which have been released from the Repurchase Option shall be delivered to the Purchaser at the Purchaser's request.

5. Restriction on Transfer. Except for the escrow described below in Section 7, none of the Shares or any beneficial interest therein shall be transferred, encumbered or otherwise disposed of in any manner until the release of such Shares from the Repurchase Option in accordance with the provisions of this Agreement.

6. Marital Dissolution or Legal Separation.

(a) Notwithstanding anything in this Agreement to the contrary, in connection with the dissolution of Purchaser's marriage or the legal separation of Purchaser and Purchaser's spouse, the Company shall have the right (the "***Special Purchase Right***"), if applicable, to purchase from Purchaser's spouse, in accordance with the provisions of this Section 6, all or any portion of the Shares which would otherwise be awarded to such spouse in settlement of any community property or other marital property rights such spouse may have in such shares.

(b) Purchaser shall promptly provide the Company with written notice (the "***Dissolution Notice***") of (i) the entry of any judicial decree or order resolving the property rights of Purchaser and Purchaser's spouse in connection with their marital dissolution or legal separation or (ii) the execution of any contract or agreement relating to the distribution or division of such property rights. The Dissolution Notice shall be accompanied by a copy of the actual decree or order of dissolution or contract or agreement between Purchaser and Purchaser's spouse which provides for the award to the spouse of one or more Shares in settlement of any community property or other marital property rights such spouse may have in such shares.

(c) The Special Purchase Right shall be exercisable by delivery of written notice (the "***Purchase Notice***") to Purchaser and Purchaser's spouse within forty-five (45) days after the Company's receipt of the Dissolution Notice. The Purchase Notice shall indicate the number of Shares to be purchased by the Company, the date such purchase is to be effected (such date to be not less than five (5) business days, nor more than fifteen (15) business days, after the date of the Purchase Notice) and the fair market value to be paid for such Shares. Purchaser (or Purchaser's spouse, to the extent such spouse has physical possession of the Shares) shall, prior to the close of business on the date specified for the purchase, deliver to the Company the certificates representing the shares to be purchased. The Company shall, concurrently with the receipt of the stock certificates, pay to Purchaser's spouse (in cash or cash equivalents) an amount equal to the fair market value specified for such shares in the Purchase Notice.

(d) If Purchaser's spouse does not agree with the fair market value specified for the Shares in the Purchase Notice, then the spouse shall promptly notify the Company in writing of such disagreement and the fair market value of such Shares shall thereupon be determined by an appraiser of recognized standing selected by the Company and the spouse. If they cannot agree on an appraiser within fifteen (15) days after the date of the Purchase Notice, each shall select an appraiser of recognized standing, and the two (2) appraisers shall designate a third appraiser of recognized standing whose appraisal shall be determinative of such value. The cost of the appraisal shall be shared equally by the Company and Purchaser's spouse. The closing shall then be held on the fifteenth (15th) business day following the completion of such appraisal; provided, however, that if the appraised value is more than twenty-five percent (25%) greater than the fair market value specified for the Shares in the Purchase Notice, the Company shall have the right, exercisable prior to the expiration of such fifteen (15) business-day period, to rescind the exercise of the Special Purchase Right and thereby revoke its election to purchase the Shares awarded to the spouse.

(e) The Special Purchase Right shall lapse upon the earlier to occur of (i) the lapse of the Repurchase Option or (ii) the expiration of the exercise period specified in this Section 6, to the extent the Special Purchase Right is not timely exercised in accordance with such this Section 6.

7. Escrow of Shares. Pursuant to the terms of the Joint Escrow Instructions attached hereto as Exhibit A, the Shares issued under this Agreement shall be held by the Escrow Agent (as defined in such Joint Escrow Instructions) along with a stock assignment executed by the Purchaser in blank in the form attached hereto as Exhibit B. Notwithstanding the monthly vesting set forth in Section 4 above, neither the Company nor the Escrow Agent shall be required to release or issue certificates evidencing the Shares to the Purchaser more frequently than twice in any calendar year.

8. Investment Representations. In connection with the purchase of the Shares, the Purchaser represents to the Company the following:

(a) The Shares to be purchased by the Purchaser hereunder will be acquired for investment for the Purchaser's own account and not with a view to the public resale or distribution thereof within the meaning of the Securities Act of 1933, as amended (the "***Securities Act***").

(b) The Purchaser has received or has had full access to all the information the Purchaser considers necessary or appropriate to make an informed investment decision with respect to the Shares.

(c) The Purchaser understands that the purchase of the Shares involves substantial risk. The Purchaser: (i) has experience as an investor in securities of companies in the development stage and acknowledges that the Purchaser is able to fend for itself, can bear the economic risk of the Purchaser's investment in the Shares and has such knowledge and experience in financial or business matters that it is capable of evaluating the merits and risks of its investment in the Shares and protecting its investment; and/or (ii) has a preexisting business relationship with the Company and/or certain of its other officers, directors or controlling persons of a nature and duration that enables the Purchaser to be aware of the character, business acumen and financial circumstances of such persons.

(d) The Purchaser has not been solicited to offer to purchase or to purchase any Shares by means of any general solicitation or advertising within the meaning of Regulation D promulgated under the Securities Act ("***Regulation D***").

(e) The Purchaser is not a person of the type described in Section 506(d) of Regulation D that would disqualify the Company from engaging in a transaction pursuant to Section 506 of Regulation D.

(f) The Purchaser understands that the Shares are characterized as "restricted securities" under the Securities Act, in a transaction not involving a public offering and that under the Securities Act and applicable regulations thereunder such securities may be resold without registration under the Securities Act only in certain limited circumstances. The Purchaser represents that it is familiar with Rule 144 of the Securities and Exchange Commission and understands the resale limitations imposed thereby and by the Securities Act. The Purchaser understands that the Company is under no obligation to register any of the securities sold hereunder.

9. Stock Certificate Legends; Other Restrictions.

(a) The share certificate evidencing the Shares issued hereunder shall be endorsed with the following legends:

i. THE SHARES REPRESENTED BY THIS CERTIFICATE HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "ACT"), AND HAVE BEEN ACQUIRED FOR INVESTMENT AND NOT WITH A VIEW TO, OR IN CONNECTION WITH, THE SALE OR DISTRIBUTION THEREOF. NO SUCH SALE, TRANSFER OR DISTRIBUTION MAY BE EFFECTED WITHOUT AN EFFECTIVE REGISTRATION STATEMENT RELATED THERETO OR AN APPLICABLE EXEMPTION FROM THE REGISTRATION REQUIREMENTS UNDER THE ACT.

ii. THE SHARES REPRESENTED BY THIS CERTIFICATE ARE SUBJECT TO A RIGHT OF FIRST REFUSAL OPTION IN FAVOR OF THE CORPORATION AND/OR ITS ASSIGNEE(S), AS PROVIDED IN THE BYLAWS OF THE CORPORATION, A COPY OF WHICH ARE ON FILE WITH THE SECRETARY OF THE CORPORATION.

iii. Any legend required by any applicable state securities laws.

(b) Purchaser further acknowledges that it is a condition to the issuance of the Shares to Purchaser that Purchaser agrees to be bound by the terms and conditions of, and become a party to, any stockholders', voting or similar agreements of the Company, as required by the terms of such agreements. Purchaser hereby agrees to be so bound and to execute any additional documents as may be deemed necessary or advisable by the Company in order to effectuate the foregoing agreements.

10. Market Stand-Off Agreement. The Purchaser hereby agrees, if so requested by the managing underwriters or the Company in connection with the initial public offering of the Company's Common Stock, that, without the prior written consent of such managing underwriters, the Purchaser will not offer, sell, contract to sell, grant any option to purchase, make any short sale or otherwise dispose of, assign any legal or beneficial interest in or make a distribution of any capital stock of the Company held by or on behalf of the Purchaser or beneficially owned by the Purchaser in accordance with the rules and regulations of the Securities and Exchange Commission for a period of up to 180 days after the date of the final prospectus relating to the Company's initial public offering.

11. Adjustment for Stock Split. All references to the number of Shares and the purchase price of the Shares in this Agreement shall be appropriately adjusted to reflect any stock split, reverse stock split or stock dividend or other similar change in the Shares which may be made by the Company after the date of this Agreement.

12. Tax Consequences. The Purchaser has reviewed with the Purchaser's own tax advisors the federal, state, local and foreign tax consequences of this investment and the transactions contemplated by this Agreement. The Purchaser is relying solely on such advisors and not on any statements or representations of the Company or any of its agents. The Purchaser understands that the Purchaser (and not the Company) shall be responsible for the Purchaser's own tax liability that may arise as a result of this investment or the transactions contemplated by this Agreement. The Purchaser understands that Section 83 of the Internal Revenue Code of 1986, as amended (the "Code"), taxes as ordinary income both (i) the difference between the fair market value of the Shares when the Company granted the Purchaser the right to purchase the Shares and the fair market value of the Shares on the date of this Agreement, and (ii) the difference between the amount paid for the Shares and the fair market value of the Shares as of the date any restrictions on the Shares lapse. In this context, "restriction" includes the right of the Company to buy back

the Shares pursuant to its repurchase option. In the event the Company has registered under the Exchange Act, "restriction" with respect to officers, directors and 10% shareholders also means the period after the purchase of the Shares during which such officers, directors and 10% shareholders could be subject to suit under Section 16(b) of the Exchange Act. The Purchaser understands that the Purchaser may elect to be taxed at the time the Shares are purchased rather than when and as the Company's repurchase option or 16(b) period expires by filing an election under Section 83(b) of the Code with the I.R.S. within 30 days from the date of purchase.

THE PURCHASER ACKNOWLEDGES THAT IT IS THE PURCHASER'S SOLE RESPONSIBILITY AND NOT THE COMPANY'S TO TIMELY FILE THE ELECTION UNDER SECTION 83(b), EVEN IF THE PURCHASER REQUESTS THE COMPANY OR ITS REPRESENTATIVES TO MAKE THIS FILING ON THE PURCHASER'S BEHALF.

13. California Corporate Securities Law. THE SALE OF THE SECURITIES WHICH ARE THE SUBJECT OF THIS AGREEMENT HAS NOT BEEN QUALIFIED WITH THE COMMISSIONER OF CORPORATIONS OF THE STATE OF CALIFORNIA AND THE ISSUANCE OF SUCH SECURITIES OR THE PAYMENT OR RECEIPT OF ANY PART OF THE CONSIDERATION THEREFORE PRIOR TO SUCH QUALIFICATION IS UNLAWFUL, UNLESS THE SALE OF SECURITIES IS EXEMPT FROM THE QUALIFICATION BY SECTION 25100, 25102, OR 25105 OF THE CALIFORNIA CORPORATIONS CODE. THE RIGHTS OF ALL PARTIES TO THIS AGREEMENT ARE EXPRESSLY CONDITIONED UPON SUCH QUALIFICATION BEING OBTAINED, UNLESS THE SALE IS SO EXEMPT.

14. General Provisions.

(a) This Agreement shall be governed by the laws of the State of California. This Agreement represents the entire agreement between the parties with respect to the purchase of Common Stock by the Purchaser and may only be modified or amended in writing signed by both parties.

(b) Any notice, demand or request required or permitted to be given by either the Company or the Purchaser pursuant to the terms of this Agreement shall be in writing and shall be deemed given when delivered personally or deposited in the U.S. mail, First Class with postage prepaid, and addressed to the parties at the addresses of the parties set forth at the end of this Agreement or such other address as a party may request by notifying the other in writing.

(c) The rights and benefits of the Company under this Agreement shall be transferable to any one or more persons or entities, and all covenants and agreements hereunder shall inure to the benefit of, and be enforceable by the Company's successors and assigns. The rights and obligations of the Purchaser under this Agreement may only be assigned with the prior written consent of the Company and any purported transfer otherwise shall be null and void.

(d) Either party's failure to enforce any provision or provisions of this Agreement shall not in any way be construed as a waiver of any such provision or provisions, nor prevent that party thereafter from enforcing each and every other provision of this Agreement. The rights granted both parties herein are cumulative and shall not constitute a waiver of either party's right to assert all other legal remedies available to it under the circumstances.

(e) The Purchaser agrees upon request to execute any further documents or instruments necessary or desirable to carry out the purposes or intent of this Agreement.

(f) PURCHASER ACKNOWLEDGES AND AGREES THAT THE LAPSING OF THE REPURCHASE OPTION PURSUANT TO SECTION 4 HEREOF IS EARNED ONLY BY THE CONTINUING SERVICE OF THE PURCHASER TO THE COMPANY (AND NOT THROUGH THE ACT OF BEING HIRED OR PURCHASING SHARES HEREUNDER). PURCHASER FURTHER ACKNOWLEDGES AND AGREES THAT THIS AGREEMENT, THE TRANSACTIONS CONTEMPLATED HEREUNDER AND THE REPURCHASE OPTION SCHEDULE SET FORTH HEREIN DO NOT CONSTITUTE AN EXPRESS OR IMPLIED PROMISE OF CONTINUED ENGAGEMENT OF THE PURCHASER AS A SERVICE PROVIDER FOR SUCH PERIOD, FOR ANY PERIOD, OR AT ALL, AND SHALL NOT INTERFERE WITH THE COMPANY'S RIGHT TO TERMINATE THE PURCHASER'S SERVICE TO THE COMPANY AT ANY TIME, WITH OR WITHOUT CAUSE.

(g) Purchaser has reviewed this Agreement in its entirety, has had an opportunity to obtain the advice of counsel prior to executing this Agreement and fully understands all provisions of this Agreement.

[Remainder of page intentionally left blank]

IN WITNESS WHEREOF, the parties have duly executed this Agreement as of the date first set forth above.

COMPANY:

ONCTERNAL THERAPEUTICS, INC.,
a Delaware Corporation

By: /s/ James B. Breitmeyer
Name: James B. Breitmeyer, M.D., Ph.D.
Title: Chief Executive Officer

Address: 3525 Del Mar Heights Rd., #821
San Diego, CA 92130

PURCHASER:

RICHARD VINCENT

/s/ Richard Vincent

Address: 4732 Finchley Terrace
San Diego, CA 92130

CONSENT OF SPOUSE

I, Stacy K. Vincent, spouse of Richard Vincent, have read and approve the foregoing Agreement. In consideration of granting of the right to my spouse to purchase shares of Oncternal Therapeutics, Inc. as set forth in the Agreement, I hereby appoint my spouse as my attorney-in-fact in respect to the exercise of any rights under the Agreement and agree to be bound by the provisions of the Agreement insofar as I may have any rights in said Agreement or any shares issued pursuant thereto under the community property laws of the State of California or similar laws relating to marital property in effect in the state of our residence as of the date of the signing of the foregoing Agreement.

Dated: May 22, 2017

/s/ Stacy K. Vincent
Signature

EXHIBIT A

JOINT ESCROW INSTRUCTIONS

May 22, 2017

Oncternal Therapeutics, Inc.
Attention: Secretary

Ladies and Gentlemen:

As escrow agent (the "***Escrow Agent***") for both Oncternal Therapeutics, Inc., a Delaware corporation (the "***Company***"), and the undersigned purchaser of stock of the Company (the "***Purchaser***"), you are hereby authorized and directed to hold the documents delivered to you pursuant to the terms of that certain Restricted Stock Purchase Agreement ("***Agreement***") between the Company and the undersigned (the "***Escrow***"), in accordance with the following instructions:

1. In the event the Company and/or any assignee of the Company (referred to collectively for convenience herein as the "***Company***") exercises the Company's Repurchase Option as defined in the Agreement), the Company shall give to Purchaser and you a written notice specifying the number of shares of stock to be purchased, the purchase price and the time for a closing hereunder at the principal office of the Company. Purchaser and the Company hereby irrevocably authorize and direct you to close the transaction contemplated by such notice in accordance with the terms of said notice.

2. At the closing, you are directed (a) to date the stock assignments necessary for the transfer in question, (b) to fill in the number of shares being transferred, and (c) to deliver same, together with the certificate evidencing the shares of stock to be transferred, to the Company or its assignee, against the simultaneous delivery to you of the purchase price (by cash, a check, cancellation of indebtedness or some combination thereof) for the number of shares of stock being purchased pursuant to the exercise of the Company's repurchase option.

3. Purchaser irrevocably authorizes the Company to deposit with you any certificates evidencing shares of stock to be held by you hereunder and any additions and substitutions to said shares as defined in the Agreement. Purchaser does hereby irrevocably constitute and appoint you as Purchaser's attorney-in-fact and agent for the term of this Escrow to execute with respect to such securities all documents necessary or appropriate to make such securities negotiable and to complete any transaction herein contemplated, including but not limited to the filing with any applicable state blue sky authority of any required applications for consent to, or notice of transfer of, the securities. Subject to the provisions of the Agreement and of this Escrow Agreement, Purchaser shall exercise all rights and privileges of a shareholder of the Company while the stock is held by you.

4. Upon written request of the Purchaser, but no more than twice per calendar year, unless the Company's repurchase option has been exercised, you will deliver to Purchaser a certificate or certificates representing so many shares of stock as are not then subject to the Company's repurchase option. Within 90 days after cessation of Purchaser's continuous employment by and/or service to the Company, or any parent or subsidiary of the Company, you will deliver to Purchaser a certificate or certificates representing the aggregate number of shares held or issued pursuant to the Agreement and not purchased by the Company or its assignees pursuant to exercise of the Company's repurchase option.

5. If at the time of termination of this escrow you should have in your possession any documents, securities or other property belonging to Purchaser, you shall deliver all of the same to Purchaser and shall be discharged of all further obligations hereunder.

6. Your duties hereunder may be altered, amended, modified or revoked only by a writing signed by all of the parties hereto.

7. You shall be obligated only for the performance of such duties as are specifically set forth herein and may rely and shall be protected in relying or refraining from acting on any instrument reasonably believed by you to be genuine and to have been signed or presented by the proper party or parties. You shall not be personally liable for any act you may do or omit to do hereunder as Escrow Agent or as attorney-in-fact for Purchaser while acting in good faith, and any act done or omitted by you pursuant to the advice of your own attorneys shall be conclusive evidence of such good faith.

8. You are hereby expressly authorized to disregard any and all warnings given by any of the parties hereto or by any other person or corporation, excepting only orders or process of courts of law and are hereby expressly authorized to comply with and obey orders, judgments or decrees of any court. In case you obey or comply with any such order, judgment or decree, you shall not be liable to any of the parties hereto or to any other person, firm or corporation by reason of such compliance, notwithstanding any such order, judgment or decree being subsequently reversed, modified, annulled, set aside, vacated or found to have been entered without jurisdiction.

9. You shall not be liable in any respect on account of the identity, authorities or rights of the parties executing or delivering or purporting to execute or deliver the Agreement or any documents or papers deposited or called for hereunder.

10. You shall not be liable for the outlawing of any rights under the Statute of Limitations with respect to these Joint Escrow Instructions or any documents deposited with you.

11. You shall be entitled to employ such legal counsel and other experts as you may deem necessary properly to advise you in connection with your obligations hereunder, may rely upon the advice of such counsel, and may pay such counsel reasonable compensation therefor.

12. Your responsibilities as Escrow Agent hereunder shall terminate if you shall cease to be an officer or agent of the Company or if you shall resign by written notice to each party. In the event of any such termination, the Company shall appoint a successor Escrow Agent.

13. If you reasonably require other or further instruments in connection with these Joint Escrow Instructions or obligations in respect hereto, the necessary parties hereto shall join in furnishing such instruments.

14. It is understood and agreed that should any dispute arise with respect to the delivery and/or ownership or right of possession of the securities held by you hereunder, you are authorized and directed to retain in your possession without liability to anyone all or any part of said securities until such disputes shall have been settled either by mutual written agreement of the parties concerned or by a final order, decree or judgment of a court of competent jurisdiction after the time for appeal has expired and no appeal has been perfected, but you shall be under no duty whatsoever to institute or defend any such proceedings.

15. Any notice required or permitted hereunder shall be given in writing and shall be deemed effectively given upon personal delivery or upon deposit in the United States Post Office, by registered or certified mail with postage and fees prepaid, addressed to each of the other parties thereunto entitled at the following addresses or at such other addresses as a party may designate by ten days' advance written notice to each of the other parties hereto.

COMPANY:	Oncternal Therapeutics, Inc. 3525 Del Mar Heights Rd., #821 San Diego, CA 92130 Attention: Secretary
PURCHASER	At the address listed after his or her signature.
ESCROW AGENT:	Oncternal Therapeutics, Inc. 3525 Del Mar Heights Rd., #821 San Diego, CA 92130 Attention: Secretary

16. By signing these Joint Escrow Instructions, you become a party hereto only for the purpose of said Joint Escrow Instructions; you do not become a party to the Agreement.

17. This instrument shall be binding upon and inure to the benefit of the parties hereto, and their respective successors and permitted assigns.

18. These Joint Escrow Instructions shall be governed by, and construed and enforced in accordance with, the laws of the State of California.

Very truly yours,

ONCTERNAL THERAPEUTICS, INC.

By: /s/ James B. Breitmeyer
Name: James B. Breitmeyer, M.D., Ph.D.
Title: Chief Executive Officer

PURCHASER:

RICHARD VINCENT

/s/ Richard Vincent
Address: 4732 Finchley Terrace
San Diego, CA 92130

ESCROW AGENT:

ONCTERNAL THERAPEUTICS, INC.

By: /s/ Richard Vincent
Name: Richard Vincent
Title: Secretary

EXHIBIT B

ASSIGNMENT SEPARATE FROM CERTIFICATE

FOR VALUE RECEIVED I, the undersigned, hereby sell, assign and transfer unto _____, _____ shares of the Common Stock of Oncternal Therapeutics, Inc. standing in my name of the books of said corporation represented by Certificate No. _____ herewith and do hereby irrevocably constitute and appoint Oncternal Therapeutics, Inc., to transfer the said stock on the books of the within named corporation with full power of substitution in the premises.

This Stock Assignment may be used only in accordance with the Restricted Stock Purchase Agreement between Oncternal Therapeutics, Inc. and the undersigned dated as of May 22, 2017.

Dated: _____, 2017

RICHARD VINCENT

By: /s/ Richard Vincent

INSTRUCTIONS: Please do not fill in the blanks other than the signature line. The purpose of this assignment is to enable the Company to exercise its "Repurchase Option," as set forth in the Agreement, without requiring additional signatures on the part of the Purchaser.

ELECTION UNDER INTERNAL REVENUE CODE SECTION 83(B)

The undersigned taxpayer hereby elects, pursuant to Section 83(b) of the Internal Revenue Code of 1986, as amended, to include in taxpayer's gross income for the current taxable year the amount of any compensation taxable to taxpayer in connection with taxpayer's receipt of shares (the "Shares") of Common Stock of Oncternal Therapeutics, Inc., a Delaware corporation (the "Company").

1. The name, address and taxpayer identification number of the undersigned taxpayer are:

   RICHARD VINCENT

   _____

   _____

   SSN: ____-____-____

   The name, address and taxpayer identification number of the Taxpayer's spouse are (complete if applicable):

   _____

   _____

   _____

   SSN: ____-____-____

   Descriptionof the property with respect to which the election is being made:

   _____shares of Common Stock of the Company.

2. The date on which the property was transferred was _____, 2017. The taxable year to which this election relates is calendar year 2017.

3. Nature of restrictions to which the property is subject:

   The Shares are subject to repurchase at their original purchase price if unvested as of the date of termination of employment, directorship or consultancy with the Company.

