

**PROSPECTUS SUPPLEMENT**  
**(To Prospectus dated May 23, 2014)**

17,283,947 Shares

**Common Stock**

Pursuant to this prospectus supplement and the accompanying prospectus, we are offering up to 17,283,947 shares of our common stock at an offering price of \$0.81 per share, which was the consolidated closing bid price of our common stock on October 11, 2016. The shares of common stock offered hereby are being sold directly to certain investors, including J.R. Hyde III, a member of our board of directors and our largest stockholder, Robert J. Wills, our Executive Chairman, and Marc S. Hanover, our Chief Executive Officer, which investors collectively are referred to in this prospectus supplement as the Purchasers, pursuant to subscription agreements, each to be dated as of October 11, 2016.

We are not offering shares of our common stock under this prospectus supplement through a placement agent, underwriter or securities broker or dealer. The total proceeds to us, before expenses, will be approximately \$14.0 million, assuming that all of the shares offered hereby are purchased by the Purchasers. We estimate the total expenses of this offering to us will be \$385,000.

Our common stock is listed on The NASDAQ Capital Market under the symbol "GTXI." The last reported sale price of our common stock on October 11, 2016 was \$0.8193 per share. As of October 11, 2016, the aggregate market value of our outstanding common stock held by non-affiliates (our public float) was approximately \$51,118,467, which was calculated based on 59,899,774 shares of outstanding common stock held by non-affiliates and on a price per share of \$0.8534, the closing sale price of our common stock on October 10, 2016. We have not offered or sold any securities pursuant to General Instruction I.B.6 of Form S-3 during the prior 12 calendar month period that ends on, and includes, the date of this prospectus supplement.

***Investing in our common stock involves significant risks. See "Risk Factors" beginning on page S-3 of this prospectus supplement and in our Quarterly Report on Form 10-Q for the quarter ended June 30, 2016, which is incorporated by reference into this prospectus supplement and the accompanying prospectus.***

	Per Share	Total
Offering price and proceeds, before expenses, to us	