4. The fair market value at the time of transfer (determined without regard to any lapse restrictions, as defined in Treasury Regulation Section 1.83-3(a)) of the Shares was $0.05 per share.

5. The amount paid by the taxpayer for Shares was $0.0001 per share.

6. A copy of this statement has been furnished to the Company.

Dated: _____ Taxpayer Signature _____

The undersigned spouse of Taxpayer joins in this election. (Complete if applicable).

Dated: _____ Spouse's Signature _____

ONCTERNAL THERAPEUTICS, INC.

RESTRICTED STOCK PURCHASE AGREEMENT

THIS RESTRICTED STOCK PURCHASE AGREEMENT ("***Agreement***") is made as of December 14, 2017, by and between **ONCTERNAL THERAPEUTICS, INC.**, a Delaware corporation (the "***Company***") and Richard G. Vincent (the "***Purchaser***").

The parties agree as follows:

1. Issuance of Stock. The Company hereby agrees to issue to the Purchaser, and the Purchaser hereby agrees to accept, an aggregate of One Hundred Fifty Five Thousand Eight Hundred Ninety Seven (155,897) shares of the Company's Common Stock (par value $0.0001 per share) (the "***Shares***"), in consideration of past or future services to the Company by the Purchaser.

2. Repurchase Option. In the event of any voluntary or involuntary termination of the services of the Purchaser to the Company for any or no reason before all of the Shares are released from the Company's Repurchase Option (as defined below), the Company shall, upon the date of such termination (as reasonably fixed and determined by the Company), have an irrevocable, exclusive option, but not the obligation, for a period of ninety (90) days from such date to repurchase all or any portion of the Unreleased Shares (as defined below in Section 3) at such time (the "***Repurchase Option***") at a purchase price of $0.0001 per share (the "***Repurchase Price***"). The Repurchase Option shall be exercisable by the Company by written notice to the Purchaser or the Purchaser's executor and shall be exercisable by delivery to the Purchaser or the Purchaser's executor of cash, check or wire transfer in an amount equal to the Repurchase Price times the number of Shares to be repurchased (the "***Aggregate Repurchase Price***"). Upon delivery of such notice and the payment of the Aggregate Repurchase Price, the Company shall become the legal and beneficial owner of the Shares being repurchased and all rights and interests therein or relating thereto, and the Company shall have the right to retain and transfer to its own name the number of Shares being repurchased by the Company. The Repurchase Option set forth in this Section 2 may be assigned by the Company in whole or in part in its sole and unfettered discretion.

3. Release of Shares From Repurchase Option.

(a) The Shares shall be released from the Company's Repurchase Option pursuant to the following schedule:

100% of the Shares (the "***Restricted Shares***") shall be subject to the Repurchase Option. 1/4th of the Restricted Shares shall be released from the Repurchase Option on the one (1) year anniversary of December 14, 2017 (the "***Vesting Commencement Date***") and 1/48th of the Restricted Shares shall be released from the Repurchase Option on each monthly anniversary following the one (1) year anniversary of the Vesting Commencement Date such that all of the Restricted Shares shall be released from the Repurchase Option on the fourth (4th) year anniversary of the Vesting Commencement Date, subject to the Purchaser's continuous employment or service to the Company on each such vesting date.

Any of the Shares which, from time to time, have not yet been released from the Repurchase Option are referred to herein as "***Unreleased Shares***." The number of Shares released each month from the Repurchase Option shall be rounded down to the next whole number of Shares, except in the last month of the fourth (4th) year period when all Unreleased Shares shall be released from the Repurchase Option.

(b) Subject to Section 6, the Shares which have been released from the Repurchase Option shall be delivered to the Purchaser at the Purchaser's request.

4. Restriction on Transfer. Except for the escrow described below in Section 6, none of the Shares or any beneficial interest therein shall be transferred, encumbered or otherwise disposed of in any manner until the release of such Shares from the Repurchase Option in accordance with the provisions of this Agreement.

5. Marital Dissolution or Legal Separation.

(a) Notwithstanding anything in this Agreement to the contrary, in connection with the dissolution of the Purchaser's marriage or the legal separation of the Purchaser and the Purchaser's spouse, the Company shall have the right (the "***Special Purchase Right***"), if applicable, to purchase from the Purchaser's spouse, in accordance with the provisions of this Section 5, all or any portion of the Shares which would otherwise be awarded to such spouse in settlement of any community property or other marital property rights such spouse may have in such shares.

(b) The Purchaser shall promptly provide the Company with written notice (the "***Dissolution Notice***") of (i) the entry of any judicial decree or order resolving the property rights of the Purchaser and the Purchaser's spouse in connection with their marital dissolution or legal separation or (ii) the execution of any contract or agreement relating to the distribution or division of such property rights. The Dissolution Notice shall be accompanied by a copy of the actual decree or order of dissolution or contract or agreement between the Purchaser and the Purchaser's spouse which provides for the award to the spouse of one or more Shares in settlement of any community property or other marital property rights such spouse may have in such shares.

(c) The Special Purchase Right shall be exercisable by delivery of written notice (the "***Purchase Notice***") to the Purchaser and the Purchaser's spouse within forty-five (45) days after the Company's receipt of the Dissolution Notice. The Purchase Notice shall indicate the number of Shares to be purchased by the Company, the date such purchase is to be effected (such date to be not less than five (5) business days, nor more than fifteen (15) business days, after the date of the Purchase Notice) and the fair market value to be paid for such Shares. The Purchaser (or the Purchaser's spouse, to the extent such spouse has physical possession of the Shares) shall, prior to the close of business on the date specified for the purchase, deliver to the Company the certificates representing the shares to be purchased. The Company shall, concurrently with the receipt of the stock certificates, pay to the Purchaser's spouse (in cash or cash equivalents) an amount equal to the fair market value specified for such shares in the Purchase Notice.

(d) If the Purchaser's spouse does not agree with the fair market value specified for the Shares in the Purchase Notice, then the spouse shall promptly notify the Company in writing of such disagreement and the fair market value of such Shares shall thereupon be determined by an appraiser of recognized standing selected by the Company and the spouse. If they cannot agree on an appraiser within fifteen (15) days after the date of the Purchase Notice, each shall select an appraiser of recognized standing, and the two (2) appraisers shall designate a third appraiser of recognized standing whose appraisal shall be determinative of such value. The cost of the appraisal shall be shared equally by the Company and the Purchaser's spouse. The closing shall then be held on the fifteenth (15th) business day following the completion of such appraisal; provided, however, that if the appraised value is more than twenty-five percent (25%) greater than the fair market value specified for the Shares in the Purchase Notice, the Company shall have the right, exercisable prior to the expiration of such fifteen (15) business-day period, to rescind the exercise of the Special Purchase Right and thereby revoke its election to purchase the Shares awarded to the spouse.

(e) The Special Purchase Right shall lapse upon the earlier to occur of (i) the lapse of the Repurchase Option or (ii) the expiration of the exercise period specified in this Section 5, to the extent the Special Purchase Right is not timely exercised in accordance with such this Section 5.

6. Escrow of Shares. Pursuant to the terms of the Joint Escrow Instructions attached hereto as Exhibit A, the Shares issued under this Agreement shall be held by the Escrow Agent (as defined in such Joint Escrow Instructions) along with a stock assignment executed by the Purchaser in blank in the form attached hereto as Exhibit B. Notwithstanding the monthly vesting set forth in Section 4 above, neither the Company nor the Escrow Agent shall be required to release or issue certificates evidencing the Shares to the Purchaser more frequently than twice in any calendar year.

7. Investment Representations. In connection with the purchase of the Shares, the Purchaser represents to the Company the following:

(a) The Shares to be purchased by the Purchaser hereunder will be acquired for investment for the Purchaser's own account and not with a view to the public resale or distribution thereof within the meaning of the Securities Act of 1933, as amended (the "***Securities Act***").

(b) The Purchaser has received or has had full access to all the information the Purchaser considers necessary or appropriate to make an informed investment decision with respect to the Shares.

(c) The Purchaser understands that the purchase of the Shares involves substantial risk. The Purchaser: (i) has experience as an investor in securities of companies in the development stage and acknowledges that the Purchaser is able to fend for itself, can bear the economic risk of the Purchaser's investment in the Shares and has such knowledge and experience in financial or business matters that it is capable of evaluating the merits and risks of its investment in the Shares and protecting its investment; and/or (ii) has a preexisting business relationship with the Company and/or certain of its other officers, directors or controlling persons of a nature and duration that enables the Purchaser to be aware of the character, business acumen and financial circumstances of such persons.

(d) The Purchaser has not been solicited to offer to purchase or to purchase any Shares by means of any general solicitation or advertising within the meaning of Regulation D promulgated under the Securities Act ("***Regulation D***").

(e) The Purchaser is not a person of the type described in Section 506(d) of Regulation D that would disqualify the Company from engaging in a transaction pursuant to Section 506 of Regulation D.

(f) The Purchaser understands that the Shares are characterized as "restricted securities" under the Securities Act, in a transaction not involving a public offering and that under the Securities Act and applicable regulations thereunder such securities may be resold without registration under the Securities Act only in certain limited circumstances. The Purchaser represents that it is familiar with Rule 144 of the Securities and Exchange Commission and understands the resale limitations imposed thereby and by the Securities Act. The Purchaser understands that the Company is under no obligation to register any of the securities sold hereunder.

8. Stock Certificate Legends; Other Restrictions.

(a) The share certificate evidencing the Shares issued hereunder shall be endorsed with the following legends:

i. THE SHARES REPRESENTED BY THIS CERTIFICATE HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "ACT"), AND HAVE BEEN ACQUIRED FOR INVESTMENT AND NOT WITH A VIEW TO, OR IN CONNECTION WITH, THE SALE OR DISTRIBUTION THEREOF. NO SUCH SALE, TRANSFER OR DISTRIBUTION MAY BE EFFECTED WITHOUT AN EFFECTIVE REGISTRATION STATEMENT RELATED THERETO OR AN APPLICABLE EXEMPTION FROM THE REGISTRATION REQUIREMENTS UNDER THE ACT.

ii. THE SHARES REPRESENTED BY THIS CERTIFICATE ARE SUBJECT TO A RIGHT OF FIRST REFUSAL OPTION IN FAVOR OF THE CORPORATION AND/OR ITS ASSIGNEE(S), AS PROVIDED IN THE BYLAWS OF THE CORPORATION, A COPY OF WHICH ARE ON FILE WITH THE SECRETARY OF THE CORPORATION.

iii. Any legend required by any applicable state securities laws.

(b) The Purchaser further acknowledges that it is a condition to the issuance of the Shares to the Purchaser that the Purchaser agrees to be bound by the terms and conditions of, and become a party to, any stockholders', voting or similar agreements of the Company, as required by the terms of such agreements. The Purchaser hereby agrees to be so bound and to execute any additional documents as may be deemed necessary or advisable by the Company in order to effectuate the foregoing agreements.

9. Market Stand-Off Agreement. The Purchaser hereby agrees, if so requested by the managing underwriters or the Company in connection with the initial public offering of the Company's Common Stock, that, without the prior written consent of such managing underwriters, the Purchaser will not offer, sell, contract to sell, grant any option to purchase, make any short sale or otherwise dispose of, assign any legal or beneficial interest in or make a distribution of any capital stock of the Company held by or on behalf of the Purchaser or beneficially owned by the Purchaser in accordance with the rules and regulations of the Securities and Exchange Commission for a period of up to 180 days after the date of the final prospectus relating to the Company's initial public offering.

10. Adjustment for Stock Split. All references to the number of Shares and the purchase price of the Shares in this Agreement shall be appropriately adjusted to reflect any stock split, reverse stock split or stock dividend or other similar change in the Shares which may be made by the Company after the date of this Agreement.

11. Tax Consequences. The Purchaser has reviewed with the Purchaser's own tax advisors the federal, state, local and foreign tax consequences of this investment and the transactions contemplated by this Agreement. The Purchaser is relying solely on such advisors and not on any statements or representations of the Company or any of its agents. The Purchaser understands that the Purchaser (and not the Company) shall be responsible for the Purchaser's own tax liability that may arise as a result of this investment or the transactions contemplated by this Agreement. The Purchaser understands that Section 83 of the Internal Revenue Code of 1986, as amended (the "Code"), taxes as ordinary income both (i) the difference between the fair market value of the Shares when the Company granted the Purchaser the right to purchase the Shares and the fair market value of the Shares on the date of this Agreement, and (ii) the difference between the amount paid for the Shares and the fair market value of the Shares as of the date any restrictions on the Shares lapse. In this context, "restriction" includes the right of the Company to buy back the Shares pursuant to its repurchase option. In the event the Company has

registered under the Exchange Act, "restriction" with respect to officers, directors and 10% shareholders also means the period after the purchase of the Shares during which such officers, directors and 10% shareholders could be subject to suit under Section 16(b) of the Exchange Act. The Purchaser understands that the Purchaser may elect to be taxed at the time the Shares are purchased rather than when and as the Company's repurchase option or 16(b) period expires by filing an election under Section 83(b) of the Code with the I.R.S. within 30 days from the date of purchase.

THE PURCHASER ACKNOWLEDGES THAT IT IS THE PURCHASER'S SOLE RESPONSIBILITY AND NOT THE COMPANY'S TO TIMELY FILE THE ELECTION UNDER SECTION 83(b), EVEN IF THE PURCHASER REQUESTS THE COMPANY OR ITS REPRESENTATIVES TO MAKE THIS FILING ON THE PURCHASER'S BEHALF.

12. California Corporate Securities Law. THE SALE OF THE SECURITIES WHICH ARE THE SUBJECT OF THIS AGREEMENT HAS NOT BEEN QUALIFIED WITH THE COMMISSIONER OF CORPORATIONS OF THE STATE OF CALIFORNIA AND THE ISSUANCE OF SUCH SECURITIES OR THE PAYMENT OR RECEIPT OF ANY PART OF THE CONSIDERATION THEREFORE PRIOR TO SUCH QUALIFICATION IS UNLAWFUL, UNLESS THE SALE OF SECURITIES IS EXEMPT FROM THE QUALIFICATION BY SECTION 25100, 25102, OR 25105 OF THE CALIFORNIA CORPORATIONS CODE. THE RIGHTS OF ALL PARTIES TO THIS AGREEMENT ARE EXPRESSLY CONDITIONED UPON SUCH QUALIFICATION BEING OBTAINED, UNLESS THE SALE IS SO EXEMPT.

13. General Provisions.

(a) This Agreement shall be governed by the laws of the State of California. This Agreement represents the entire agreement between the parties with respect to the purchase of Common Stock by the Purchaser and may only be modified or amended in writing signed by both parties.

(b) Any notice, demand or request required or permitted to be given by either the Company or the Purchaser pursuant to the terms of this Agreement shall be in writing and shall be deemed given when delivered personally or deposited in the U.S. mail, First Class with postage prepaid, and addressed to the parties at the addresses of the parties set forth at the end of this Agreement or such other address as a party may request by notifying the other in writing.

(c) The rights and benefits of the Company under this Agreement shall be transferable to any one or more persons or entities, and all covenants and agreements hereunder shall inure to the benefit of, and be enforceable by the Company's successors and assigns. The rights and obligations of the Purchaser under this Agreement may only be assigned with the prior written consent of the Company and any purported transfer otherwise shall be null and void.

(d) Either party's failure to enforce any provision or provisions of this Agreement shall not in any way be construed as a waiver of any such provision or provisions, nor prevent that party thereafter from enforcing each and every other provision of this Agreement. The rights granted both parties herein are cumulative and shall not constitute a waiver of either party's right to assert all other legal remedies available to it under the circumstances.

(e) The Purchaser agrees upon request to execute any further documents or instruments necessary or desirable to carry out the purposes or intent of this Agreement.

(f) THE PURCHASER ACKNOWLEDGES AND AGREES THAT THE LAPSING OF THE REPURCHASE OPTION PURSUANT TO SECTION 3 HEREOF IS EARNED ONLY BY THE CONTINUING SERVICE OF THE PURCHASER TO THE COMPANY (AND NOT THROUGH THE ACT OF BEING HIRED OR PURCHASING SHARES HEREUNDER). THE PURCHASER FURTHER ACKNOWLEDGES AND AGREES THAT THIS AGREEMENT, THE TRANSACTIONS CONTEMPLATED HEREUNDER AND THE REPURCHASE OPTION SCHEDULE SET FORTH HEREIN DO NOT CONSTITUTE AN EXPRESS OR IMPLIED PROMISE OF CONTINUED ENGAGEMENT OF THE PURCHASER AS A SERVICE PROVIDER FOR SUCH PERIOD, FOR ANY PERIOD, OR AT ALL, AND SHALL NOT INTERFERE WITH THE COMPANY'S RIGHT TO TERMINATE THE PURCHASER'S SERVICE TO THE COMPANY AT ANY TIME, WITH OR WITHOUT CAUSE.

(g) The Purchaser has reviewed this Agreement in its entirety, has had an opportunity to obtain the advice of counsel prior to executing this Agreement and fully understands all provisions of this Agreement.

[Remainder of page intentionally left blank]

IN WITNESS WHEREOF, the parties have duly executed this Agreement as of the date first set forth above.

COMPANY:

ONCTERNAL THERAPEUTICS, INC.,
a Delaware Corporation

By: /s/ James B. Breitmeyer
Name: James B. Breitmeyer, M.D., Ph.D.
Title: Chief Executive Officer

Address: 3525 Del Mar Heights Rd., #821
San Diego, CA 92130

PURCHASER:

RICHARD G. VINCENT

/s/ Richard Vincent

Address: 4732 Finchley Terrace
San Diego, CA 92130

CONSENT OF SPOUSE

I, Stacy K. Vincent, spouse of Richard G. Vincent, have read and approve the foregoing Agreement. In consideration of granting of the right to my spouse to purchase shares of Oncternal Therapeutics, Inc. as set forth in the Agreement, I hereby appoint my spouse as my attorney-in-fact in respect to the exercise of any rights under the Agreement and agree to be bound by the provisions of the Agreement insofar as I may have any rights in said Agreement or any shares issued pursuant thereto under the community property laws of the State of California or similar laws relating to marital property in effect in the state of our residence as of the date of the signing of the foregoing Agreement.

Dated: December 14, 2017

/s/ Stacy K. Vincent
Signature

EXHIBIT A

JOINT ESCROW INSTRUCTIONS

December 14, 2017

Oncternal Therapeutics, Inc.
Attention: Secretary

Ladies and Gentlemen:

As escrow agent (the "***Escrow Agent***") for both Oncternal Therapeutics, Inc., a Delaware corporation (the "***Company***"), and the undersigned purchaser of stock of the Company (the "***Purchaser***"), you are hereby authorized and directed to hold the documents delivered to you pursuant to the terms of that certain Restricted Stock Purchase Agreement ("***Agreement***") between the Company and the undersigned (the "***Escrow***"), in accordance with the following instructions:

1. In the event the Company and/or any assignee of the Company (referred to collectively for convenience herein as the "***Company***") exercises the Company's Repurchase Option as defined in the Agreement), the Company shall give to the Purchaser and you a written notice specifying the number of shares of stock to be purchased, the purchase price and the time for a closing hereunder at the principal office of the Company. The Purchaser and the Company hereby irrevocably authorize and direct you to close the transaction contemplated by such notice in accordance with the terms of said notice.

2. At the closing, you are directed (a) to date the stock assignments necessary for the transfer in question, (b) to fill in the number of shares being transferred, and (c) to deliver same, together with the certificate evidencing the shares of stock to be transferred, to the Company or its assignee, against the simultaneous delivery to you of the purchase price (by cash, a check, cancellation of indebtedness or some combination thereof) for the number of shares of stock being purchased pursuant to the exercise of the Company's repurchase option.

3. The Purchaser irrevocably authorizes the Company to deposit with you any certificates evidencing shares of stock to be held by you hereunder and any additions and substitutions to said shares as defined in the Agreement. The Purchaser does hereby irrevocably constitute and appoint you as the Purchaser's attorney-in-fact and agent for the term of this Escrow to execute with respect to such securities all documents necessary or appropriate to make such securities negotiable and to complete any transaction herein contemplated, including but not limited to the filing with any applicable state blue sky authority of any required applications for consent to, or notice of transfer of, the securities. Subject to the provisions of the Agreement and of this Escrow Agreement, the Purchaser shall exercise all rights and privileges of a shareholder of the Company while the stock is held by you.

4. Upon written request of the Purchaser, but no more than twice per calendar year, unless the Company's repurchase option has been exercised, you will deliver to the Purchaser a certificate or certificates representing so many shares of stock as are not then subject to the Company's repurchase option. Within 90 days after cessation of the Purchaser's continuous employment by and/or service to the Company, or any parent or subsidiary of the Company, you will deliver to the Purchaser a certificate or certificates representing the aggregate number of shares held or issued pursuant to the Agreement and not purchased by the Company or its assignees pursuant to exercise of the Company's repurchase option.

5. If at the time of termination of this escrow you should have in your possession any documents, securities or other property belonging to the Purchaser, you shall deliver all of the same to the Purchaser and shall be discharged of all further obligations hereunder.

6. Your duties hereunder may be altered, amended, modified or revoked only by a writing signed by all of the parties hereto.

7. You shall be obligated only for the performance of such duties as are specifically set forth herein and may rely and shall be protected in relying or refraining from acting on any instrument reasonably believed by you to be genuine and to have been signed or presented by the proper party or parties. You shall not be personally liable for any act you may do or omit to do hereunder as Escrow Agent or as attorney-in-fact for the Purchaser while acting in good faith, and any act done or omitted by you pursuant to the advice of your own attorneys shall be conclusive evidence of such good faith.

8. You are hereby expressly authorized to disregard any and all warnings given by any of the parties hereto or by any other person or corporation, excepting only orders or process of courts of law and are hereby expressly authorized to comply with and obey orders, judgments or decrees of any court. In case you obey or comply with any such order, judgment or decree, you shall not be liable to any of the parties hereto or to any other person, firm or corporation by reason of such compliance, notwithstanding any such order, judgment or decree being subsequently reversed, modified, annulled, set aside, vacated or found to have been entered without jurisdiction.

9. You shall not be liable in any respect on account of the identity, authorities or rights of the parties executing or delivering or purporting to execute or deliver the Agreement or any documents or papers deposited or called for hereunder.

10. You shall not be liable for the outlawing of any rights under the statute of limitations with respect to these Joint Escrow Instructions or any documents deposited with you.

11. You shall be entitled to employ such legal counsel and other experts as you may deem necessary properly to advise you in connection with your obligations hereunder, may rely upon the advice of such counsel, and may pay such counsel reasonable compensation therefor.

12. Your responsibilities as Escrow Agent hereunder shall terminate if you shall cease to be an officer or agent of the Company or if you shall resign by written notice to each party. In the event of any such termination, the Company shall appoint a successor Escrow Agent.

13. If you reasonably require other or further instruments in connection with these Joint Escrow Instructions or obligations in respect hereto, the necessary parties hereto shall join in furnishing such instruments.

14. It is understood and agreed that should any dispute arise with respect to the delivery and/or ownership or right of possession of the securities held by you hereunder, you are authorized and directed to retain in your possession without liability to anyone all or any part of said securities until such disputes shall have been settled either by mutual written agreement of the parties concerned or by a final order, decree or judgment of a court of competent jurisdiction after the time for appeal has expired and no appeal has been perfected, but you shall be under no duty whatsoever to institute or defend any such proceedings.

15. Any notice required or permitted hereunder shall be given in writing and shall be deemed effectively given upon personal delivery or upon deposit in the United States Post Office, by registered or certified mail with postage and fees prepaid, addressed to each of the other parties thereunto entitled at the following addresses or at such other addresses as a party may designate by ten days' advance written notice to each of the other parties hereto.

COMPANY:	Oncternal Therapeutics, Inc. 3525 Del Mar Heights Rd., #821 San Diego, CA 92130 Attention: Secretary
PURCHASER	At the address listed after his or her signature.
ESCROW AGENT:	Oncternal Therapeutics, Inc. 3525 Del Mar Heights Rd., #821 San Diego, CA 92130 Attention: Secretary

16. By signing these Joint Escrow Instructions, you become a party hereto only for the purpose of said Joint Escrow Instructions; you do not become a party to the Agreement.

17. This instrument shall be binding upon and inure to the benefit of the parties hereto, and their respective successors and permitted assigns.

18. These Joint Escrow Instructions shall be governed by, and construed and enforced in accordance with, the laws of the State of California.

Very truly yours,

ONCTERNAL THERAPEUTICS, INC.

By: /s/ James B. Breitmeyer
Name: James B. Breitmeyer, M.D., Ph.D.
Title: Chief Executive Officer

PURCHASER:

RICHARD G. VINCENT

/s/ Richard G. Vincent
Address: 4732 Finchley Terrace
San Diego, CA 92130

ESCROW AGENT:

ONCTERNAL THERAPEUTICS, INC.

By: /s/ Richard G. Vincent
Name: Richard G. Vincent
Title: Secretary

EXHIBIT B

ASSIGNMENT SEPARATE FROM CERTIFICATE

FOR VALUE RECEIVED I, the undersigned, hereby sell, assign and transfer unto _____, _____ shares of the Common Stock of Oncternal Therapeutics, Inc. standing in my name of the books of said corporation represented by Certificate No. _____ herewith and do hereby irrevocably constitute and appoint Oncternal Therapeutics, Inc., to transfer the said stock on the books of the within named corporation with full power of substitution in the premises.

This Assignment Separate from Certificate may be used only in accordance with the Restricted Stock Purchase Agreement between Oncternal Therapeutics, Inc. and the undersigned dated as of December 14, 2017.

Dated: _____, 201_

RICHARD G. VINCENT

By: /s/ Richard G. Vincent

INSTRUCTIONS: Please do not fill in the blanks other than the signature line. The purpose of this assignment is to enable the Company to exercise its "Repurchase Option," as set forth in the Agreement, without requiring additional signatures on the part of the Purchaser.

ELECTION UNDER INTERNAL REVENUE CODE SECTION 83(B)

The undersigned taxpayer hereby elects, pursuant to Section 83(b) of the Internal Revenue Code of 1986, as amended, to include in taxpayer's gross income for the current taxable year the amount of any compensation taxable to taxpayer in connection with taxpayer's receipt of shares (the "Shares") of Common Stock of Oncternal Therapeutics, Inc., a Delaware corporation (the "Company").

1. The name, address and taxpayer identification number of the undersigned taxpayer are:

RICHARD VINCENT
4732 Finchley Terrace
San Diego, CA 92130

SSN: ____-____-____

The name, address and taxpayer identification number of the Taxpayer's spouse are (complete if applicable):

_____
_____
_____

SSN: ____-____-____

Description of the property with respect to which the election is being made:

155,897 shares of Common Stock of the Company.

2. The date on which the property was transferred was December __, 2017. The taxable year to which this election relates is calendar year 2017.

3. Nature of restrictions to which the property is subject:

The Shares are subject to repurchase at their original purchase price if unvested as of the date of termination of employment, directorship or consultancy with the Company.

4. The fair market value at the time of transfer (determined without regard to any lapse restrictions, as defined in Treasury Regulation Section 1.83-3(a)) of the Shares was $0.05 per share.

5. The amount paid by the taxpayer for Shares was $0.00 per share.

6. A copy of this statement has been furnished to the Company.

Dated: _____ Taxpayer Signature _____

The undersigned spouse of Taxpayer joins in this election. (Complete if applicable).

Dated: _____ Spouse's Signature _____

ONCTERNAL THERAPEUTICS, INC.

RESTRICTED STOCK PURCHASE AGREEMENT

THIS RESTRICTED STOCK PURCHASE AGREEMENT ("***Agreement***") is made as of December 14, 2017, by and between **ONCTERNAL THERAPEUTICS, INC.**, a Delaware corporation (the "***Company***") and William R. LaRue (the "***Purchaser***").

The parties agree as follows:

1. Issuance of Stock. The Company hereby agrees to issue to the Purchaser an aggregate of Two Hundred Twenty Thousand (220,000) shares of the Company's Common Stock (par value $0.0001 per share) (the "***Shares***"), in consideration of past or future services to the Company by the Purchaser.

2. Repurchase Option. In the event of any voluntary or involuntary termination of the services of the Purchaser to the Company for any or no reason before all of the Shares are released from the Company's Repurchase Option (as defined below), the Company shall, upon the date of such termination (as reasonably fixed and determined by the Company), have an irrevocable, exclusive option, but not the obligation, for a period of ninety (90) days from such date to repurchase all or any portion of the Unreleased Shares (as defined below in Section 3) at such time (the "***Repurchase Option***") at a purchase price of $0.0001 per share (the "***Repurchase Price***"). The Repurchase Option shall be exercisable by the Company by written notice to the Purchaser or the Purchaser's executor and shall be exercisable by delivery to the Purchaser or the Purchaser's executor of cash, check or wire transfer in an amount equal to the Repurchase Price times the number of Shares to be repurchased (the "***Aggregate Repurchase Price***"). Upon delivery of such notice and the payment of the Aggregate Repurchase Price, the Company shall become the legal and beneficial owner of the Shares being repurchased and all rights and interests therein or relating thereto, and the Company shall have the right to retain and transfer to its own name the number of Shares being repurchased by the Company. The Repurchase Option set forth in this Section 2 may be assigned by the Company in whole or in part in its sole and unfettered discretion.

3. Release of Shares From Repurchase Option.

(a) The Shares shall be released from the Company's Repurchase Option pursuant to the following schedule:

100% of the Shares (the "***Restricted Shares***") shall be subject to the Repurchase Option. 1/4th of the Restricted Shares shall be released from the Repurchase Option on the one (1) year anniversary of December 14, 2017 (the "***Vesting Commencement Date***") and 1/48th of the Restricted Shares shall be released from the Repurchase Option on each monthly anniversary following the one (1) year anniversary of the Vesting Commencement Date such that all of the Restricted Shares shall be released from the Repurchase Option on the fourth (4th) year anniversary of the Vesting Commencement Date, subject to the Purchaser's continuous employment or service to the Company on each such vesting date.

Any of the Shares which, from time to time, have not yet been released from the Repurchase Option are referred to herein as "***Unreleased Shares***." The number of Shares released each month from the Repurchase Option shall be rounded down to the next whole number of Shares, except in the last month of the fourth (4th) year period when all Unreleased Shares shall be released from the Repurchase Option.

(b) Subject to Section 6, the Shares which have been released from the Repurchase Option shall be delivered to the Purchaser at the Purchaser's request.

4. Restriction on Transfer. Except for the escrow described below in Section 6, none of the Shares or any beneficial interest therein shall be transferred, encumbered or otherwise disposed of in any manner until the release of such Shares from the Repurchase Option in accordance with the provisions of this Agreement.

5. Marital Dissolution or Legal Separation.

(a) Notwithstanding anything in this Agreement to the contrary, in connection with the dissolution of the Purchaser's marriage or the legal separation of the Purchaser and the Purchaser's spouse, the Company shall have the right (the "***Special Purchase Right***"), if applicable, to purchase from the Purchaser's spouse, in accordance with the provisions of this Section 5, all or any portion of the Shares which would otherwise be awarded to such spouse in settlement of any community property or other marital property rights such spouse may have in such shares.

(b) The Purchaser shall promptly provide the Company with written notice (the "***Dissolution Notice***") of (i) the entry of any judicial decree or order resolving the property rights of the Purchaser and the Purchaser's spouse in connection with their marital dissolution or legal separation or (ii) the execution of any contract or agreement relating to the distribution or division of such property rights. The Dissolution Notice shall be accompanied by a copy of the actual decree or order of dissolution or contract or agreement between the Purchaser and the Purchaser's spouse which provides for the award to the spouse of one or more Shares in settlement of any community property or other marital property rights such spouse may have in such shares.

(c) The Special Purchase Right shall be exercisable by delivery of written notice (the "***Purchase Notice***") to the Purchaser and the Purchaser's spouse within forty-five (45) days after the Company's receipt of the Dissolution Notice. The Purchase Notice shall indicate the number of Shares to be purchased by the Company, the date such purchase is to be effected (such date to be not less than five (5) business days, nor more than fifteen (15) business days, after the date of the Purchase Notice) and the fair market value to be paid for such Shares. The Purchaser (or the Purchaser's spouse, to the extent such spouse has physical possession of the Shares) shall, prior to the close of business on the date specified for the purchase, deliver to the Company the certificates representing the shares to be purchased. The Company shall, concurrently with the receipt of the stock certificates, pay to the Purchaser's spouse (in cash or cash equivalents) an amount equal to the fair market value specified for such shares in the Purchase Notice.

(d) If the Purchaser's spouse does not agree with the fair market value specified for the Shares in the Purchase Notice, then the spouse shall promptly notify the Company in writing of such disagreement and the fair market value of such Shares shall thereupon be determined by an appraiser of recognized standing selected by the Company and the spouse. If they cannot agree on an appraiser within fifteen (15) days after the date of the Purchase Notice, each shall select an appraiser of recognized standing, and the two (2) appraisers shall designate a third appraiser of recognized standing whose appraisal shall be determinative of such value. The cost of the appraisal shall be shared equally by the Company and the Purchaser's spouse. The closing shall then be held on the fifteenth (15th) business day following the completion of such appraisal; provided, however, that if the appraised value is more than twenty-five percent (25%) greater than the fair market value specified for the Shares in the Purchase Notice, the Company shall have the right, exercisable prior to the expiration of such fifteen (15) business-day period, to rescind the exercise of the Special Purchase Right and thereby revoke its election to purchase the Shares awarded to the spouse.

(e) The Special Purchase Right shall lapse upon the earlier to occur of (i) the lapse of the Repurchase Option or (ii) the expiration of the exercise period specified in this Section 5, to the extent the Special Purchase Right is not timely exercised in accordance with such this Section 5.

6. Escrow of Shares. Pursuant to the terms of the Joint Escrow Instructions attached hereto as Exhibit A, the Shares issued under this Agreement shall be held by the Escrow Agent (as defined in such Joint Escrow Instructions) along with a stock assignment executed by the Purchaser in blank in the form attached hereto as Exhibit B. Notwithstanding the monthly vesting set forth in Section 3 above, neither the Company nor the Escrow Agent shall be required to release or issue certificates evidencing the Shares to the Purchaser more frequently than twice in any calendar year.

7. Investment Representations. In connection with the purchase of the Shares, the Purchaser represents to the Company the following:

(a) The Shares to be purchased by the Purchaser hereunder will be acquired for investment for the Purchaser's own account and not with a view to the public resale or distribution thereof within the meaning of the Securities Act of 1933, as amended (the "***Securities Act***").

(b) The Purchaser has received or has had full access to all the information the Purchaser considers necessary or appropriate to make an informed investment decision with respect to the Shares.

(c) The Purchaser understands that the purchase of the Shares involves substantial risk. The Purchaser: (i) has experience as an investor in securities of companies in the development stage and acknowledges that the Purchaser is able to fend for itself, can bear the economic risk of the Purchaser's investment in the Shares and has such knowledge and experience in financial or business matters that it is capable of evaluating the merits and risks of its investment in the Shares and protecting its investment; and/or (ii) has a preexisting business relationship with the Company and/or certain of its other officers, directors or controlling persons of a nature and duration that enables the Purchaser to be aware of the character, business acumen and financial circumstances of such persons.

(d) The Purchaser has not been solicited to offer to purchase or to purchase any Shares by means of any general solicitation or advertising within the meaning of Regulation D promulgated under the Securities Act ("***Regulation D***").

(e) The Purchaser is not a person of the type described in Section 506(d) of Regulation D that would disqualify the Company from engaging in a transaction pursuant to Section 506 of Regulation D.

(f) The Purchaser understands that the Shares are characterized as "restricted securities" under the Securities Act, in a transaction not involving a public offering and that under the Securities Act and applicable regulations thereunder such securities may be resold without registration under the Securities Act only in certain limited circumstances. The Purchaser represents that it is familiar with Rule 144 of the Securities and Exchange Commission and understands the resale limitations imposed thereby and by the Securities Act. The Purchaser understands that the Company is under no obligation to register any of the securities sold hereunder.

8. Stock Certificate Legends; Other Restrictions.

(a) The share certificate evidencing the Shares issued hereunder shall be endorsed with the following legends:

i. THE SHARES REPRESENTED BY THIS CERTIFICATE HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "ACT"), AND HAVE BEEN ACQUIRED FOR INVESTMENT AND NOT WITH A VIEW TO, OR IN CONNECTION WITH, THE SALE OR DISTRIBUTION THEREOF. NO SUCH SALE, TRANSFER OR DISTRIBUTION MAY BE EFFECTED WITHOUT AN EFFECTIVE REGISTRATION STATEMENT RELATED THERETO OR AN APPLICABLE EXEMPTION FROM THE REGISTRATION REQUIREMENTS UNDER THE ACT.

ii. THE SHARES REPRESENTED BY THIS CERTIFICATE ARE SUBJECT TO A RIGHT OF FIRST REFUSAL OPTION IN FAVOR OF THE CORPORATION AND/OR ITS ASSIGNEE(S), AS PROVIDED IN THE BYLAWS OF THE CORPORATION, A COPY OF WHICH ARE ON FILE WITH THE SECRETARY OF THE CORPORATION.

iii. Any legend required by any applicable state securities laws.

(b) The Purchaser further acknowledges that it is a condition to the issuance of the Shares to the Purchaser that the Purchaser agrees to be bound by the terms and conditions of, and become a party to, any stockholders', voting or similar agreements of the Company, as required by the terms of such agreements. The Purchaser hereby agrees to be so bound and to execute any additional documents as may be deemed necessary or advisable by the Company in order to effectuate the foregoing agreements.

9. Market Stand-Off Agreement. The Purchaser hereby agrees, if so requested by the managing underwriters or the Company in connection with the initial public offering of the Company's Common Stock, that, without the prior written consent of such managing underwriters, the Purchaser will not offer, sell, contract to sell, grant any option to purchase, make any short sale or otherwise dispose of, assign any legal or beneficial interest in or make a distribution of any capital stock of the Company held by or on behalf of the Purchaser or beneficially owned by the Purchaser in accordance with the rules and regulations of the Securities and Exchange Commission for a period of up to 180 days after the date of the final prospectus relating to the Company's initial public offering.

10. Adjustment for Stock Split. All references to the number of Shares and the purchase price of the Shares in this Agreement shall be appropriately adjusted to reflect any stock split, reverse stock split or stock dividend or other similar change in the Shares which may be made by the Company after the date of this Agreement.

11. Tax Consequences. The Purchaser has reviewed with the Purchaser's own tax advisors the federal, state, local and foreign tax consequences of this investment and the transactions contemplated by this Agreement. The Purchaser is relying solely on such advisors and not on any statements or representations of the Company or any of its agents. The Purchaser understands that the Purchaser (and not the Company) shall be responsible for the Purchaser's own tax liability that may arise as a result of this investment or the transactions contemplated by this Agreement. The Purchaser understands that Section 83 of the Internal Revenue Code of 1986, as amended (the "Code"), taxes as ordinary income both (i) the difference between the fair market value of the Shares when the Company granted the Purchaser the right to purchase the Shares and the fair market value of the Shares on the date of this Agreement, and (ii) the difference between the amount paid for the Shares and the fair market value of the Shares as of the date any restrictions on the Shares lapse. In this context, "restriction" includes the right of the Company to buy back the Shares pursuant to its repurchase option. In the event the Company has registered under the Exchange Act, "restriction" with respect to officers, directors and 10% shareholders also means the period after the purchase of the Shares during which such officers, directors and 10% shareholders could be subject to suit under Section 16(b) of the Exchange Act. The Purchaser understands that the Purchaser may elect to be taxed at the time the Shares are purchased rather than when and as the Company's repurchase option or 16(b) period expires by filing an election under Section 83(b) of the Code with the I.R.S. within 30 days from the date of purchase.

THE PURCHASER ACKNOWLEDGES THAT IT IS THE PURCHASER'S SOLE RESPONSIBILITY AND NOT THE COMPANY'S TO TIMELY FILE THE ELECTION UNDER SECTION 83(b), EVEN IF THE PURCHASER REQUESTS THE COMPANY OR ITS REPRESENTATIVES TO MAKE THIS FILING ON THE PURCHASER'S BEHALF.

12. California Corporate Securities Law. THE SALE OF THE SECURITIES WHICH ARE THE SUBJECT OF THIS AGREEMENT HAS NOT BEEN QUALIFIED WITH THE COMMISSIONER OF CORPORATIONS OF THE STATE OF CALIFORNIA AND THE ISSUANCE OF SUCH SECURITIES OR THE PAYMENT OR RECEIPT OF ANY PART OF THE CONSIDERATION THEREFORE PRIOR TO SUCH QUALIFICATION IS UNLAWFUL, UNLESS THE SALE OF SECURITIES IS EXEMPT FROM THE QUALIFICATION BY SECTION 25100, 25102, OR 25105 OF THE CALIFORNIA CORPORATIONS CODE. THE RIGHTS OF ALL PARTIES TO THIS AGREEMENT ARE EXPRESSLY CONDITIONED UPON SUCH QUALIFICATION BEING OBTAINED, UNLESS THE SALE IS SO EXEMPT.

13. General Provisions.

(a) This Agreement shall be governed by the laws of the State of California. This Agreement represents the entire agreement between the parties with respect to the purchase of Common Stock by the Purchaser and may only be modified or amended in writing signed by both parties.

(b) Any notice, demand or request required or permitted to be given by either the Company or the Purchaser pursuant to the terms of this Agreement shall be in writing and shall be deemed given when delivered personally or deposited in the U.S. mail, First Class with postage prepaid, and addressed to the parties at the addresses of the parties set forth at the end of this Agreement or such other address as a party may request by notifying the other in writing.

(c) The rights and benefits of the Company under this Agreement shall be transferable to any one or more persons or entities, and all covenants and agreements hereunder shall inure to the benefit of, and be enforceable by the Company's successors and assigns. The rights and obligations of the Purchaser under this Agreement may only be assigned with the prior written consent of the Company and any purported transfer otherwise shall be null and void.

(d) Either party's failure to enforce any provision or provisions of this Agreement shall not in any way be construed as a waiver of any such provision or provisions, nor prevent that party thereafter from enforcing each and every other provision of this Agreement. The rights granted both parties herein are cumulative and shall not constitute a waiver of either party's right to assert all other legal remedies available to it under the circumstances.

(e) The Purchaser agrees upon request to execute any further documents or instruments necessary or desirable to carry out the purposes or intent of this Agreement.

(f) THE PURCHASER ACKNOWLEDGES AND AGREES THAT THE LAPSING OF THE REPURCHASE OPTION PURSUANT TO SECTION 3 HEREOF IS EARNED ONLY BY THE CONTINUING SERVICE OF THE PURCHASER TO THE COMPANY (AND NOT THROUGH THE ACT OF BEING HIRED OR PURCHASING SHARES HEREUNDER). THE PURCHASER FURTHER ACKNOWLEDGES AND AGREES THAT THIS AGREEMENT, THE TRANSACTIONS CONTEMPLATED HEREUNDER AND THE REPURCHASE OPTION

SCHEDULE SET FORTH HEREIN DO NOT CONSTITUTE AN EXPRESS OR IMPLIED PROMISE OF CONTINUED ENGAGEMENT OF THE PURCHASER AS A SERVICE PROVIDER FOR SUCH PERIOD, FOR ANY PERIOD, OR AT ALL, AND SHALL NOT INTERFERE WITH THE COMPANY'S RIGHT TO TERMINATE THE PURCHASER'S SERVICE TO THE COMPANY AT ANY TIME, WITH OR WITHOUT CAUSE.

(g) The Purchaser has reviewed this Agreement in its entirety, has had an opportunity to obtain the advice of counsel prior to executing this Agreement and fully understands all provisions of this Agreement.

[Remainder of page intentionally left blank]

IN WITNESS WHEREOF, the parties have duly executed this Agreement as of the date first set forth above.

COMPANY:

ONCTERNAL THERAPEUTICS, INC.,
a Delaware Corporation

By: /s/ James B. Breitmeyer
Name: James B. Breitmeyer, M.D., Ph.D.
Title: Chief Executive Officer

Address: 3525 Del Mar Heights Rd., #821
San Diego, CA 92130

PURCHASER:

WILLIAM R. LARUE

/s/ William R. LaRue

Address: 5535 Corum Court
San Diego, CA 92130

CONSENT OF SPOUSE

I, _____, spouse of William R. LaRue, have read and approve the foregoing Agreement. In consideration of granting of the right to my spouse to purchase shares of Oncternal Therapeutics, Inc. as set forth in the Agreement, I hereby appoint my spouse as my attorney-in-fact in respect to the exercise of any rights under the Agreement and agree to be bound by the provisions of the Agreement insofar as I may have any rights in said Agreement or any shares issued pursuant thereto under the community property laws of the State of California or similar laws relating to marital property in effect in the state of our residence as of the date of the signing of the foregoing Agreement.

Dated: December ____, 2017

_____

Signature

EXHIBIT A

JOINT ESCROW INSTRUCTIONS

December 14, 2017

Oncternal Therapeutics, Inc.
Attention: Secretary

Ladies and Gentlemen:

As escrow agent (the "***Escrow Agent***") for both Oncternal Therapeutics, Inc., a Delaware corporation (the "***Company***"), and the undersigned purchaser of stock of the Company (the "***Purchaser***"), you are hereby authorized and directed to hold the documents delivered to you pursuant to the terms of that certain Restricted Stock Purchase Agreement ("***Agreement***") between the Company and the undersigned (the "***Escrow***"), in accordance with the following instructions:

1. In the event the Company and/or any assignee of the Company (referred to collectively for convenience herein as the "***Company***") exercises the Company's Repurchase Option as defined in the Agreement), the Company shall give to the Purchaser and you a written notice specifying the number of shares of stock to be purchased, the purchase price and the time for a closing hereunder at the principal office of the Company. The Purchaser and the Company hereby irrevocably authorize and direct you to close the transaction contemplated by such notice in accordance with the terms of said notice.

2. At the closing, you are directed (a) to date the stock assignments necessary for the transfer in question, (b) to fill in the number of shares being transferred, and (c) to deliver same, together with the certificate evidencing the shares of stock to be transferred, to the Company or its assignee, against the simultaneous delivery to you of the purchase price (by cash, a check, cancellation of indebtedness or some combination thereof) for the number of shares of stock being purchased pursuant to the exercise of the Company's repurchase option.

3. The Purchaser irrevocably authorizes the Company to deposit with you any certificates evidencing shares of stock to be held by you hereunder and any additions and substitutions to said shares as defined in the Agreement. The Purchaser does hereby irrevocably constitute and appoint you as the Purchaser's attorney-in-fact and agent for the term of this Escrow to execute with respect to such securities all documents necessary or appropriate to make such securities negotiable and to complete any transaction herein contemplated, including but not limited to the filing with any applicable state blue sky authority of any required applications for consent to, or notice of transfer of, the securities. Subject to the provisions of the Agreement and of this Escrow Agreement, the Purchaser shall exercise all rights and privileges of a shareholder of the Company while the stock is held by you.

4. Upon written request of the Purchaser, but no more than twice per calendar year, unless the Company's repurchase option has been exercised, you will deliver to the Purchaser a certificate or certificates representing so many shares of stock as are not then subject to the Company's repurchase option. Within 90 days after cessation of the Purchaser's continuous employment by and/or service to the Company, or any parent or subsidiary of the Company, you will deliver to the Purchaser a certificate or certificates representing the aggregate number of shares held or issued pursuant to the Agreement and not purchased by the Company or its assignees pursuant to exercise of the Company's repurchase option.

5. If at the time of termination of this escrow you should have in your possession any documents, securities or other property belonging to the Purchaser, you shall deliver all of the same to the Purchaser and shall be discharged of all further obligations hereunder.

6. Your duties hereunder may be altered, amended, modified or revoked only by a writing signed by all of the parties hereto.

7. You shall be obligated only for the performance of such duties as are specifically set forth herein and may rely and shall be protected in relying or refraining from acting on any instrument reasonably believed by you to be genuine and to have been signed or presented by the proper party or parties. You shall not be personally liable for any act you may do or omit to do hereunder as Escrow Agent or as attorney-in-fact for the Purchaser while acting in good faith, and any act done or omitted by you pursuant to the advice of your own attorneys shall be conclusive evidence of such good faith.

8. You are hereby expressly authorized to disregard any and all warnings given by any of the parties hereto or by any other person or corporation, excepting only orders or process of courts of law and are hereby expressly authorized to comply with and obey orders, judgments or decrees of any court. In case you obey or comply with any such order, judgment or decree, you shall not be liable to any of the parties hereto or to any other person, firm or corporation by reason of such compliance, notwithstanding any such order, judgment or decree being subsequently reversed, modified, annulled, set aside, vacated or found to have been entered without jurisdiction.

9. You shall not be liable in any respect on account of the identity, authorities or rights of the parties executing or delivering or purporting to execute or deliver the Agreement or any documents or papers deposited or called for hereunder.

10. You shall not be liable for the outlawing of any rights under the statute of limitations with respect to these Joint Escrow Instructions or any documents deposited with you.

11. You shall be entitled to employ such legal counsel and other experts as you may deem necessary properly to advise you in connection with your obligations hereunder, may rely upon the advice of such counsel, and may pay such counsel reasonable compensation therefor.

12. Your responsibilities as Escrow Agent hereunder shall terminate if you shall cease to be an officer or agent of the Company or if you shall resign by written notice to each party. In the event of any such termination, the Company shall appoint a successor Escrow Agent.

13. If you reasonably require other or further instruments in connection with these Joint Escrow Instructions or obligations in respect hereto, the necessary parties hereto shall join in furnishing such instruments.

14. It is understood and agreed that should any dispute arise with respect to the delivery and/or ownership or right of possession of the securities held by you hereunder, you are authorized and directed to retain in your possession without liability to anyone all or any part of said securities until such disputes shall have been settled either by mutual written agreement of the parties concerned or by a final order, decree or judgment of a court of competent jurisdiction after the time for appeal has expired and no appeal has been perfected, but you shall be under no duty whatsoever to institute or defend any such proceedings.

15. Any notice required or permitted hereunder shall be given in writing and shall be deemed effectively given upon personal delivery or upon deposit in the United States Post Office, by registered or certified mail with postage and fees prepaid, addressed to each of the other parties thereunto entitled at the following addresses or at such other addresses as a party may designate by ten days' advance written notice to each of the other parties hereto.

COMPANY:	Oncternal Therapeutics, Inc. 3525 Del Mar Heights Rd., #821 San Diego, CA 92130 Attention: Secretary
PURCHASER	At the address listed after his or her signature.
ESCROW AGENT:	Oncternal Therapeutics, Inc. 3525 Del Mar Heights Rd., #821 San Diego, CA 92130 Attention: Secretary

16. By signing these Joint Escrow Instructions, you become a party hereto only for the purpose of said Joint Escrow Instructions; you do not become a party to the Agreement.

17. This instrument shall be binding upon and inure to the benefit of the parties hereto, and their respective successors and permitted assigns.

18. These Joint Escrow Instructions shall be governed by, and construed and enforced in accordance with, the laws of the State of California.

Very truly yours,

ONCTERNAL THERAPEUTICS, INC.

By: /s/ James B. Breitmeyer
Name: James B. Breitmeyer, M.D., Ph.D.
Title: Chief Executive Officer

PURCHASER:

WILLIAM R. LARUE

/s/ William R. LaRue
Address: 5535 Corum Court
San Diego, CA 92130

ESCROW AGENT:

ONCTERNAL THERAPEUTICS, INC.

By: /s/ Richard G. Vincent

Name: Richard G. Vincent
Title: Secretary

EXHIBIT B

ASSIGNMENT SEPARATE FROM CERTIFICATE

FOR VALUE RECEIVED I, the undersigned, hereby sell, assign and transfer unto _____, _____ shares of the Common Stock of Oncternal Therapeutics, Inc. standing in my name of the books of said corporation represented by Certificate No. _____ herewith and do hereby irrevocably constitute and appoint Oncternal Therapeutics, Inc., to transfer the said stock on the books of the within named corporation with full power of substitution in the premises.

This Assignment Separate from Certificate, may be used only in accordance with the Restricted Stock Purchase Agreement between Oncternal Therapeutics, Inc. and the undersigned dated as of December 14, 2017.

Dated: _____, 201_

WILLIAM R. LARUE

By: /s/ William R. LaRue

INSTRUCTIONS: Please do not fill in the blanks other than the signature line. The purpose of this assignment is to enable the Company to exercise its "Repurchase Option," as set forth in the Agreement, without requiring additional signatures on the part of the Purchaser.

ELECTION UNDER INTERNAL REVENUE CODE SECTION 83(B)

The undersigned taxpayer hereby elects, pursuant to Section 83(b) of the Internal Revenue Code of 1986, as amended, to include in taxpayer's gross income for the current taxable year the amount of any compensation taxable to taxpayer in connection with taxpayer's receipt of shares (the "Shares") of Common Stock of Oncternal Therapeutics, Inc., a Delaware corporation (the "Company").

1. The name, address and taxpayer identification number of the undersigned taxpayer are:

   WILLIAM R. LARUE
   5535 Corum Court
   San Diego, CA 92130

   SSN: ____-____-_____

   The name, address and taxpayer identification number of the Taxpayer's spouse are (complete if applicable):

   _____
   _____
   _____

   SSN: ____-____-_____

   Description of the property with respect to which the election is being made:

   220,000 shares of Common Stock of the Company.

2. The date on which the property was transferred was December ___, 2017. The taxable year to which this election relates is calendar year 2017.

3. Nature of restrictions to which the property is subject:

   The Shares are subject to repurchase at their original purchase price if unvested as of the date of termination of employment, directorship or consultancy with the Company.

4. The fair market value at the time of transfer (determined without regard to any lapse restrictions, as defined in Treasury Regulation Section 1.83-3(a)) of the Shares was $0.05 per share.

5. The amount paid by the taxpayer for Shares was $0.00 per share.

6. A copy of this statement has been furnished to the Company.

Dated: _____ Taxpayer Signature _____

The undersigned spouse of Taxpayer joins in this election. (Complete if applicable).

Dated: _____ Spouse's Signature _____

ONCTERNAL THERAPEUTICS, INC.

RESTRICTED STOCK PURCHASE AGREEMENT

THIS RESTRICTED STOCK PURCHASE AGREEMENT ("***Agreement***") is made as of May 9, 2018, by and between **ONCTERNAL THERAPEUTICS, INC.**, a Delaware corporation (the "***Company***") and Charles Theuer, M.D., Ph.D. (the "***Purchaser***").

The parties agree as follows:

1. Issuance of Stock. The Company hereby agrees to issue to the Purchaser an aggregate of Two Hundred Thousand (200,000) shares of the Company's Common Stock (par value $0.0001 per share) (the "***Shares***"), in consideration of past or future services to the Company by the Purchaser.

2. Repurchase Option. In the event of any voluntary or involuntary termination of the services of the Purchaser to the Company for any or no reason before all of the Shares are released from the Company's Repurchase Option (as defined below), the Company shall, upon the date of such termination (as reasonably fixed and determined by the Company), have an irrevocable, exclusive option, but not the obligation, for a period of ninety (90) days from such date to repurchase all or any portion of the Unreleased Shares (as defined below in Section 3) at such time (the "***Repurchase Option***") at a purchase price of $0.0001 per share (the "***Repurchase Price***"). The Repurchase Option shall be exercisable by the Company by written notice to the Purchaser or the Purchaser's executor and shall be exercisable by delivery to the Purchaser or the Purchaser's executor of cash, check or wire transfer in an amount equal to the Repurchase Price times the number of Shares to be repurchased (the "***Aggregate Repurchase Price***"). Upon delivery of such notice and the payment of the Aggregate Repurchase Price, the Company shall become the legal and beneficial owner of the Shares being repurchased and all rights and interests therein or relating thereto, and the Company shall have the right to retain and transfer to its own name the number of Shares being repurchased by the Company. The Repurchase Option set forth in this Section 2 may be assigned by the Company in whole or in part in its sole and unfettered discretion.

3. Release of Shares From Repurchase Option.

(a) The Shares shall be released from the Company's Repurchase Option pursuant to the following schedule:

100% of the Shares (the "***Restricted Shares***") shall be subject to the Repurchase Option. 1/4th of the Restricted Shares shall be released from the Repurchase Option on the one (1) year anniversary of May 9, 2018 (the "***Vesting Commencement Date***") and 1/48th of the Restricted Shares shall be released from the Repurchase Option on each monthly anniversary following the one (1) year anniversary of the Vesting Commencement Date such that all of the Restricted Shares shall be released from the Repurchase Option on the fourth (4th) year anniversary of the Vesting Commencement Date, subject to the Purchaser's continuous employment or service to the Company on each such vesting date.

Any of the Shares which, from time to time, have not yet been released from the Repurchase Option are referred to herein as "***Unreleased Shares***." The number of Shares released each month from the Repurchase Option shall be rounded down to the next whole number of Shares, except in the last month of the fourth (4th) year period when all Unreleased Shares shall be released from the Repurchase Option.

(b) Subject to Section 6, the Shares which have been released from the Repurchase Option shall be delivered to the Purchaser at the Purchaser's request.

4. Restriction on Transfer. Except for the escrow described below in Section 6, none of the Shares or any beneficial interest therein shall be transferred, encumbered or otherwise disposed of in any manner until the release of such Shares from the Repurchase Option in accordance with the provisions of this Agreement.

5. Marital Dissolution or Legal Separation.

(a) Notwithstanding anything in this Agreement to the contrary, in connection with the dissolution of the Purchaser's marriage or the legal separation of the Purchaser and the Purchaser's spouse, the Company shall have the right (the "***Special Purchase Right***"), if applicable, to purchase from the Purchaser's spouse, in accordance with the provisions of this Section 5, all or any portion of the Shares which would otherwise be awarded to such spouse in settlement of any community property or other marital property rights such spouse may have in such shares.

(b) The Purchaser shall promptly provide the Company with written notice (the "***Dissolution Notice***") of (i) the entry of any judicial decree or order resolving the property rights of the Purchaser and the Purchaser's spouse in connection with their marital dissolution or legal separation or (ii) the execution of any contract or agreement relating to the distribution or division of such property rights. The Dissolution Notice shall be accompanied by a copy of the actual decree or order of dissolution or contract or agreement between the Purchaser and the Purchaser's spouse which provides for the award to the spouse of one or more Shares in settlement of any community property or other marital property rights such spouse may have in such shares.

(c) The Special Purchase Right shall be exercisable by delivery of written notice (the "***Purchase Notice***") to the Purchaser and the Purchaser's spouse within forty-five (45) days after the Company's receipt of the Dissolution Notice. The Purchase Notice shall indicate the number of Shares to be purchased by the Company, the date such purchase is to be effected (such date to be not less than five (5) business days, nor more than fifteen (15) business days, after the date of the Purchase Notice) and the fair market value to be paid for such Shares. The Purchaser (or the Purchaser's spouse, to the extent such spouse has physical possession of the Shares) shall, prior to the close of business on the date specified for the purchase, deliver to the Company the certificates representing the shares to be purchased. The Company shall, concurrently with the receipt of the stock certificates, pay to the Purchaser's spouse (in cash or cash equivalents) an amount equal to the fair market value specified for such shares in the Purchase Notice.

(d) If the Purchaser's spouse does not agree with the fair market value specified for the Shares in the Purchase Notice, then the spouse shall promptly notify the Company in writing of such disagreement and the fair market value of such Shares shall thereupon be determined by an appraiser of recognized standing selected by the Company and the spouse. If they cannot agree on an appraiser within fifteen (15) days after the date of the Purchase Notice, each shall select an appraiser of recognized standing, and the two (2) appraisers shall designate a third appraiser of recognized standing whose appraisal shall be determinative of such value. The cost of the appraisal shall be shared equally by the Company and the Purchaser's spouse. The closing shall then be held on the fifteenth (15th) business day following the completion of such appraisal; provided, however, that if the appraised value is more than twenty-five percent (25%) greater than the fair market value specified for the Shares in the Purchase Notice, the Company shall have the right, exercisable prior to the expiration of such fifteen (15) business-day period, to rescind the exercise of the Special Purchase Right and thereby revoke its election to purchase the Shares awarded to the spouse.

(e) The Special Purchase Right shall lapse upon the earlier to occur of (i) the lapse of the Repurchase Option or (ii) the expiration of the exercise period specified in this Section 5, to the extent the Special Purchase Right is not timely exercised in accordance with such this Section 5.

6. Escrow of Shares. Pursuant to the terms of the Joint Escrow Instructions attached hereto as Exhibit A, the Shares issued under this Agreement shall be held by the Escrow Agent (as defined in such Joint Escrow Instructions) along with a stock assignment executed by the Purchaser in blank in the form attached hereto as Exhibit B. Notwithstanding the monthly vesting set forth in Section 3 above, neither the Company nor the Escrow Agent shall be required to release or issue certificates evidencing the Shares to the Purchaser more frequently than twice in any calendar year.

7. Investment Representations. In connection with the purchase of the Shares, the Purchaser represents to the Company the following:

(a) The Shares to be purchased by the Purchaser hereunder will be acquired for investment for the Purchaser's own account and not with a view to the public resale or distribution thereof within the meaning of the Securities Act of 1933, as amended (the "***Securities Act***").

(b) The Purchaser has received or has had full access to all the information the Purchaser considers necessary or appropriate to make an informed investment decision with respect to the Shares.

(c) The Purchaser understands that the purchase of the Shares involves substantial risk. The Purchaser: (i) has experience as an investor in securities of companies in the development stage and acknowledges that the Purchaser is able to fend for itself, can bear the economic risk of the Purchaser's investment in the Shares and has such knowledge and experience in financial or business matters that it is capable of evaluating the merits and risks of its investment in the Shares and protecting its investment; and/or (ii) has a preexisting business relationship with the Company and/or certain of its other officers, directors or controlling persons of a nature and duration that enables the Purchaser to be aware of the character, business acumen and financial circumstances of such persons.

(d) The Purchaser has not been solicited to offer to purchase or to purchase any Shares by means of any general solicitation or advertising within the meaning of Regulation D promulgated under the Securities Act ("***Regulation D***").

(e) The Purchaser is not a person of the type described in Section 506(d) of Regulation D that would disqualify the Company from engaging in a transaction pursuant to Section 506 of Regulation D.

(f) The Purchaser understands that the Shares are characterized as "restricted securities" under the Securities Act, in a transaction not involving a public offering and that under the Securities Act and applicable regulations thereunder such securities may be resold without registration under the Securities Act only in certain limited circumstances. The Purchaser represents that it is familiar with Rule 144 of the Securities and Exchange Commission and understands the resale limitations imposed thereby and by the Securities Act. The Purchaser understands that the Company is under no obligation to register any of the securities sold hereunder.

8. Stock Certificate Legends; Other Restrictions.

(a) The share certificate evidencing the Shares issued hereunder shall be endorsed with the following legends:

i. THE SHARES REPRESENTED BY THIS CERTIFICATE HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "ACT"), AND HAVE BEEN ACQUIRED FOR INVESTMENT AND NOT WITH A VIEW TO, OR IN CONNECTION WITH, THE SALE OR DISTRIBUTION THEREOF. NO SUCH SALE, TRANSFER OR DISTRIBUTION MAY BE EFFECTED WITHOUT AN EFFECTIVE REGISTRATION STATEMENT RELATED THERETO OR AN APPLICABLE EXEMPTION FROM THE REGISTRATION REQUIREMENTS UNDER THE ACT.

ii. THE SHARES REPRESENTED BY THIS CERTIFICATE ARE SUBJECT TO A RIGHT OF FIRST REFUSAL OPTION IN FAVOR OF THE CORPORATION AND/OR ITS ASSIGNEE(S), AS PROVIDED IN THE BYLAWS OF THE CORPORATION, A COPY OF WHICH ARE ON FILE WITH THE SECRETARY OF THE CORPORATION.

iii. Any legend required by any applicable state securities laws.

(b) The Purchaser further acknowledges that it is a condition to the issuance of the Shares to the Purchaser that the Purchaser agrees to be bound by the terms and conditions of, and become a party to, any stockholders', voting or similar agreements of the Company, as required by the terms of such agreements. The Purchaser hereby agrees to be so bound and to execute any additional documents as may be deemed necessary or advisable by the Company in order to effectuate the foregoing agreements.

9. Market Stand-Off Agreement. The Purchaser hereby agrees, if so requested by the managing underwriters or the Company in connection with the initial public offering of the Company's Common Stock, that, without the prior written consent of such managing underwriters, the Purchaser will not offer, sell, contract to sell, grant any option to purchase, make any short sale or otherwise dispose of, assign any legal or beneficial interest in or make a distribution of any capital stock of the Company held by or on behalf of the Purchaser or beneficially owned by the Purchaser in accordance with the rules and regulations of the Securities and Exchange Commission for a period of up to 180 days after the date of the final prospectus relating to the Company's initial public offering.

10. Adjustment for Stock Split. All references to the number of Shares and the purchase price of the Shares in this Agreement shall be appropriately adjusted to reflect any stock split, reverse stock split or stock dividend or other similar change in the Shares which may be made by the Company after the date of this Agreement.

11. Tax Consequences. The Purchaser has reviewed with the Purchaser's own tax advisors the federal, state, local and foreign tax consequences of this investment and the transactions contemplated by this Agreement. The Purchaser is relying solely on such advisors and not on any statements or representations of the Company or any of its agents. The Purchaser understands that the Purchaser (and not the Company) shall be responsible for the Purchaser's own tax liability that may arise as a result of this investment or the transactions contemplated by this Agreement. The Purchaser understands that Section 83 of the Internal Revenue Code of 1986, as amended (the "Code"), taxes as ordinary income both (i) the difference between the fair market value of the Shares when the Company granted the Purchaser the right to purchase the Shares and the fair market value of the Shares on the date of this Agreement, and (ii) the difference between the amount paid for the Shares and the fair market value of the Shares as of the date any restrictions on the Shares lapse. In this context, "restriction" includes the right of the Company to buy back the Shares pursuant to its repurchase option. In the event the Company has registered under the Exchange Act, "restriction" with respect to officers, directors and 10% shareholders also means the period after the purchase of the Shares during which such officers, directors and 10% shareholders could be subject to suit under Section 16(b) of the Exchange Act. The Purchaser understands that the Purchaser may elect to be taxed at the time the Shares are purchased rather than when and as the Company's repurchase option or 16(b) period expires by filing an election under Section 83(b) of the Code with the I.R.S. within 30 days from the date of purchase.

THE PURCHASER ACKNOWLEDGES THAT IT IS THE PURCHASER'S SOLE RESPONSIBILITY AND NOT THE COMPANY'S TO TIMELY FILE THE ELECTION UNDER SECTION 83(b), EVEN IF THE PURCHASER REQUESTS THE COMPANY OR ITS REPRESENTATIVES TO MAKE THIS FILING ON THE PURCHASER'S BEHALF.

12. California Corporate Securities Law. THE SALE OF THE SECURITIES WHICH ARE THE SUBJECT OF THIS AGREEMENT HAS NOT BEEN QUALIFIED WITH THE COMMISSIONER OF CORPORATIONS OF THE STATE OF CALIFORNIA AND THE ISSUANCE OF SUCH SECURITIES OR THE PAYMENT OR RECEIPT OF ANY PART OF THE CONSIDERATION THEREFORE PRIOR TO SUCH QUALIFICATION IS UNLAWFUL, UNLESS THE SALE OF SECURITIES IS EXEMPT FROM THE QUALIFICATION BY SECTION 25100, 25102, OR 25105 OF THE CALIFORNIA CORPORATIONS CODE. THE RIGHTS OF ALL PARTIES TO THIS AGREEMENT ARE EXPRESSLY CONDITIONED UPON SUCH QUALIFICATION BEING OBTAINED, UNLESS THE SALE IS SO EXEMPT.

13. General Provisions.

(a) This Agreement shall be governed by the laws of the State of California. This Agreement represents the entire agreement between the parties with respect to the purchase of Common Stock by the Purchaser and may only be modified or amended in writing signed by both parties.

(b) Any notice, demand or request required or permitted to be given by either the Company or the Purchaser pursuant to the terms of this Agreement shall be in writing and shall be deemed given when delivered personally or deposited in the U.S. mail, First Class with postage prepaid, and addressed to the parties at the addresses of the parties set forth at the end of this Agreement or such other address as a party may request by notifying the other in writing.

(c) The rights and benefits of the Company under this Agreement shall be transferable to any one or more persons or entities, and all covenants and agreements hereunder shall inure to the benefit of, and be enforceable by the Company's successors and assigns. The rights and obligations of the Purchaser under this Agreement may only be assigned with the prior written consent of the Company and any purported transfer otherwise shall be null and void.

(d) Either party's failure to enforce any provision or provisions of this Agreement shall not in any way be construed as a waiver of any such provision or provisions, nor prevent that party thereafter from enforcing each and every other provision of this Agreement. The rights granted both parties herein are cumulative and shall not constitute a waiver of either party's right to assert all other legal remedies available to it under the circumstances.

(e) The Purchaser agrees upon request to execute any further documents or instruments necessary or desirable to carry out the purposes or intent of this Agreement.

(f) THE PURCHASER ACKNOWLEDGES AND AGREES THAT THE LAPSING OF THE REPURCHASE OPTION PURSUANT TO SECTION 3 HEREOF IS EARNED ONLY BY THE CONTINUING SERVICE OF THE PURCHASER TO THE COMPANY (AND NOT THROUGH THE ACT OF BEING HIRED OR PURCHASING SHARES HEREUNDER). THE PURCHASER FURTHER ACKNOWLEDGES AND AGREES THAT THIS AGREEMENT, THE TRANSACTIONS CONTEMPLATED HEREUNDER AND THE REPURCHASE OPTION

SCHEDULE SET FORTH HEREIN DO NOT CONSTITUTE AN EXPRESS OR IMPLIED PROMISE OF CONTINUED ENGAGEMENT OF THE PURCHASER AS A SERVICE PROVIDER FOR SUCH PERIOD, FOR ANY PERIOD, OR AT ALL, AND SHALL NOT INTERFERE WITH THE COMPANY'S RIGHT TO TERMINATE THE PURCHASER'S SERVICE TO THE COMPANY AT ANY TIME, WITH OR WITHOUT CAUSE.

(g) The Purchaser has reviewed this Agreement in its entirety, has had an opportunity to obtain the advice of counsel prior to executing this Agreement and fully understands all provisions of this Agreement.

[Remainder of page intentionally left blank]

IN WITNESS WHEREOF, the parties have duly executed this Agreement as of the date first set forth above.

COMPANY:

ONCTERNAL THERAPEUTICS, INC.,
a Delaware Corporation

By: /s/ James B. Breitmeyer
Name: James B. Breitmeyer, M.D., Ph.D.
Title: Chief Executive Officer

Address: 3525 Del Mar Heights Rd., #821
San Diego, CA 92130

PURCHASER:

CHARLES THEUER, M.D., PH.D.

/s/ Charles Theuer

Address: 1019 Oliver Avenue
San Diego, CA 92109

CONSENT OF SPOUSE

I, _____, spouse of Charles Theuer, M.D., Ph.D., have read and approve the foregoing Agreement. In consideration of granting of the right to my spouse to purchase shares of Oncternal Therapeutics, Inc. as set forth in the Agreement, I hereby appoint my spouse as my attorney-in-fact in respect to the exercise of any rights under the Agreement and agree to be bound by the provisions of the Agreement insofar as I may have any rights in said Agreement or any shares issued pursuant thereto under the community property laws of the State of California or similar laws relating to marital property in effect in the state of our residence as of the date of the signing of the foregoing Agreement.

Dated: May 9, 2018

_____

Signature

EXHIBIT A

JOINT ESCROW INSTRUCTIONS

May 9, 2018

Oncternal Therapeutics, Inc.
Attention: Secretary

Ladies and Gentlemen:

As escrow agent (the "***Escrow Agent***") for both Oncternal Therapeutics, Inc., a Delaware corporation (the "***Company***"), and the undersigned purchaser of stock of the Company (the "***Purchaser***"), you are hereby authorized and directed to hold the documents delivered to you pursuant to the terms of that certain Restricted Stock Purchase Agreement ("***Agreement***") between the Company and the undersigned (the "***Escrow***"), in accordance with the following instructions:

1. In the event the Company and/or any assignee of the Company (referred to collectively for convenience herein as the "***Company***") exercises the Company's Repurchase Option as defined in the Agreement), the Company shall give to the Purchaser and you a written notice specifying the number of shares of stock to be purchased, the purchase price and the time for a closing hereunder at the principal office of the Company. The Purchaser and the Company hereby irrevocably authorize and direct you to close the transaction contemplated by such notice in accordance with the terms of said notice.

2. At the closing, you are directed (a) to date the stock assignments necessary for the transfer in question, (b) to fill in the number of shares being transferred, and (c) to deliver same, together with the certificate evidencing the shares of stock to be transferred, to the Company or its assignee, against the simultaneous delivery to you of the purchase price (by cash, a check, cancellation of indebtedness or some combination thereof) for the number of shares of stock being purchased pursuant to the exercise of the Company's repurchase option.

3. The Purchaser irrevocably authorizes the Company to deposit with you any certificates evidencing shares of stock to be held by you hereunder and any additions and substitutions to said shares as defined in the Agreement. The Purchaser does hereby irrevocably constitute and appoint you as the Purchaser's attorney-in-fact and agent for the term of this Escrow to execute with respect to such securities all documents necessary or appropriate to make such securities negotiable and to complete any transaction herein contemplated, including but not limited to the filing with any applicable state blue sky authority of any required applications for consent to, or notice of transfer of, the securities. Subject to the provisions of the Agreement and of this Escrow Agreement, the Purchaser shall exercise all rights and privileges of a shareholder of the Company while the stock is held by you.

4. Upon written request of the Purchaser, but no more than twice per calendar year, unless the Company's repurchase option has been exercised, you will deliver to the Purchaser a certificate or certificates representing so many shares of stock as are not then subject to the Company's repurchase option. Within 90 days after cessation of the Purchaser's continuous employment by and/or service to the Company, or any parent or subsidiary of the Company, you will deliver to the Purchaser a certificate or certificates representing the aggregate number of shares held or issued pursuant to the Agreement and not purchased by the Company or its assignees pursuant to exercise of the Company's repurchase option.

5. If at the time of termination of this escrow you should have in your possession any documents, securities or other property belonging to the Purchaser, you shall deliver all of the same to the Purchaser and shall be discharged of all further obligations hereunder.

6. Your duties hereunder may be altered, amended, modified or revoked only by a writing signed by all of the parties hereto.

7. You shall be obligated only for the performance of such duties as are specifically set forth herein and may rely and shall be protected in relying or refraining from acting on any instrument reasonably believed by you to be genuine and to have been signed or presented by the proper party or parties. You shall not be personally liable for any act you may do or omit to do hereunder as Escrow Agent or as attorney-in-fact for the Purchaser while acting in good faith, and any act done or omitted by you pursuant to the advice of your own attorneys shall be conclusive evidence of such good faith.

8. You are hereby expressly authorized to disregard any and all warnings given by any of the parties hereto or by any other person or corporation, excepting only orders or process of courts of law and are hereby expressly authorized to comply with and obey orders, judgments or decrees of any court. In case you obey or comply with any such order, judgment or decree, you shall not be liable to any of the parties hereto or to any other person, firm or corporation by reason of such compliance, notwithstanding any such order, judgment or decree being subsequently reversed, modified, annulled, set aside, vacated or found to have been entered without jurisdiction.

9. You shall not be liable in any respect on account of the identity, authorities or rights of the parties executing or delivering or purporting to execute or deliver the Agreement or any documents or papers deposited or called for hereunder.

10. You shall not be liable for the outlawing of any rights under the statute of limitations with respect to these Joint Escrow Instructions or any documents deposited with you.

11. You shall be entitled to employ such legal counsel and other experts as you may deem necessary properly to advise you in connection with your obligations hereunder, may rely upon the advice of such counsel, and may pay such counsel reasonable compensation therefor.

12. Your responsibilities as Escrow Agent hereunder shall terminate if you shall cease to be an officer or agent of the Company or if you shall resign by written notice to each party. In the event of any such termination, the Company shall appoint a successor Escrow Agent.

13. If you reasonably require other or further instruments in connection with these Joint Escrow Instructions or obligations in respect hereto, the necessary parties hereto shall join in furnishing such instruments.

14. It is understood and agreed that should any dispute arise with respect to the delivery and/or ownership or right of possession of the securities held by you hereunder, you are authorized and directed to retain in your possession without liability to anyone all or any part of said securities until such disputes shall have been settled either by mutual written agreement of the parties concerned or by a final order, decree or judgment of a court of competent jurisdiction after the time for appeal has expired and no appeal has been perfected, but you shall be under no duty whatsoever to institute or defend any such proceedings.

15. Any notice required or permitted hereunder shall be given in writing and shall be deemed effectively given upon personal delivery or upon deposit in the United States Post Office, by registered or certified mail with postage and fees prepaid, addressed to each of the other parties thereunto entitled at the following addresses or at such other addresses as a party may designate by ten days' advance written notice to each of the other parties hereto.

COMPANY:	Oncternal Therapeutics, Inc. 3525 Del Mar Heights Rd., #821 San Diego, CA 92130 Attention: Secretary
PURCHASER	At the address listed after his or her signature.
ESCROW AGENT:	Oncternal Therapeutics, Inc. 3525 Del Mar Heights Rd., #821 San Diego, CA 92130 Attention: Secretary

16. By signing these Joint Escrow Instructions, you become a party hereto only for the purpose of said Joint Escrow Instructions; you do not become a party to the Agreement.

17. This instrument shall be binding upon and inure to the benefit of the parties hereto, and their respective successors and permitted assigns.

18. These Joint Escrow Instructions shall be governed by, and construed and enforced in accordance with, the laws of the State of California.

Very truly yours,

ONCTERNAL THERAPEUTICS, INC.

By: /s/ James B. Breitmeyer
Name: James B. Breitmeyer, M.D., Ph.D.
Title: Chief Executive Officer

PURCHASER:

CHARLES THEUER, M.D., PH.D.

/s/ Charles Theuer
Address: 1019 Oliver Avenue
San Diego, CA 92109

ESCROW AGENT:

ONCTERNAL THERAPEUTICS, INC.

By: /s/ Richard G. Vincent
Name: Richard G. Vincent
Title: Secretary

EXHIBIT B

ASSIGNMENT SEPARATE FROM CERTIFICATE

FOR VALUE RECEIVED I, the undersigned, hereby sell, assign and transfer unto _____, _____ shares of the Common Stock of Oncternal Therapeutics, Inc. standing in my name of the books of said corporation represented by Certificate No. _____ herewith and do hereby irrevocably constitute and appoint Oncternal Therapeutics, Inc., to transfer the said stock on the books of the within named corporation with full power of substitution in the premises.

This Assignment Separate from Certificate, may be used only in accordance with the Restricted Stock Purchase Agreement between Oncternal Therapeutics, Inc. and the undersigned dated as of May 9, 2018.

Dated: _____, 201_

CHARLES THEUER, M.D., PH.D.

By: /s/ Charles Theuer

INSTRUCTIONS: Please do not fill in the blanks other than the signature line. The purpose of this assignment is to enable the Company to exercise its "Repurchase Option," as set forth in the Agreement, without requiring additional signatures on the part of the Purchaser.

ELECTION UNDER INTERNAL REVENUE CODE SECTION 83(B)

The undersigned taxpayer hereby elects, pursuant to Section 83(b) of the Internal Revenue Code of 1986, as amended, to include in taxpayer's gross income for the current taxable year the amount of any compensation taxable to taxpayer in connection with taxpayer's receipt of shares (the "Shares") of Common Stock of Oncternal Therapeutics, Inc., a Delaware corporation (the "Company").

1. The name, address and taxpayer identification number of the undersigned taxpayer are:

   CHARLES THEUER, M.D., PH.D.

   _____
   _____
   _____

   SSN: ____-____-____

   The name, address and taxpayer identification number of the Taxpayer's spouse are (complete if applicable):

   _____
   _____
   _____

   SSN: ____-____-____

   Description of the property with respect to which the election is being made:

   200,000 shares of Common Stock of the Company.

2. The date on which the property was transferred was May 9, 2018. The taxable year to which this election relates is calendar year 2018.

3. Nature of restrictions to which the property is subject:

   The Shares are subject to repurchase at their original purchase price if unvested as of the date of termination of employment, directorship or consultancy with the Company.

4. The fair market value at the time of transfer (determined without regard to any lapse restrictions, as defined in Treasury Regulation Section 1.83-3(a)) of the Shares was $0.05 per share.

5. The amount paid by the taxpayer for Shares was $0.00 per share.

6. A copy of this statement has been furnished to the Company.

Dated: _____ Taxpayer Signature _____

The undersigned spouse of Taxpayer joins in this election. (Complete if applicable).

Dated: _____ Spouse's Signature _____

Exhibit 10.64

May 31, 2017

James Breitmeyer, M.D., Ph.D.
7572 Northern Lights
San Diego, CA 92127

Re: Employment Letter

Dear Jim:

Oncternal Therapeutics, Inc. (the "***Company***") is pleased to confirm the terms of your employment with the Company as set forth in this letter (this "***Agreement***"). Your employment with the Company was effective February 1, 2017.

- **DUTIES.** You shall continue to serve as, and shall perform such duties as are customarily associated with the position of, President and Chief Executive Officer and such other duties as are assigned to you by the Board of Directors of the Company (the "***Board***"). You shall report to the Board and shall perform your services on a full-time basis. You shall devote your full working time and attention to the business affairs of the Company.
- **COMPENSATION.** Your compensation will be as follows:
  - **BASE SALARY.** You will receive an annual base salary of $475,000.00 for all hours worked to be paid in accordance with the Company's customary payroll procedures.
  - **ANNUAL BONUS.** In addition to your base salary, you may be eligible to earn an annual cash performance bonus under the Company's bonus plan, if and when such a bonus plan is approved from time to time by the Board. In the event the Board implements an annual bonus plan, your maximum annual bonus will be a percentage of your base salary actually paid for the year to which such annual bonus relates. The Board will consult with you in good faith in evaluating the annual target bonus amounts. You must be employed by the Company on the date of payment of such annual bonus in order to be eligible to receive such annual bonus. You hereby acknowledge and agree that nothing contained herein confers upon you any right to an annual bonus in any year, and that whether the Company pays you an annual bonus and the amount of any such annual bonus will be determined by the Company in its sole discretion.
  - **BENEFITS.** You shall be eligible to participate in all of the employee benefit plans or programs the Company generally makes available to similarly situated employees, pursuant to the terms and conditions of such plans. You will initially be entitled to 20 days of paid time off each year, accruing on a monthly basis, and all holidays observed by the Company each year. The Company reserves the right to change compensation and benefits provided to its employees from time to time in its discretion.
  - **WITHHOLDING.** All amounts payable to you will be subject to appropriate payroll deductions and withholdings.

- **SEVERANCE.**
  - Subject to your continued compliance with the Company's Proprietary Information and Inventions Agreement, if your employment is terminated by the Company without Cause (as defined below) (and other than by reason of your death or Disability (as defined below)) or you resign for Good Reason (as defined below), you shall be entitled to receive, in lieu of any severance benefits to which you may otherwise be entitled under any severance plan or program of the Company, the benefits provided below:
    - Your fully earned but unpaid base salary, through the date such termination is effective at the rate then in effect, and all other amounts or benefits to which you are entitled under any compensation, retirement or benefit plan of the Company at the time of your termination of employment in accordance with the terms of such plans, including, without limitation, any continuation of benefits required by COBRA or applicable law;
    - Your monthly base salary as in effect immediately prior to the date of your termination of employment for 6 months (the "***Severance Period***"), payable in accordance with the Company's usual payroll practices (and in any event no less frequently than monthly), with the first installment commencing on the first payroll date that is 60 days following the date of your termination of employment (and any installment payments which would otherwise have been paid to you before the 60th day following the date of your termination of employment will be paid together with the first installment) (provided, however, that in the event such termination by the Company without Cause or resignation for Good Reason occurs following the occurrence of either a Qualifying Financing(s) (as defined below) or a Change in Control (as defined below), the Severance Period shall be increased to 12 months and the cash severance shall instead be paid in a lump sum on the Company's first regularly-scheduled payroll date after the effective date of the "Release" (as defined below)); and
    - For the Severance Period (or, if earlier, (1) the date on which the applicable continuation period under the Consolidated Omnibus Budget Reconciliation Act of 1985, as amended ("***COBRA***") expires or (2) the date you become eligible to receive the equivalent or increased healthcare coverage by means of subsequent employment or self-employment) (such period, the "***COBRA Coverage Period***"), if you and/or your eligible dependents who were covered under the Company's health insurance plans as of the date of your termination of employment elect to have COBRA coverage and are eligible for such coverage, the Company shall pay for or reimburse you on a monthly basis for an amount equal to (A) the monthly premium you and/or your covered dependents, as applicable, are required to pay for continuation coverage pursuant to COBRA for you and/or your eligible dependents, as applicable, who were covered under the Company's health plans as of the date of your termination of employment (calculated by reference to the premium as of the date of your termination of employment) less (B) the amount you would have had to pay to receive group health coverage for you

and/or your covered dependents, as applicable, based on the cost sharing levels in effect on the date of your termination of employment. If any of the Company's health benefits are self-funded as of the date of your termination of employment, or if the Company cannot provide the foregoing benefits in a manner that is exempt from Section 409A (as defined below) or that is otherwise compliant with applicable law (including, without limitation, Section 2716 of the Public Health Service Act), instead of providing the payments or reimbursements as set forth above, the Company shall instead pay to you the foregoing monthly amount as a taxable monthly payment for the COBRA Coverage Period (or any remaining portion thereof). You shall be solely responsible for all matters relating to continuation of coverage pursuant to COBRA, including, without limitation, the election of such coverage and the timely payment of premiums. You shall notify the Company immediately if you become eligible to receive the equivalent or increased healthcare coverage by means of subsequent employment or self-employment.

- In addition, you shall be entitled to the following additional Stock Award (as defined below) acceleration under the circumstances described below:
  - Upon a Change in Control, 50% of your unvested Stock Awards shall be automatically accelerated immediately prior to the occurrence of such Change in Control.
  - In the event your termination by the Company without Cause or your resignation for Good Reason occurs within 90 days prior to or at any time following a Change in Control, the vesting and/or exercisability of all of your outstanding unvested Stock Awards (as defined below) shall be automatically accelerated in full on the later of (a) the date of your termination of employment or (b) the date of the Change in Control.
  - Upon the termination of your employment by reason of your death or Disability (as defined below), the vesting and/or exercisability of all of your outstanding unvested Stock Awards (as defined below) shall be automatically accelerated in full on the date of your termination of employment.
  - The foregoing provisions are hereby deemed to be a part of each Stock Award and to supersede any less favorable provision in any agreement or plan regarding such Stock Award. For purposes of this Agreement, "***Stock Awards***" means all stock options, restricted stock and such other awards granted pursuant to the Company's stock option and equity incentive award plans or agreements and any shares of stock issued upon exercise thereof; provided, however, "***Stock Awards***" shall not include the founders' shares issued to you pursuant to that certain Restricted Stock Purchase Agreement dated as of February 26, 2016, as amended, the terms of which agreement shall govern the accelerated vesting of such shares.
- As a condition to your receipt of any post-termination payments and benefits pursuant to the preceding paragraphs, you shall execute and not revoke a general release of all claims in favor of the Company (the "***Release***") in a form acceptable to the Company. In the event the Release does not become effective within the 55-day period following the date of your termination of employment, you will not be entitled to the aforesaid payments and benefits.

- For purposes of this Agreement, "***Cause***" means any of the following: (a) your unauthorized use or disclosure of confidential information or trade secrets of the Company or any material breach of a written agreement between you and the Company, including without limitation a material breach of any employment, consulting, confidentiality, non-compete, non-solicit or similar agreement; (b) your commission of, indictment for or the entry of a plea of guilty or *nolo contendere* by you to, a felony under the laws of the United States or any state thereof or any crime involving dishonesty or moral turpitude (or any similar crime in any jurisdiction outside the United States); (c) your gross negligence or willful misconduct or your willful or repeated failure or refusal to substantially perform assigned duties; or (d) any act of fraud, embezzlement, material misappropriation or dishonesty committed by you against the Company. The foregoing definition shall not in any way preclude or restrict the right of the Company or any successor or affiliate thereof to discharge or dismiss you for any other acts or omissions, but such other acts or omissions shall not be deemed, for purposes of this Agreement, to constitute grounds for termination for Cause.
- For purposes of this Agreement, a "***Change in Control***" shall have the meaning given to such term in the Company's 2015 Equity Incentive Plan.
- For purposes of this Agreement, "***Disability***" shall mean a permanent and total disability within the meaning of Section 22(e)(3) of the Code, as it may be amended from time to time.
- For purposes of this Agreement, "***Good Reason***" shall mean the occurrence of any of the following events or conditions without your consent: (a) a change in your position with the Company (or its subsidiary employing you) that materially reduces your authority, duties or responsibilities; (b) a material diminution in the level of your base compensation, except in connection with a general reduction in the base compensation of the Company's personnel with similar status and responsibilities; (c) a relocation of your place of employment by more than 50 miles, provided that such change, reduction or relocation is effected by the Company (or its subsidiary employing you) without your consent; or (d) any material breach by the Company of its obligations to you under this agreement. Notwithstanding the foregoing, Good Reason shall only exist if you shall have provided the Company with written notice within 60 days of the initial occurrence of any of the foregoing events or conditions, and the Company or any successor or affiliate fails to eliminate the conditions constituting Good Reason within 30 days after receipt of written notice of such event or condition from you. Your resignation from employment with the Company for "Good Reason" must occur within six months following the initial occurrence of one of the foregoing events or conditions.
- For purposes of this Agreement, "***Qualifying Financing(s)***" shall mean the consummation of one or more equity financings yielding, within any 6 month period, aggregate gross proceeds to the Company of at least $20,000,000 in which investors purchase shares of the Company's Series C preferred stock or other equity securities.

- To the extent applicable, this Agreement shall be interpreted in accordance with Section 409A of the Internal Revenue Code of 1986, as amended (the "***Code***"), and Department of Treasury regulations and other interpretive guidance issued thereunder. To the extent that any provision in this Agreement is ambiguous as to its compliance with Section 409A of the Code, the provision shall be read in such a manner that no payments payable under this Agreement shall be subject to an "additional tax" as defined in Section 409A(a)(1)(B) of the Code. For purposes of Section 409A of the Code, the right to a series of installment payments under this Agreement shall be treated as a right to a series of separate payments. For purposes of this Agreement, all references to your "termination of employment" shall mean your "separation from service" (as defined in Treasury Regulation Section 1.409A-1(h)). If you are a "specified employee" (as defined in Section 409A of the Code), as determined by the Company in accordance with Section 409A of the Code, on the date of your termination of employment, to the extent that the payments or benefits under this Agreement are subject to Section 409A of the Code and the delayed payment or distribution of all or any portion of such amounts to which you are entitled under this Agreement is required in order to avoid a prohibited distribution under Section 409A(a)(2)(B)(i) of the Code, then such portion deferred pursuant to this paragraph shall be paid or distributed to you in a lump sum on the earlier of (a) the date that is six months and one day following your "separation from service" (as defined in Treasury Regulation Section 1.409A-1(h)), (b) the date of your death or (c) the earliest date as is permitted under Section 409A of the Code. Any remaining payments due under this Agreement shall be paid as otherwise provided herein.
- Any reimbursement of expenses or in-kind benefits payable under this Agreement shall be made in accordance with Treasury Regulation Section 1.409A-3(i)(1)(iv) and shall be paid on or before the last day of your taxable year following the taxable year in which you incurred the expenses. The amount of expenses reimbursed or in-kind benefits payable in one year shall not affect the amount eligible for reimbursement or in-kind benefits payable in any other taxable year of yours, and your right to reimbursement for such amounts shall not be subject to liquidation or exchange for any other benefit.

- **SECTION 280G; LIMITATIONS ON PAYMENT.**
  - If any payment or benefit you will or may receive from the Company or otherwise (a "***280G Payment***") would (a) constitute a "parachute payment" within the meaning of Section 280G of the Code, and (b) but for this sentence, be subject to the excise tax imposed by Section 4999 of the Code (the "***Excise Tax***"), then any such 280G Payment provided pursuant to this Agreement (a "***Payment***") shall be equal to the Reduced Amount. The "***Reduced Amount***" shall be either (x) the largest portion of the Payment that would result in no portion of the Payment (after reduction) being subject to the Excise Tax or (y) the largest portion, up to and including the total, of the Payment, whichever amount (i.e., the amount determined by clause (x) or by clause (y)), after taking into account all applicable federal, state and local employment taxes, income taxes, and the Excise Tax (all computed at the highest applicable marginal rate), results in your receipt, on an after-tax basis, of the greater economic benefit notwithstanding that all or some portion of the Payment may be subject to the Excise Tax. If a reduction in a Payment is required pursuant to the preceding

sentence and the Reduced Amount is determined pursuant to clause (x) of the preceding sentence, the reduction shall occur in the manner (the "***Reduction Method***") that results in the greatest economic benefit for you. If more than one method of reduction will result in the same economic benefit, the items so reduced will be reduced pro rata (the "***Pro Rata Reduction Method***").

- Notwithstanding any provision herein to the contrary, if the Reduction Method or the Pro Rata Reduction Method would result in any portion of the Payment being subject to taxes pursuant to Section 409A that would not otherwise be subject to taxes pursuant to Section 409A, then the Reduction Method and/or the Pro Rata Reduction Method, as the case may be, shall be modified so as to avoid the imposition of taxes pursuant to Section 409A as follows: (A) as a first priority, the modification shall preserve to the greatest extent possible, the greatest economic benefit for you as determined on an after-tax basis; (B) as a second priority, Payments that are contingent on future events (*e.g.*, being terminated without Cause), shall be reduced (or eliminated) before Payments that are not contingent on future events; and (C) as a third priority, Payments that are "deferred compensation" within the meaning of Section 409A shall be reduced (or eliminated) before Payments that are not deferred compensation within the meaning of Section 409A.
- Unless you and the Company agree on an alternative accounting firm or law firm, the accounting firm engaged by the Company for general tax compliance purposes as of the day prior to the effective date of the Change in Control transaction shall perform the foregoing calculations. If the accounting firm so engaged by the Company is serving as accountant or auditor for the individual, entity or group effecting the Change in Control transaction, the Company shall appoint a nationally recognized accounting or law firm to make the determinations. The Company shall bear all expenses with respect to the determinations by such accounting or law firm required to be made hereunder. The Company shall use commercially reasonable efforts to cause the accounting or law firm engaged to make the determinations hereunder to provide its calculations, together with detailed supporting documentation, to you and the Company within 15 calendar days after the date on which your right to a 280G Payment becomes reasonably likely to occur (if requested at that time by you or the Company) or such other time as requested by you or the Company.
- If you receive a Payment for which the Reduced Amount was determined pursuant to clause (x) above and the Internal Revenue Service determines thereafter that some portion of the Payment is subject to the Excise Tax, you agree to promptly return to the Company a sufficient amount of the Payment (after reduction pursuant to clause (x) above) so that no portion of the remaining Payment is subject to the Excise Tax. For the avoidance of doubt, if the Reduced Amount was determined pursuant to clause (y) above you shall have no obligation to return any portion of the Payment pursuant to the preceding sentence.

- **EXPENSES.** You will be entitled to reimbursement for all ordinary and reasonable out-of-pocket business expenses which are reasonably incurred by you in furtherance of the Company's business, with appropriate documentation and in accordance with the Company's standard policies.

- **ATTORNEYS' FEES.** The Company shall reimburse you for attorneys' fees incurred by you in consulting regarding and negotiating the terms of this Agreement, up to a maximum of five thousand dollars ($5,000).

- **COMPANY POLICIES AND PROPRIETARY INFORMATION AND INVENTIONS AGREEMENT.** As an employee of the Company, you shall be expected to abide by all of the Company's policies and procedures and the Company's employee handbook, if any. You have previously executed the Company's form of Proprietary Information and Inventions Agreement, which shall survive termination of your employment with the Company and the termination of this Agreement. You acknowledge that a remedy at law for any breach or threatened breach by you of the provisions of the Proprietary Information and Inventions Agreement would be inadequate, and you therefore agree that the Company shall be entitled to injunctive relief in case of any such breach or threatened breach. The Company may modify, revoke, suspend or terminate any of the terms, plans, policies and/or procedures described in the employee handbook, if any, or as otherwise communicated to you, in whole or part, at any time, with or without notice.

- **OTHER AGREEMENTS.** You represent and agree that your performance of your duties for the Company shall not violate any agreements, obligations or understandings that you may have with any third party or prior employer. You agree not to make any unauthorized disclosure or use, on behalf of the Company, of any confidential information belonging to any of your former employers. You also represent that you are not in unauthorized possession of any materials containing a third party's confidential and proprietary information. While employed by the Company, you will not engage in any business activity in competition with the Company nor make preparations to do so. In the event that you wish to undertake a business activity outside the scope of your employment by the Company, which activity you believe entails no conflict with the Company's activities, you agree to inform the Company of your intentions prior to the initiation of such outside business activity, and you furthermore agree to abide by the Company's decision as to whether or not there is no conflict. If, in the Company's sole determination, a conflict exists or is likely to develop, you agree not to undertake such outside business activity.

- **AT-WILL EMPLOYMENT.** Your employment with the Company will be "at-will" at all times, including after your introductory, probationary period, meaning that either you or the Company will be entitled to terminate your employment at any time and for any reason, with or without cause. Any contrary representations that may have been made to you are superseded by this offer. This Agreement in no way represents a fixed-term employment contract. This is the full and complete agreement between you and the Company on this term. Although your job duties, title, compensation and benefits, as well as the Company's personnel policies and procedures, may change from time to time, the "at-will" nature of your employment may only be changed in an express written agreement signed by you and a duly authorized officer of the Company.

- **NON-INTERFERENCE.** While employed by the Company, and for one year immediately following the date on which you terminate employment or otherwise cease providing services to the Company, you agree not to interfere with the business of the Company by (a) soliciting or attempting to solicit any employee or consultant of the Company to terminate such employee's or consultant's employment or service in order to become an employee, consultant or independent contractor to or for any other person or entity or (b) soliciting or attempting to solicit any vendor, supplier, customer or other person or entity either directly or indirectly, to direct his, her or its purchase of the Company's products and/or services to any person, firm, corporation, institution or other entity in competition with the business of the Company. Your duties under this paragraph shall survive termination of your employment with the Company and the termination of this Agreement.

- **DISPUTE RESOLUTION**. Unless otherwise prohibited by law or specified below, all disputes, claims and causes of action, in law or equity, arising from or relating to this Agreement or its enforcement, performance, breach, or interpretation shall be resolved solely and exclusively by final and binding arbitration held in San Diego, California through Judicial Arbitration & Mediation Services/Endispute ("***JAMS***") under the then existing JAMS arbitration rules applicable to employment disputes. The rules may be found online at www.jamsadr.com. The Company shall pay the arbitrator's fees and any filing fees associated with initiating a claim. This paragraph is intended to be the exclusive method for resolving any and all claims by the parties against each other relating to your employment; *provided* that you will retain the right to file administrative charges with or seek relief through any government agency of competent jurisdiction, and to participate in any government investigation, including but not limited to (a) claims for workers' compensation, state disability insurance or unemployment insurance; (b) claims for unpaid wages or waiting time penalties brought before the California Division of Labor Standards Enforcement (*provided* that any appeal from an award or from denial of an award of wages and/or waiting time penalties shall be arbitrated pursuant to the terms of this paragraph; and (c) claims for administrative relief from the United States Equal Employment Opportunity Commission and/or the California Department of Fair Employment and Housing (or any similar agency in any applicable jurisdiction other than California); *provided*, *further*, that you will not be entitled to obtain any monetary relief through such agencies other than workers' compensation benefits or unemployment insurance benefits. Further, nothing in this paragraph is intended to prevent either party from obtaining injunctive relief in court to prevent irreparable harm pending the conclusion of any such arbitration, including without limitation injunctive relief, in any court of competent jurisdiction pursuant to California Code of Civil Procedure § 1281.8 or any similar statute of an applicable jurisdiction. Seeking any such relief shall not be deemed to be a waiver of such party's right to compel arbitration. Each party in any such arbitration shall be responsible for its own attorneys' fees, costs and necessary disbursement; *provided, however,* that if one party refuses to arbitrate and the other party seeks to compel arbitration by court order, if such other party prevails, it shall be entitled to recover reasonable attorneys' fees, costs and necessary disbursements. Each party warrants that it has had the opportunity to be represented by counsel in the negotiation and execution of this Agreement, including the attorneys' fees provision herein. Both you and the Company expressly waive your right to a jury trial.

- **SEVERABILITY.** Whenever possible, each provision of this Agreement will be interpreted in such manner as to be effective and valid under applicable law, but if any provision of this Agreement is held to be invalid, illegal or unenforceable in any respect under any applicable law or rule in any jurisdiction, such invalidity, illegality or unenforceability will not affect any other provision or any other jurisdiction, but this Agreement will be reformed, construed and enforced in such jurisdiction as if such invalid, illegal or unenforceable provisions had never been contained herein.

- **SUCCESSORS AND ASSIGNS.** This Agreement is intended to bind and inure to the benefit of and be enforceable by you and the Company, and their respective successors, assigns, heirs, executors and administrators, except that you may not assign any of your duties hereunder and you may not assign any of your rights hereunder, without the written consent of the Company, which shall not be withheld unreasonably.

- **ENTIRE AGREEMENT.** This Agreement and the Proprietary Information and Inventions Agreement constitute the complete, final and exclusive embodiment of the entire agreement between you and the Company with respect to the terms and conditions of your employment specified herein and therein. This Agreement and the Proprietary Information and Inventions Agreement supersede any other such promises, warranties, representations or agreements between you and the Company, including, without limitation, that certain offer letter issued to you by the Company dated August 7, 2015 (although the provisions of such offer letter regarding your obligation to repay your signing bonus in the event of your voluntary termination of employment prior to the second anniversary of your receipt of such bonus shall survive and continue to apply). This Agreement may not be amended or modified except by a written instrument signed by you and a duly authorized officer of the Company.

• **GOVERNING LAW.** This Agreement will be governed by and construed in accordance with the laws of the State of California without regard to the conflicts of law provisions thereof.

Please acknowledge your acceptance by returning a signed copy of this Agreement to our attention.

Sincerely,

Oncternal Therapeutics, Inc.

/s/ David Johnson
Name: David Johnson
Title: Chairman of the Board

Agreed and Accepted:

I have read and understood this Agreement and hereby acknowledge, accept and agree to the terms as set forth above.

/s/ James Breitmeyer
James Breitmeyer, M.D., Ph.D.

Date: May 31, 2017

January 1, 2019

Richard Vincent
4732 Finchley Terrace
San Diego, CA 92130

Re: Employment Offer Letter

Dear Mr. Vincent:

Oncternal Therapeutics, Inc. (the "***Company***") is pleased to offer you a position on the terms set forth in this letter (this "***Agreement***").

- **DUTIES.** You shall serve and shall perform such duties as are customarily associated with the position of Chief Financial Officer and such other duties as are assigned to you by your supervisor. You shall initially report to James Breitmeyer, Chief Executive Officer and shall perform your services at 80% of a full-time basis. This is an exempt position.
- **COMPENSATION.** Your initial compensation will be as follows:
  - **BASE SALARY.** You will receive an annual base salary of $300,000 for all hours worked to be paid in accordance with the Company's customary payroll procedures.
  - **ANNUAL BONUS.** In addition to your base salary, you may be eligible to earn an annual cash performance bonus under the Company's bonus plan, as approved from time to time by the board of directors. In the event the board of directors implements an annual bonus plan, your maximum annual bonus will be a percentage of our base salary actually paid for the year to which such bonus relates. You must be employed by the Company on the date of payment of such annual bonus in order to be eligible to receive such annual bonus. You hereby acknowledge and agree that nothing contained herein confers upon you any right to an annual bonus in any year, and that whether the Company pays you an annual bonus and the amount of any such annual bonus will be determined by the Company in its sole discretion.
  - **STOCK OPTIONS.** In anticipation of your employment as contemplated herein, in November 2018 you were granted stock options to purchase 1,000,000 shares of the Company's common stock at an exercise price of $0.06 per share, the fair market value per share of the Company's common stock on the date of grant (the "***Stock Options***"). The Stock Options were granted pursuant to the Company's equity incentive plan (the "***Plan***"). The Stock Options are subject to the terms and conditions of the Plan and your stock option agreement. The Stock Options will vest over a four year vesting schedule.

- **BENEFITS.** You shall be eligible to participate in all of the employee benefit plans or programs the Company generally makes available to similarly situated employees, pursuant to the terms and conditions of such plans. You will initially be entitled to 15 days of paid time off each year, accruing on a monthly basis, and all holidays observed by the Company each year. The Company reserves the right to change compensation and benefits provided to its employees from time to time in its discretion.
- **WITHHOLDING.** All amounts payable to you will be subject to appropriate payroll deductions and withholdings.

- **SEVERANCE.**
  - Subject to your continued compliance with the Company's Proprietary Information and Inventions Agreement, if your employment is terminated by the Company without Cause (as defined below) (and other than by reason of your death or Disability (as defined below)) or you resign for Good Reason (as defined below), you shall be entitled to receive, in lieu of any severance benefits to which you may otherwise be entitled under any severance plan or program of the Company, the benefits provided below:
    - Your fully earned but unpaid base salary, through the date such termination is effective at the rate then in effect, and all other amounts or benefits to which you are entitled under any compensation, retirement or benefit plan of the Company at the time of your termination of employment in accordance with the terms of such plans, including, without limitation, any continuation of benefits required by COBRA or applicable law;
    - Your monthly base salary as in effect immediately prior to the date of your termination of employment for 6 months (the "***Severance Period***"), payable in accordance with the Company's usual payroll practices (and in any event no less frequently than monthly), with the first installment commencing on the first payroll date that is 60 days following the date of your termination of employment (and any installment payments which would otherwise have been paid to you before the 60th day following the date of your termination of employment will be paid together with the first installment) (provided, however, that in the event such termination by the Company without Cause or resignation for Good Reason occurs following the occurrence of either a Qualifying Financing(s) (as defined below) or a Change in Control (as defined below), the Severance Period shall be increased to 12 months and the cash severance shall instead be paid in a lump sum on the Company's first regularly-scheduled payroll date after the effective date of the "Release" (as defined below)); and
    - For the Severance Period (or, if earlier, (1) the date on which the applicable continuation period under the Consolidated Omnibus Budget Reconciliation Act of 1985, as amended ("***COBRA***") expires or (2) the date you become eligible to receive the equivalent or increased healthcare coverage by means of subsequent employment or self-employment) (such period, the "***COBRA Coverage Period***"), if you and/or your eligible dependents who were covered under the Company's health insurance plans as of the date of your termination

of employment elect to have COBRA coverage and are eligible for such coverage, the Company shall pay for or reimburse you on a monthly basis for an amount equal to (A) the monthly premium you and/or your covered dependents, as applicable, are required to pay for continuation coverage pursuant to COBRA for you and/or your eligible dependents, as applicable, who were covered under the Company's health plans as of the date of your termination of employment (calculated by reference to the premium as of the date of your termination of employment) less (B) the amount you would have had to pay to receive group health coverage for you and/or your covered dependents, as applicable, based on the cost sharing levels in effect on the date of your termination of employment. If any of the Company's health benefits are self-funded as of the date of your termination of employment, or if the Company cannot provide the foregoing benefits in a manner that is exempt from Section 409A (as defined below) or that is otherwise compliant with applicable law (including, without limitation, Section 2716 of the Public Health Service Act), instead of providing the payments or reimbursements as set forth above, the Company shall instead pay to you the foregoing monthly amount as a taxable monthly payment for the COBRA Coverage Period (or any remaining portion thereof). You shall be solely responsible for all matters relating to continuation of coverage pursuant to COBRA, including, without limitation, the election of such coverage and the timely payment of premiums. You shall notify the Company immediately if you become eligible to receive the equivalent or increased healthcare coverage by means of subsequent employment or self-employment.

- In addition, you shall be entitled to the following additional Stock Award (as defined below) acceleration under the circumstances described below:
    - Upon a Change in Control, 50% of your unvested Stock Awards shall be automatically accelerated immediately prior to the occurrence of such Change in Control.
    - In the event your termination by the Company without Cause or your resignation for Good Reason occurs within 90 days prior to or at any time following a Change in Control, the vesting and/or exercisability of all of your outstanding unvested Stock Awards (as defined below) shall be automatically accelerated in full on the later of (a) the date of your termination of employment or (b) the date of the Change in Control.
    - Upon the termination of your employment by reason of your death or Disability (as defined below), the vesting and/or exercisability of all of your outstanding unvested Stock Awards (as defined below) shall be automatically accelerated in full on the date of your termination of employment.
    - The foregoing provisions are hereby deemed to be a part of each Stock Award and to supersede any less favorable provision in any agreement or plan regarding such Stock Award. For purposes of this Agreement, "***Stock Awards***" means all stock options, restricted stock and such other awards granted pursuant to the Company's stock option and equity incentive award plans or agreements and any shares of stock issued upon exercise thereof.

- As a condition to your receipt of any post-termination payments and benefits pursuant to the preceding paragraphs, you shall execute and not revoke a general release of all claims in favor of the Company (the "***Release***") in a form acceptable to the Company. In the event the Release does not become effective within the 55-day period following the date of your termination of employment, you will not be entitled to the aforesaid payments and benefits.

- For purposes of this Agreement, "***Cause***" means any of the following: (a) your unauthorized use or disclosure of confidential information or trade secrets of the Company or any material breach of a written agreement between you and the Company, including without limitation a material breach of any employment, consulting, confidentiality, non-compete, non-solicit or similar agreement; (b) your commission of, indictment for or the entry of a plea of guilty or *nolo contendere* by you to, a felony under the laws of the United States or any state thereof or any crime involving dishonesty or moral turpitude (or any similar crime in any jurisdiction outside the United States); (c) your gross negligence or willful misconduct or your willful or repeated failure or refusal to substantially perform assigned duties; or (d) any act of fraud, embezzlement, material misappropriation or dishonesty committed by you against the Company. The foregoing definition shall not in any way preclude or restrict the right of the Company or any successor or affiliate thereof to discharge or dismiss you for any other acts or omissions, but such other acts or omissions shall not be deemed, for purposes of this Agreement, to constitute grounds for termination for Cause.

- For purposes of this Agreement, a "***Change in Control***" shall have the meaning given to such term in the Company's 2015 Equity Incentive Plan.

- For purposes of this Agreement, "***Disability***" shall mean a permanent and total disability within the meaning of Section 22(e)(3) of the Code, as it may be amended from time to time.

- For purposes of this Agreement, "***Good Reason***" shall mean the occurrence of any of the following events or conditions without your consent: (a) a change in your position with the Company (or its subsidiary employing you) that materially reduces your authority, duties or responsibilities; (b) a material diminution in the level of your base compensation, except in connection with a general reduction in the base compensation of the Company's personnel with similar status and responsibilities; (c) a relocation of your place of employment by more than 50 miles, provided that such change, reduction or relocation is effected by the Company (or its subsidiary employing you) without your consent; or (d) any material breach by the Company of its obligations to you under this agreement. Notwithstanding the foregoing, Good Reason shall only exist if you shall have provided the Company with written notice within 60 days of the initial occurrence of any of the foregoing events or conditions, and the Company or any successor or affiliate fails to eliminate the conditions constituting Good Reason within 30 days after receipt of written notice of such event or condition from you. Your resignation from employment with the Company for "Good Reason" must occur within six months following the initial occurrence of one of the foregoing events or conditions.

- For purposes of this Agreement, "***Qualifying Financing(s)***" shall mean the consummation of one or more equity financings yielding, within any 6 month period, aggregate gross proceeds to the Company of at least $20,000,000 in which investors purchase shares of the Company's Series C preferred stock or other equity securities.

- To the extent applicable, this Agreement shall be interpreted in accordance with Section 409A of the Internal Revenue Code of 1986, as amended (the "***Code***"), and Department of Treasury regulations and other interpretive guidance issued thereunder. To the extent that any provision in this Agreement is ambiguous as to its compliance with Section 409A of the Code, the provision shall be read in such a manner that no payments payable under this Agreement shall be subject to an "additional tax" as defined in Section 409A(a)(1)(B) of the Code. For purposes of Section 409A of the Code, the right to a series of installment payments under this Agreement shall be treated as a right to a series of separate payments. For purposes of this Agreement, all references to your "termination of employment" shall mean your "separation from service" (as defined in Treasury Regulation Section 1.409A-1(h)). If you are a "specified employee" (as defined in Section 409A of the Code), as determined by the Company in accordance with Section 409A of the Code, on the date of your termination of employment, to the extent that the payments or benefits under this Agreement are subject to Section 409A of the Code and the delayed payment or distribution of all or any portion of such amounts to which you are entitled under this Agreement is required in order to avoid a prohibited distribution under Section 409A(a)(2)(B)(i) of the Code, then such portion deferred pursuant to this paragraph shall be paid or distributed to you in a lump sum on the earlier of (a) the date that is six months and one day following your "separation from service" (as defined in Treasury Regulation Section 1.409A-1(h)), (b) the date of your death or (c) the earliest date as is permitted under Section 409A of the Code. Any remaining payments due under this Agreement shall be paid as otherwise provided herein.

- Any reimbursement of expenses or in-kind benefits payable under this Agreement shall be made in accordance with Treasury Regulation Section 1.409A-3(i)(1)(iv) and shall be paid on or before the last day of your taxable year following the taxable year in which you incurred the expenses. The amount of expenses reimbursed or in-kind benefits payable in one year shall not affect the amount eligible for reimbursement or in-kind benefits payable in any other taxable year of yours, and your right to reimbursement for such amounts shall not be subject to liquidation or exchange for any other benefit.

- **SECTION 280G; LIMITATIONS ON PAYMENT.**

  - If any payment or benefit you will or may receive from the Company or otherwise (a "***280G Payment***") would (a) constitute a "parachute payment" within the meaning of Section 280G of the Code, and (b) but for this sentence, be subject to the excise tax imposed by Section 4999 of the Code (the "***Excise Tax***"), then any such 280G Payment provided pursuant to this Agreement (a "***Payment***") shall be equal to the Reduced Amount. The "***Reduced Amount***" shall be either (x) the largest portion of the Payment that would result in no portion of the Payment (after reduction) being subject to the Excise Tax or (y) the largest portion, up to and including the total, of the Payment, whichever amount (i.e., the amount determined

by clause (x) or by clause (y)), after taking into account all applicable federal, state and local employment taxes, income taxes, and the Excise Tax (all computed at the highest applicable marginal rate), results in your receipt, on an after-tax basis, of the greater economic benefit notwithstanding that all or some portion of the Payment may be subject to the Excise Tax. If a reduction in a Payment is required pursuant to the preceding sentence and the Reduced Amount is determined pursuant to clause (x) of the preceding sentence, the reduction shall occur in the manner (the "***Reduction Method***") that results in the greatest economic benefit for you. If more than one method of reduction will result in the same economic benefit, the items so reduced will be reduced pro rata (the "***Pro Rata Reduction Method***").

- Notwithstanding any provision herein to the contrary, if the Reduction Method or the Pro Rata Reduction Method would result in any portion of the Payment being subject to taxes pursuant to Section 409A that would not otherwise be subject to taxes pursuant to Section 409A, then the Reduction Method and/or the Pro Rata Reduction Method, as the case may be, shall be modified so as to avoid the imposition of taxes pursuant to Section 409A as follows: (A) as a first priority, the modification shall preserve to the greatest extent possible, the greatest economic benefit for you as determined on an after-tax basis; (B) as a second priority, Payments that are contingent on future events (*e.g.*, being terminated without Cause), shall be reduced (or eliminated) before Payments that are not contingent on future events; and (C) as a third priority, Payments that are "deferred compensation" within the meaning of Section 409A shall be reduced (or eliminated) before Payments that are not deferred compensation within the meaning of Section 409A.
- Unless you and the Company agree on an alternative accounting firm or law firm, the accounting firm engaged by the Company for general tax compliance purposes as of the day prior to the effective date of the Change in Control transaction shall perform the foregoing calculations. If the accounting firm so engaged by the Company is serving as accountant or auditor for the individual, entity or group effecting the Change in Control transaction, the Company shall appoint a nationally recognized accounting or law firm to make the determinations. The Company shall bear all expenses with respect to the determinations by such accounting or law firm required to be made hereunder. The Company shall use commercially reasonable efforts to cause the accounting or law firm engaged to make the determinations hereunder to provide its calculations, together with detailed supporting documentation, to you and the Company within 15 calendar days after the date on which your right to a 280G Payment becomes reasonably likely to occur (if requested at that time by you or the Company) or such other time as requested by you or the Company.
- If you receive a Payment for which the Reduced Amount was determined pursuant to clause (x) above and the Internal Revenue Service determines thereafter that some portion of the Payment is subject to the Excise Tax, you agree to promptly return to the Company a sufficient amount of the Payment (after reduction pursuant to clause (x) above) so that no portion of the remaining Payment is subject to the Excise Tax. For the avoidance of doubt, if the Reduced Amount was determined pursuant to clause (y) above you shall have no obligation to return any portion of the Payment pursuant to the preceding sentence.

- **EXPENSES.** You will be entitled to reimbursement for all ordinary and reasonable out-of-pocket business expenses which are reasonably incurred by you in furtherance of the Company's business, with appropriate documentation and in accordance with the Company's standard policies.

- **COMPANY POLICIES AND PROPRIETARY INFORMATION AND INVENTIONS AGREEMENT.** As an employee of the Company, you shall be expected to abide by all of the Company's policies and procedures and the Company's employee handbook, if any. As a condition of your continued employment, you agree to execute and abide by the terms of the Company's form of Employee Confidentiality, Assignment and Nonsolicitation Agreement, which shall survive termination of your employment with the Company and the termination of this Agreement. You acknowledge that a remedy at law for any breach or threatened breach by you of the provisions of the Employee Confidentiality, Assignment and Nonsolicitation Agreement would be inadequate, and you therefore agree that the Company shall be entitled to injunctive relief in case of any such breach or threatened breach. The Company may modify, revoke, suspend or terminate any of the terms, plans, policies and/or procedures described in the employee handbook, if any, or as otherwise communicated to you, in whole or part, at any time, with or without notice.

- **EMPLOYMENT TERMS.** As a condition to your employment with the Company, you are required to (a) sign and return a satisfactory I-9 Immigration form providing sufficient documentation establishing your employment eligibility in the United States, and (b) provide satisfactory proof of your identity as required by United States law.

- **OTHER AGREEMENTS.** You represent and agree that your performance of your duties for the Company shall not violate any agreements, obligations or understandings that you may have with any third party or prior employer. You agree not to make any unauthorized disclosure or use, on behalf of the Company, of any confidential information belonging to any of your former employers. You also represent that you are not in unauthorized possession of any materials containing a third party's confidential and proprietary information. While employed by the Company, you will not engage in any business activity in competition with the Company nor make preparations to do so. In the event that you wish to undertake a business activity outside the scope of your employment by the Company, which activity you believe entails no conflict with the Company's activities, you agree to inform the Company of your intentions prior to the initiation of such outside business activity, and you furthermore agree to abide by the Company's decision as to whether or not there is no conflict. If, in the Company's sole determination, a conflict exists or is likely to develop, you agree not to undertake such outside business activity.

- **AT-WILL EMPLOYMENT.** Your employment with the Company will be "at-will" at all times, including after your introductory, probationary period, meaning that either you or the Company will be entitled to terminate your employment at any time and for any reason, with or without cause. Any contrary representations that may have been made to you are superseded by this offer. This Agreement in no way represents a fixed-term employment contract. This is the full and complete agreement between you and the Company on this term. Although your job duties, title, compensation and benefits, as well as the Company's personnel policies and procedures, may change from time to time, the "at will" nature of your employment may only be changed in an express written agreement signed by you and a duly authorized officer of the Company.

- **NON-INTERFERENCE.** While employed by the Company, and for one year immediately following the date on which you terminate employment or otherwise cease providing services to the Company, you agree not to interfere with the business of the Company by (a) soliciting or attempting to solicit any employee or consultant of the Company to terminate such employee's or consultant's

employment or service in order to become an employee, consultant or independent contractor to or for any other person or entity or (b) soliciting or attempting to solicit any vendor, supplier, customer or other person or entity either directly or indirectly, to direct his, her or its purchase of the Company's products and/or services to any person, firm, corporation, institution or other entity in competition with the business of the Company. Your duties under this paragraph shall survive termination of your employment with the Company and the termination of this Agreement.

- **DISPUTE RESOLUTION**. Unless otherwise prohibited by law or specified below, all disputes, claims and causes of action, in law or equity, arising from or relating to this Agreement or its enforcement, performance, breach, or interpretation shall be resolved solely and exclusively by final and binding arbitration held in San Diego, California through Judicial Arbitration & Mediation Services/Endispute ("***JAMS***") under the then existing JAMS arbitration rules. The rules may be found online at www.jamsadr.com. This paragraph is intended to be the exclusive method for resolving any and all claims by the parties against each other relating to your employment; *provided* that you will retain the right to file administrative charges with or seek relief through any government agency of competent jurisdiction, and to participate in any government investigation, including but not limited to (a) claims for workers' compensation, state disability insurance or unemployment insurance; (b) claims for unpaid wages or waiting time penalties brought before the California Division of Labor Standards Enforcement (*provided* that any appeal from an award or from denial of an award of wages and/or waiting time penalties shall be arbitrated pursuant to the terms of this paragraph; and (c) claims for administrative relief from the United States Equal Employment Opportunity Commission and/or the California Department of Fair Employment and Housing (or any similar agency in any applicable jurisdiction other than California); *provided*, *further*, that you will not be entitled to obtain any monetary relief through such agencies other than workers' compensation benefits or unemployment insurance benefits. Further, nothing in this paragraph is intended to prevent either party from obtaining injunctive relief in court to prevent irreparable harm pending the conclusion of any such arbitration, including without limitation injunctive relief, in any court of competent jurisdiction pursuant to California Code of Civil Procedure § 1281.8 or any similar statute of an applicable jurisdiction. Seeking any such relief shall not be deemed to be a waiver of such party's right to compel arbitration. Each party in any such arbitration shall be responsible for its own attorneys' fees, costs and necessary disbursement; *provided*, *however,* that if one party refuses to arbitrate and the other party seeks to compel arbitration by court order, if such other party prevails, it shall be entitled to recover reasonable attorneys' fees, costs and necessary disbursements. Each party warrants that it has had the opportunity to be represented by counsel in the negotiation and execution of this Agreement, including the attorneys' fees provision herein. Both you and the Company expressly waive your right to a jury trial.

- **SEVERABILITY.** Whenever possible, each provision of this Agreement will be interpreted in such manner as to be effective and valid under applicable law, but if any provision of this Agreement is held to be invalid, illegal or unenforceable in any respect under any applicable law or rule in any jurisdiction, such invalidity, illegality or unenforceability will not affect any other provision or any other jurisdiction, but this Agreement will be reformed, construed and enforced in such jurisdiction as if such invalid, illegal or unenforceable provisions had never been contained herein.

- **SUCCESSORS AND ASSIGNS.** This Agreement is intended to bind and inure to the benefit of and be enforceable by you and the Company, and their respective successors, assigns, heirs, executors and administrators, except that you may not assign any of your duties hereunder and you may not assign any of your rights hereunder, without the written consent of the Company, which shall not be withheld unreasonably.

- **ENTIRE AGREEMENT.** This Agreement and the Proprietary Information and Inventions Agreement constitute the complete, final and exclusive embodiment of the entire agreement between you and the Company with respect to the terms and conditions of your employment specified herein and therein.

This Agreement and the Proprietary Information and Inventions Agreement supersede any other such promises, warranties, representations or agreements between you and the Company. This Agreement may not be amended or modified except by a written instrument signed by you and a duly authorized officer of the Company.

- **GOVERNING LAW.** This Agreement will be governed by and construed in accordance with the laws of the State of California without regard to the conflicts of law provisions thereof.

- **START DATE.** Your start date will be on January 1, 2019..

If you choose to accept this Agreement under the terms described above, please acknowledge your acceptance of our offer by returning a signed copy of this letter, and the Proprietary Information and Inventions Agreement to our attention.

Sincerely,

Oncternal Therapeutics, Inc.

/s/ James Breitmeyer
Name: James Breitmeyer
Title: CEO

Agreed and Accepted:

I have read and understood this Agreement and hereby acknowledge, accept and agree to the terms as set forth above and further acknowledge and agree that no other commitments were made to me as part of my employment offer except as specifically set forth herein.

/s/ Richard Vincent Date: 1/7/2019
Richard Vincent

Attachments: Proprietary Information and Inventions Agreement

ONCTERNAL THERAPEUTICS, INC.

PROPRIETARY INFORMATION AND INVENTIONS AGREEMENT

The following confirms an agreement ("***Agreement***") between you and **ONCTERNAL THERAPEUTICS, INC.**, a Delaware corporation (the "***Company***," which term includes the Company's subsidiaries, successors and assigns), which is a material part of the consideration for my employment and continued employment by the Company:

1. **PROPRIETARY INFORMATION.** I understand that my employment creates a relationship of confidence and trust between me and the Company with respect to Proprietary Information of the Company, its business partners or its customers or suppliers which may be learned by me during the period of my employment or any period prior thereto wherein I was performing services for the Company or any predecessor thereof. For purposes of this Agreement, "***Proprietary Information***" is any information, data, trade secret or know-how (whether in tangible or electronic form or maintained in mind or memory or in another intangible form of expression) that was or is developed by, or became or becomes known by the Company or me in relation to my employment with the Company, or was or is assigned or otherwise conveyed to the Company. "***Proprietary Information***" includes, without limitation, all financial, business, scientific, technical, economic and/or engineering information, including without limitation, business strategies, business plans, forecasts, strategies, development plans, promotional and marketing objectives, results of research, trials or operations, pricing, customer lists, supplier lists, patent disclosures, patent applications, know-how, trade secrets, compilations, ideas, inventions, improvements, research, discoveries, techniques, methods, processes, manufacturing techniques, procedures, formulations, designs, patterns, drawings, flow charts, schematics, tooling, plans, configurations, specifications, documents, data sheets, mock-ups, models, compounds, compositions, structures, prototypes, programs, computer code, algorithms, mechanisms, materials, equipment, samples, test results, opinions, data, analysis, the salaries, duties, qualifications, performance levels, and terms of compensation of other employees and other proprietary information. Proprietary Information does not include any of the foregoing items that is or has become publicly and widely known and made generally available through no wrongful act of mine or of others who were under confidentiality obligations as to the item or items involved.

2. **COVENANTS AND AGREEMENTS.** In consideration of my employment by the Company and the compensation received by me from the Company from time to time, I hereby agree as follows:

(a) **Confidentiality.** At all times, both during my employment by the Company and after its termination, I will keep in confidence and trust and will not use or disclose any Proprietary Information or anything relating to it without the written consent of the Company, except as may be necessary in the ordinary course of performing my duties to the Company.

(b) **Return of Company Documents.** In the event of the termination of my employment by me or by the Company for any reason, I shall return all physical and electronic documents and records and all apparatus, equipment and other property, or any reproduction of such property, whether or not pertaining to Proprietary Information, furnished to me by the Company or produced by myself or others in connection with my employment, to the Company immediately as and when requested by the Company.

(c) **Disclosure of Inventions.** I will promptly disclose to the Company, or any persons designated by it, all Inventions made or conceived or reduced to practice or developed by me, either alone or jointly with others, during the term of my employment or any period prior thereto wherein I was performing services for the Company or any predecessor thereof. "***Inventions***" includes all improvements, inventions, discoveries, formulas, ideas, circuits, mask works, works of authorship, processes, computer

programs, algorithms, techniques, schematics, industrial designs, know-how and data, whether or not patentable. I will also disclose to the Company all Inventions conceived, reduced to practice, or developed by me within six (6) months of the termination of my employment with the Company. Such disclosure shall be received by the Company in confidence and does not extend the assignment made in Section 2(d) below.

(d) **Assignment of Inventions.** I agree that all Inventions which I make, conceive, reduce to practice or develop (in whole or in part, either alone or jointly with others) during my employment or any period prior thereto wherein I was performing services for the Company or any predecessor thereof shall be the sole property of the Company to the maximum extent permitted by law. I hereby assign to the Company any and all rights I may have or acquire in such Inventions and/or in any other Proprietary Information of the Company and any and all worldwide patents, patent applications, copyrights, mask work rights, industrial design rights, trade secret rights and other intellectual property rights related thereto or resulting therefrom. The Company's ownership and my assignment hereunder shall not extend to Inventions that (a) qualify fully under the provisions of Section 2870 of the California Labor Code, a copy of which is attached hereto as Exhibit A, if I am employed in California or (b) I developed entirely on my own time without using the Company's equipment, supplies, facilities, or trade secret information except for those inventions that either: (1) relate at the time of conception or reduction to practice of the invention to the Company's business, or actual or demonstrably anticipated research or development of the Company; or (2) result from any work performed by me for the Company.

(e) **Assignment of Moral Rights.** In addition to the foregoing assignment of Inventions to the Company, I hereby irrevocably transfer and assign to the Company any and all "Moral Rights" (as defined below) that I may have in or with respect to any Invention. I also hereby forever waive and agree never to assert any and all Moral Rights I may have in or with respect to any Invention, even after termination of my work on behalf of the Company. "Moral Rights" mean any rights to claim authorship of an invention to object to or prevent the modification of any Invention, or to withdraw from circulation or control the publication or distribution of any Invention, and any similar right, existing under judicial or statutory law of any country in the world, or under any treaty, regardless of whether or not such right is denominated or generally referred to as a "moral right."

(f) **Work for Hire**. I acknowledge and agree that any copyrightable works prepared by me within the scope of my employment are "works for hire" under the Copyright Act and that the Company will be considered the author and owner of such copyrightable works.

(g) **Prior Inventions.** I have attached as Exhibit B a complete list of all Inventions or improvements that relate to the business of the Company or actual or demonstrably anticipated research or development of the Company, that have been made or conceived or first reduced to practice by me alone or jointly with others prior to my employment by the Company or any period prior thereto wherein I was performing services for the Company or any predecessor thereof that I desire to clarify for the record are not Inventions which are to be assigned to Company under this Agreement, and I covenant that such list is complete. If no such list is attached to this Agreement, I represent that I have no such Inventions and improvements at the time of signing this Agreement. I will not use any prior Inventions in the performance of my duties without the prior express written consent of my supervisor, and if I do (but only if I do), I hereby grant to Company a perpetual, irrevocable, royalty-free, worldwide, full paid-up, transferable, sub-licensable, right and license to use and exploit the same.

(h) **Enforcement of Inventions; Further Actions.** I agree to perform, during and after my employment, all acts deemed necessary or desirable by the Company to permit and assist it, at the Company's expense, in obtaining, maintaining and enforcing patents, copyrights, trade secret rights, rights with respect to mask works or other rights on such Inventions and/or any other Inventions I have or may at

any time assign to the Company and any designee of the Company in any and all countries. Such acts may include, but are not limited to, execution of documents and assistance or cooperation in legal proceedings. I hereby irrevocably designate and appoint the Company and its duly authorized officers and agents, as my agents and attorneys-in-fact to act for and in my behalf and instead of me, to execute and file any applications or related filings and to do all other lawfully permitted acts to further the prosecution and issuance of patents, copyrights, trade secret rights, rights with respect to mask works or other rights thereon with the same legal force and effect as if executed by me.

(i) **Records.** I agree to keep and maintain adequate and current records (in the form of notes, sketches, drawings and in any other form that may be required by the Company) of all Proprietary Information developed by me and all Inventions made by me during the period of my employment at the Company, which records shall be available to and remain the sole property of the Company at all times.

(j) **No Solicitation.** During the term of my employment and for one (1) year thereafter, I will not, either directly or through others, solicit or attempt to solicit any employee, independent contractor or consultant of the Company to terminate his or her relationship with the Company in order to become an employee, consultant or independent contractor to or for any other person or entity, or otherwise encourage or solicit any employee of the Company to leave the Company for any reason or to devote less than all of any such employee's efforts to the affairs of the Company; provided that the foregoing shall not affect any responsibility I may have as an employee of the Company with respect to the bona fide hiring and firing of Company personnel.

(k) **No Conflicting Obligations.** I represent that my performance of all the terms of this Agreement will not breach any agreement or obligation to keep in confidence proprietary information acquired by me in confidence or in trust prior to my employment with the Company. I have not entered into, and I agree I will not enter into, any agreement either written or oral in conflict with this Agreement or in conflict with my employment with the Company.

(l) **No Improper Use of Information of Prior Employers and Others.** During my employment by the Company, I will not improperly use or disclose any confidential information or trade secrets, if any, of any former employer or any other person to whom I have an obligation of confidentiality, and I will not bring onto the premises of the Company any unpublished documents or any property belonging to any former employer or any other person to whom I have an obligation of confidentiality unless expressly authorized in writing by that former employer or person. Unless disclosed on Exhibit B hereto, I will use in the performance of my duties only information which is generally known and used by persons with training and experience comparable to my own, which is common knowledge in the industry or otherwise legally in the public domain, or which is otherwise provided or developed by the Company.

(m) **Notification of New Employer.** In the event that I leave the employ of the Company, I hereby consent to the notification of my new employer of my rights and obligations under this Agreement.

3. **GENERAL PROVISIONS.**

(a) **Employment.** I agree and understand that nothing in this Agreement shall confer any right with respect to continuation of employment by the Company, nor shall it interfere in any way with my right or the Company's right to terminate my employment at any time, with or without cause.

(b) **Successors and Assigns.** This Agreement shall be effective as of the first day of my employment by the Company, and shall be binding upon me, my heirs, executors, assigns, and administrators and shall inure to the benefit of the Company, its subsidiaries, successors and assigns.

(c) **Survival.** The provisions of this Agreement shall survive the termination of my employment and the assignment of this Agreement by the Company to any successor in interest or other assignee.

(d) **Legal and Equitable Remedies.** Because my services are personal and unique and because I may have access to and become acquainted with the Proprietary Information of the Company, the Company shall have the right to enforce this Agreement and any of its provisions by injunction, specific performance or other equitable relief, without bond and without prejudice to any other rights and remedies that the Company may have for a breach of this Agreement.

(e) **Severability.** If one or more provisions of this Agreement are held to be unenforceable under applicable law, such provisions shall be excluded from this Agreement and the balance of the Agreement shall be interpreted as if such provisions were so excluded and shall be enforceable in accordance with its terms.

(f) **Titles.** The titles and headings appearing at the beginning of the numbered sections and at the beginning of paragraphs have been inserted for convenience only and do not constitute any part of this Agreement.

(g) **Governing Law; Consent to Personal Jurisdiction**. I understand and agree that this Agreement shall be interpreted and enforced in accordance with the laws of the State of California without regard to the conflict of laws provisions thereof. I hereby expressly consent to the personal jurisdiction of the state and federal courts located in San Diego County, California for any lawsuit filed there against me by Company arising from or related to this Agreement.

(h) **Entire Agreement; Amendment.** This Agreement and the Exhibits hereto contain the entire understanding between the parties relating to the subject matter hereof and supersede any and all prior agreements, understandings and arrangements, whether written or oral, between the parties relating to such subject matter hereof. This Agreement may only be amended in writing by the Company and me and our respective permitted successors and assigns.

(i) **Counterparts.** This Agreement may be executed in counterparts, each of which shall be deemed an original and all of which together shall be deemed one instrument.

[*Signature Page Follows*]

Dated: 1/7/2019

/s/ Rich Vincent
Richard Vincent

Accepted and Agreed to:

ONCTERNAL THERAPEUTICS, INC.

By: /s/ James B. Breitmeyer
Name: James B. Breitmeyer, M.D. Ph.D.
Title: Chief Executive Officer

EXHIBIT A

§2870. Application of provision providing that employee shall assign or offer to assign rights in invention to employer.

(a) Any provisions in an employment agreement which provides that an employee shall assign, or offer to assign, any of his or her rights in an invention to his or her employer shall not apply to an invention that the employee developed entirely on his or her own time without using the employer's equipment, supplies, facilities, or trade secret information except for those inventions that either: (1) Relate at the time of conception or reduction to practice of the invention to the employer's business, or actual or demonstrably anticipated research or development of the employer; or (2) Result from any work performed by the employee for the employer.

(b) To the extent a provision in an employment agreement purports to require an employee to assign an invention otherwise excluded from being required to be assigned under subdivision (a), the provision is against the public policy of this state and is unenforceable.

EXHIBIT B

ONCTERNAL THERAPEUTICS, INC.

Ladies and Gentlemen:

1. The following is a complete list of all inventions or improvements that relate to the business of **ONCTERNAL THERAPEUTICS, INC.** (the "***Company***") or actual or demonstrably anticipated research or development of the Company, that have been made or conceived or first reduced to practice by me alone or jointly with others prior to my employment by the Company or any period prior thereto wherein I was performing services for the Company or any predecessor thereof that I desire to clarify for the record are not Inventions which are to be assigned to Company under the Company's Proprietary Information and Inventions Agreement.

____ No inventions or improvements.

____ See below:

Invention Description	Patent No.	Date of Issue

____ Additional sheets attached.

2. I propose to bring to my employment the following materials and documents of a former employer (provide copies of express written authorizations by former employer, if applicable):

____ No materials or documents.

/s/ Richard Vincent
Print Name: Richard Vincent

Richard Vincent, CPA
4732 Finchley Terrace
San Diego, CA 92130
Richvhome1@yahoo.com

Dear Rich:

Oncternal Therapeutics, Inc., a Delaware corporation ("Oncternal"), invites you to consult with and advise Oncternal with respect to its efforts to develop one or more oncology related biopharmaceutical products in accordance with the following terms and conditions:

1. Services.

At times agreeable to you and as requested by Oncternal, you will make available your services and consult with and advise Oncternal with to its financial activities, serve as its Chief Financial Officer and such other matters as may be agreed upon by Oncternal and you (the "Services"). You will not perform any Services for Oncternal except as authorized or requested by Oncternal. You agree to complete the Services in a satisfactory and workmanlike manner and to perform the Services in accordance with (a) the terms of this letter agreement (this "Agreement"), (b) all applicable laws, statutes, rules, regulations, ordinances and other pronouncements having the binding effect of law of any applicable government authority, court, tribunal, arbitrator, agency, legislative body or commission; and (iii) all Oncternal policies, procedures and guidance memoranda provided to you in connection with your performance under this Agreement.

2. Compensation.

a. As compensation for the Services to be rendered pursuant to this Agreement, Oncternal shall pay you at the rate of $12,000 per month. If your efforts exceed 8 days per month, you will be compensated at $200 per hour. You shall not be entitled to any other compensation or benefits for the Services. Oncternal shall make all payments in accordance with this Section 2(a) within thirty (30) days of receipt of an invoice from you itemizing the number of hours and/or any fractions thereof during which Services were rendered hereunder.

b. In addition, subject to approval of the Company's board of directors, you will be granted stock options to purchase 300,000 shares of the Company's common stock at an exercise price per share equal to the fair market value per share of the Company's common stock on the date of grant (the "*Stock Options").* The Stock Options will be granted pursuant to the Company's equity incentive plan (the *"Plan").* The Stock Options will be subject to the terms and conditions of the Plan and your stock option agreement. The Stock Options will vest over a three-year vesting schedule.

c. In addition, you shall be reimbursed for air travel (economy class) necessary and requested by Oncternal, and all reasonable living expenses, including, but not limited to, car rental,

meals and lodging incurred by you when rendering Services for Oncternal at locations away from your home or business. Any single expense in excess of Five Hundred Dollars ($500.00) must be pre-approved in writing by Onctemal. Onctemal shall make all payments in accordance with this Section 2(b) within thirty (30) days of receipt of an invoice from you itemizing your travel and other reimbursable expenses, including receipts for incidental expenses. Any amounts payable under this Section 2(b) shall be made in accordance with Treasury Regulation Section 1.409A-3(i)(1)(iv) and shall be paid on or before the last day of your taxable year following the taxable year in which you incurred the expenses. The amounts provided under this Section 2(b) during any taxable year of yours will not affect such amounts provided in any other taxable year of yours, and your right to reimbursement for such amounts shall not be subject to liquidation or exchange for any other benefit.

d. All cash compensation payments shall be included in your gross income as compensation for Services rendered and accordingly reported to the United States Internal Revenue Service on IRS Form 1099. You shall be responsible for payment of all taxes, including Social Security taxes, on income earned under this Agreement.

3. Independent Contractor.

a. It is agreed that you are to have complete freedom of action as to the details, methods, and means of performing requested Services. It is further understood that you are retained and have contracted with Onctemal only for the purposes and to the extent set forth in this Agreement, and your relationship to Oncternal and any of its subsidiary companies shall, during the period of your retainer and service, be that of an independent contractor, and you shall be free to dispose of such portion of your entire time, energy, and skill as you are not obligated to devote to Onctemal and its subsidiaries, in such manner as you see fit and to such persons, firms, or corporations as you deem advisable so long as same does not create a conflict of interest between Oncternal and such other persons, firms, or corporations.

b. You shall not be considered under the provisions of this Agreement or otherwise as having status as an employee of Oncternal, nor shall you be entitled hereafter to participate in any plans, arrangements, or distributions by Oncternal relating to any pension, deferred compensation, bonds, stock bonus, stock option, hospitalization, insurance, or other benefits extended to its employees since you are performing Services as an independent contractor.

c. Onctemal shall not make any deductions from your compensation for taxes, the payment of which shall be solely your responsibility. You shall pay, when and as due, any and all taxes incurred as a result of your compensation hereunder, including estimated taxes, and if requested by Onctemal, provide Oncternal with proof of said payments. Your further agree to indemnify Onctemal and hold it harmless to the extent of any obligation imposed on Onctemal; (i) to pay withholding taxes or similar items; or (ii) resulting from you being determined not to be an independent contractor.

d. You hereby represent and warrant that (i) neither this Agreement nor the performance thereof will conflict with or violate any of your obligations or any right of any third party; (ii) you are solely responsible for providing workers' compensation coverage for yourself and any of your employees assisting with the Services to the extent required under applicable law; (iii) you are solely responsible for compensating such employees, if any; (iv) you have obtained all licenses or certifications necessary to perform the Services; and (v) you shall comply with all applicable laws in the performance of Services.

4. Contract Period.

This Agreement becomes effective on the date hereof and will continue in effect for a period of one (1) year. It is provided, however, that (a) either you or Onctemal may terminate this Agreement at any time during its term by giving at least one (1) month's written notice and (b) this Agreement will terminate automatically upon your death or disability. Termination of this Agreement shall not affect Oncternal's obligation to pay for Services previously rendered by you or expenses reasonably incurred by you for which you are entitled to reimbursement under Section 2(b) of this Agreement

5. Intellectual Property.

a. "Intellectual Property" includes any and all new or useful art, original works of authorship, discovery, improvement, technical development, or invention, whether or not patentable or registrable under copyright and all related know-how, designs, trademarks, formulae, processes, manufacturing techniques, trade secrets, ideas, artworks, software or other copyrightable or patentable work, that you, solely or jointly with others, make, conceive or reduce to practice that resulted from or arose out of your Services for Oncternal under this Agreement. All right, title and interest of every kind and nature whatsoever in and to the Intellectual Property made, discussed, developed, secured, obtained or learned by you during the term of this Agreement, or the sixty (60)-day period immediately following termination of this Agreement, are hereby assigned to Onctemal, and shall be the sole and exclusive property of Onctemal for any purposes or uses whatsoever, and shall be disclosed promptly by you to Oncternal.

b. You agree to assist Oncternal in any reasonable manner to obtain and enforce for Oncternal's benefit any patents, copyrights and other property rights in any and all countries, with respect to any Intellectual Property, and you agree to execute, when requested, patent, copyright or similar applications and assignments to Onctemal and any other lawful documents deemed necessary by Onctemal to carry out the purposes of this Agreement with respect thereto. In the event that Oncternal is unable for any reason to secure your signature to any document required to apply for or execute any patent, copyright or other applications with respect to any Intellectual Property (including improvements, renewals, extensions, continuations, divisions or continuations in part thereof), after a written demand is made therefor upon you (which shall refer to the provisions of this paragraph), you hereby irrevocably designate and appoint Onctemal and its duly authorized officers and agents as your agents and attorneys-in-fact, which appointment is coupled with an interest, to act for and on your behalf and instead of you, to execute and file any such application and to do all other lawfully permitted acts to further the prosecution and issuance of patents, copyrights, mask works or other rights thereon with the same legal force and effect as if executed by you.

6. Security.

a. You shall, both during and subsequent to your Services, keep confidential any technical or other information of a confidential nature, including knowledge of our projects and general activities and any information not publicly disclosed relating to Oncternal's business which you may acquire through your consulting activities or otherwise ("Confidential Information"). You will not disclose Confidential Information in any manner without our express written permission; title to all property involved shall remain exclusively in Oncternal. Upon termination of your Services or this Agreement, or upon Oncternal's request at any time, you shall account for and return to Onctemal all papers containing any Confidential Information. In addition, you shall not disclose or otherwise transfer to Oncternal any confidential information that you may have acquired as a result of any previous employment or consulting relationship.

b. You represent that your performance of all the terms of this Agreement and your retention as a consultant by Oncternal do not and will not breach any agreement to keep in confidence confidential information acquired by you in confidence or in trust prior to your retention as a consultant by Oncternal. You have not entered into, and will not enter into, any agreement, either written or oral, in conflict herewith.

c. Notice of immunity from Liability for Confidential Disclosure of Confidential Information to the Government or in a Court Filing. In accordance with 18 U.S.C. § 1833, Oncternal hereby notifies you that, notwithstanding anything to the contrary herein:

(i) You shall not be in breach of this Agreement, and shall not be held criminally or civilly liable under any Federal or State trade secret law (A) for the disclosure of Confidential Information that is made in confidence to a Federal, State, or local government official or to an attorney solely for the purpose of reporting or investigating a suspected violation of law, or (B) for the disclosure of Confidential Information that is made in a complaint or other document filed in a lawsuit or other proceeding, if such filing is made under seal.

(ii) If you file a lawsuit for retaliation by Oncternal for reporting a suspected violation of law, you may disclose the Confidential Information to your attorney, and may use the Confidential Information in the court proceeding, if you file any document containing the trade secret under seal, and do not disclose the Confidential Information, except pursuant to court order.

7. Conflict of Interest and Non-Solicitation.

a. You agree that, during the term of this Agreement, you will not (except as otherwise herein provided), without Onctemal's express written consent, engage in any business or activity (whether as a consultant, advisor or otherwise) that may be deemed competitive with the business then engaged in by Oncternal.

b. During the term of this Agreement and for a period of twelve (12) months thereafter, you agree that, without the prior written consent of Oncternal, you will not, directly or indirectly, on your behalf or on behalf of any other person or entity, (i) call upon, solicit, divert or take away or attempt to solicit, divert or take away any of the customers, business or patrons of Oncternal; or (ii) solicit or attempt to solicit for employment any person who is then an employee of or consultant to Onctemal or who was an employee of or consultant to Oncternal at any time during the twelve (12) month period immediately prior to the date of the subject solicitation.

c. You and Oncternal acknowledge that the foregoing restrictions placed upon you are necessary and reasonable in scope and duration and are a material inducement to Oncternal to execute, deliver and perform its obligations arising under or pursuant to this Agreement, and that despite such restrictions you will be able to earn your livelihood and engage in your profession during the term of this Agreement.

8. Employment of Assistants.

Should you deem it necessary to employ assistants to aid you in the performance of the Services, you shall so notify Oncternal and obtain Oncternal's prior written consent The parties agree that Onctemal will not direct, supervise, or control in any way such assistants in their performance of Services. The parties further agree that such assistants are employed solely by you, and that you alone are responsible for providing workers' compensation insurance for your employees, for paying the salaries and wages of your employees, and for ensuring that all required tax withholdings are made. You further represent and warrant that you maintain workers' compensation insurance coverage for your employees and acknowledge that you alone have responsibility for such coverage. You shall impose upon such assistants the same confidentiality obligations as contained in this Agreement.

9. Indemnification.

a. To the fullest extent permitted by Oncternal's bylaws and applicable law, Oncternal shall indemnify you, defend you and hold you harmless from and against losses and expenses (including reasonable attorneys' fees, judgments, settlements and all other costs, direct or indirect) actually and reasonably incurred by reason of, or based upon, any threatened, pending or completed action, suit, proceeding, investigation or other dispute relating or pertaining to any alleged act or failure to act within the course and scope of the Services, provided that you were not in breach of this Agreement, acted in good faith and in a manner you reasonably believed to be in the best interests of Oncternal and, if any criminal proceedings are involved, had no reasonable cause to believe your conduct was unlawful. Oncternal's obligations under the foregoing sentence are conditioned upon you: (i) providing Onctemal with prompt notice of any such claims; (ii) allowing Oncternal to control the defense and settlement of such claims; (iii) providing Onctemal with the information and assistance necessary for such defense and settlement of the claims; and (iv) not entering into any settlement with respect to such claims without the express consent of Oncternal. Oncternal's obligation to advance expenses or provide indemnity hereunder shall be deemed satisfied to the extent of any payments made by an insurer on behalf of you or Oncternal.

b. You agree to indemnify, defend, and hold Onctemal free and harmless from all claims, demands, losses, costs, expenses, obligations, liabilities, damages, recoveries and deficiencies, including interest, penatties, attorneys' fees, and costs, that Onctemal may incur as a result of a breach by you of any representation or covenant contained in this Agreement.

10. Rights and Remedies Upon Breach.

If you breach or threaten to commit a breach of any of the provisions of Section 5, 6 or 7 of this Agreement (the "Protective Covenants"), you agree that such breach or threatened breach of the Protective Covenants would cause irreparable injury to Onctemal and that money damages would not provide an adequate remedy to Onctemal. Onctemal shall also have any other rights and remedies available to Oncternal under law or in equity.

11. Notice.

All notices and other communications under this Agreement shall be in writing. Unless and until you are notified in writing to the contrary, all notices, communications and documents directed to Oncternal and related to the Agreement, if not delivered by hand, shall be mailed, addressed as follows:

ONCTERNAL THERAPEUTICS, INC.
3525 Del Mar Heights Road, #821
San Diego, California 92130-2122
Attention: Chief Executive Officer

Unless and until Oncternal is notified in writing to the contrary, all notices, communications and documents intended for you and related to this Agreement, if not delivered by hand, shall be mailed to your last known address as shown on Oncternal's books. Notices and communications shall be mailed by registered or certified mail, return receipt requested, postage prepaid. All notices related to this Agreement shall be deemed received upon delivery or, if mailed, within five (5) days after mailing in accordance with this Section 11.

12. General Conditions.

a. If any of the provisions of this Agreement are found to be invalid under an applicable statute or rule of law, they are to be enforced to the maximum extent permitted by law and beyond such extent are to be deemed omitted from this Agreement, without affecting the validity of any other provision of this Agreement.

b. The term "Oncternal," as used herein, shall include any subsidiary or affiliate of Onctemal Therapeutics, Inc.

c. This Agreement shall be binding upon you, your heirs, executors, assigns and administrators and shall inure to the benefit of Onctemal, its successors and assigns. Oncternal's rights under this Agreement may, without your consent, be assigned by Oncternal, in its sole and unfettered discretion, to any person, firm, corporation or other business entity which at any time, whether by purchase, merger or otherwise, directly or indirectly, acquires all or substantially all of the assets or business of Oncternal. You may not assign, subcontract or otherwise delegate your obligations under this Agreement without Oncternal's prior written consent. Subject to the foregoing, this Agreement will be binding upon and inure to the benefit of the parties and their respective heirs, legal representatives, successors and assigns.

d. This Agreement shall be governed by and construed in accordance with the laws of the State of California, without regard to any provisions thereof relating to conflict of laws among different jurisdictions. Any suit brought hereon shall be brought in the state or federal courts sitting in San Diego, California, the parties hereby waiving any claim or defense that such forum is not convenient or proper. Each party hereby agrees that any such court shall have in personam jurisdiction over it and consents to service of process in any manner authorized by California law.

e. Unless otherwise prohibited by law or specified below, all disputes, claims and causes of action, in law or equity, arising from or relating to this Agreement or its enforcement, performance, breach, or interpretation shall be resolved solely and exclusively by final and binding arbitration held in San Diego, California through Judicial Arbitration & Mediation Services/Endispute ("JAMS") under the then existing JAMS arbitration rules. The rules may be found online at www.jamsadr.com. This paragraph is intended to be the exclusive method for resolving any and all claims by the parties against each other relating to the Services; *provided* that you will retain the right to file administrative charges with or seek relief through any government agency of competent jurisdiction, and to participate in any government investigation, including but not limited to (i) claims for workers' compensation, state disability insurance or unemployment insurance; (ii) claims for unpaid wages or waiting time penalties brought before the California Division of Labor Standards Enforcement *(provided* that any appeal from an award or from denial of an award of wages and/or waiting time penalties shall be arbitrated pursuant to the terms of this paragraph; and (iii) claims for administrative relief from the United States Equal Employment Opportunity Commission and/or the California Department of Fair Employment and Housing (or any similar agency in any applicable jurisdiction other than California); *provided, further,* that you will not be entitled to obtain any monetary relief through such agencies other than workers' compensation benefits or unemployment insurance benefits. Further, nothing in this paragraph is intended to prevent either party from obtaining injunctive relief in court to prevent irreparable harm pending the conclusion of any such arbitration, including without limitation injunctive relief, in any court of competent jurisdiction pursuant to California Code of Civil Procedure § 1281.8 or any similar statute of an applicable jurisdiction. Seeking any such relief shall not be deemed to be a waiver of such party's right to compel arbitration. Each party in any such arbitration shall be responsible for its own attorneys' fees, costs and necessary disbursement; *provided, however,* that if one party refuses to arbitrate and the other party seeks to compel arbitration by court order, if such other party prevails, it shall be entitled to recover reasonable attorneys' fees, costs and necessary disbursements. Each party warrants that it has had the opportunity to be represented by counsel in the negotiation and execution of this Agreement, including the attorneys' fees provision herein. Both you and Oncternal expressly waive their rights to a jury trial.

f. Either party's failure to enforce any right resulting from a breach of any provision of this Agreement shall not operate or be construed as a waiver of any other or subsequent breach by the other party.

g. The covenants, representations and warranties in this Agreement, including the covenants, representations and warranties found in Section 5, 6, 7 and 9, shall survive the termination of this Agreement.

h. You hereby acknowledge that you have been encouraged to consult with legal counsel (at your own expense) prior to executing this Agreement.

i. This Agreement may be executed in one or more counterparts, each of which shall be deemed an original but all of which together shall constitute one and the same instrument.

13. Prior Agreements.

This Agreement shall replace any prior agreement between you and Oncternal relative to your Services as a consultant, and this Agreement contains the entire understanding of the parties with respect to the Services to be provided by you. Further, it shall be amended only in writing agreed to by both parties.

Please indicate your acceptance of the foregoing by signing in the space provided below and returning one original letter to my attention.

Sincerely,

Oncternal Therapeutics, Inc.

By: /s/ James Breitmeyer
James Breitmeyer, M.D. Ph.D.
Chief Executive Officer

ACCEPTED AND AGREED to
This 3rd day of April, 2017

/s/ Richard Vincent 4/3/2017
Richard Vincent

On File
Tax Idenfication Number

[Signature Page to Consulting Agreement]

Exhibit 23.1

Consent of Independent Registered Public Accounting Firm

We consent to the reference to our firm under the caption “Experts” and to the use of our report dated March 18, 2019, included in the Proxy Statement of GTx, Inc. that is made a part of the Registration Statement (Form S-4) and related Prospectus of GTx, Inc. for the registration of shares of common stock, $0.001 par value per share, of GTx, Inc., issuable to holders of common stock, $0.0001 par value per share, and warrants and options of Oncternal Therapeutics, Inc., in the proposed merger of Grizzly Merger Sub, Inc., a wholly owned subsidiary of GTx, Inc., with and into Oncternal Therapeutics, Inc.

/s/ Ernst & Young LLP

Memphis, Tennessee
April 5, 2019

Exhibit 23.2

Consent of Independent Registered Public Accounting Firm

Oncternal Therapeutics, Inc.
San Diego, California

We hereby consent to the use in the Prospectus constituting a part of this Registration Statement of our report dated April 5, 2019, relating to the consolidated financial statements of Oncternal Therapeutics, Inc., which is contained in that Prospectus. Our report contains an explanatory paragraph regarding the Company's ability to continue as a going concern.

We also consent to the reference to us under the caption "Experts" in the Prospectus.

/s/ BDO USA, LLP

San Diego, California
April 5, 2019

Exhibit 99.3

Consent of Aquilo Partners, L.P.

The Board of Directors
GTx, Inc.
17 W Pontotoc Ave., Suite 100
Memphis, TN 38103

Members of the Board:

We hereby consent to the inclusion of our opinion letter, dated March 6, 2019, to the Board of Directors (in its capacity as such) of GTx, Inc. ("GTx") included as Annex B, and to the references thereto under the captions "Prospectus Summary – Opinion of the GTx Financial Advisor" and "The Merger – Opinion of the GTx Financial Advisor" in the proxy statement/prospectus/information statement relating to the proposed merger transaction involving GTx and Oncternal Therapeutics, Inc., which proxy statement/prospectus/information statement forms a part of this Registration Statement on Form S-4 of GTx. In giving the foregoing consent, we do not admit and we hereby disclaim that we come within the category of persons whose consent is required under Section 7 of the Securities Act of 1933, as amended (the "Securities Act"), or the rules and regulations promulgated thereunder, nor do we admit that we are experts with respect to any part of such registration statement within the meaning of the term "experts" as used in the Securities Act or the rules and regulations promulgated thereunder.

AQUILO PARTNERS, L.P.

By: */s/ John Rumsey*
Name: John Rumsey
Title: Managing Director

San Francisco, California
April 5, 2019

Exhibit 99.5

April 5, 2019

GTx, Inc.
17 W. Pontotoc Ave.
Suite 100
Memphis, TN 38103

Consent to Reference in Proxy Statement/Prospectus/Information Statement

GTx, Inc. (the "Company") is filing a Registration Statement on Form S-4 with the Securities and Exchange Commission under the Securities Act of 1933, as amended (the "Securities Act"). In connection therewith, I hereby consent, pursuant to Rule 438 of the Securities Act, to the reference to me in the proxy statement/prospectus/information statement included in such registration statement as a future member of the board of directors of the Company.

Sincerely,

/s/ Charles P. Theuer
Charles P. Theuer

Exhibit 99.6

April 5, 2019

GTx, Inc.
17 W. Pontotoc Ave.
Suite 100
Memphis, TN 38103

Consent to Reference in Proxy Statement/Prospectus/Information Statement

GTx, Inc. (the "Company") is filing a Registration Statement on Form S-4 with the Securities and Exchange Commission under the Securities Act of 1933, as amended (the "Securities Act"). In connection therewith, I hereby consent, pursuant to Rule 438 of the Securities Act, to the reference to me in the proxy statement/prospectus/information statement included in such registration statement as a future member of the board of directors of the Company.

Sincerely,

/s/ David F. Hale
David F. Hale

Exhibit 99.7

April 5, 2019

GTx, Inc.
17 W. Pontotoc Ave.
Suite 100
Memphis, TN 38103

Consent to Reference in Proxy Statement/Prospectus/Information Statement

GTx, Inc. (the "Company") is filing a Registration Statement on Form S-4 with the Securities and Exchange Commission under the Securities Act of 1933, as amended (the "Securities Act"). In connection therewith, I hereby consent, pursuant to Rule 438 of the Securities Act, to the reference to me in the proxy statement/prospectus/information statement included in such registration statement as a future member of the board of directors of the Company.

Sincerely,

/s/ James B. Breitmeyer
James B. Breitmeyer

Exhibit 99.8

April 5, 2019

GTx, Inc.
17 W. Pontotoc Ave.
Suite 100
Memphis, TN 38103

Consent to Reference in Proxy Statement/Prospectus/Information Statement

GTx, Inc. (the "Company") is filing a Registration Statement on Form S-4 with the Securities and Exchange Commission under the Securities Act of 1933, as amended (the "Securities Act"). In connection therewith, I hereby consent, pursuant to Rule 438 of the Securities Act, to the reference to me in the proxy statement/prospectus/information statement included in such registration statement as a future member of the board of directors of the Company.

Sincerely,

/s/ William R. LaRue
William R. LaRue

Exhibit 99.9

April 5, 2019

GTx, Inc.
17 W. Pontotoc Ave.
Suite 100
Memphis, TN 38103

Consent to Reference in Proxy Statement/Prospectus/Information Statement

GTx, Inc. (the "Company") is filing a Registration Statement on Form S-4 with the Securities and Exchange Commission under the Securities Act of 1933, as amended (the "Securities Act"). In connection therewith, I hereby consent, pursuant to Rule 438 of the Securities Act, to the reference to me in the proxy statement/prospectus/information statement included in such registration statement as a future member of the board of directors of the Company.

Sincerely,

/s/ Xin Nakanishi
Xin Nakanishi

Exhibit 99.10

April 5, 2019

GTx, Inc.
17 W. Pontotoc Ave.
Suite 100
Memphis, TN 38103

Consent to Reference in Proxy Statement/Prospectus/Information Statement

GTx, Inc. (the "Company") is filing a Registration Statement on Form S-4 with the Securities and Exchange Commission under the Securities Act of 1933, as amended (the "Securities Act"). In connection therewith, I hereby consent, pursuant to Rule 438 of the Securities Act, to the reference to me in the proxy statement/prospectus/information statement included in such registration statement as a future member of the board of directors of the Company.

Sincerely,

/s/ Yanjun Liu
Yanjun Liu

Exhibit 99.11

April 5, 2019

GTx, Inc.
17 W. Pontotoc Ave.
Suite 100
Memphis, TN 38103

Consent to Reference in Proxy Statement/Prospectus/Information Statement

GTx, Inc. (the “Company”) is filing a Registration Statement on Form S-4 with the Securities and Exchange Commission under the Securities Act of 1933, as amended (the “Securities Act”). In connection therewith, I hereby consent, pursuant to Rule 438 of the Securities Act, to the reference to me in the proxy statement/prospectus/information statement included in such registration statement as a future member of the board of directors of the Company.

Sincerely,

/s/ Daniel L. Kisner
Daniel L. Kisner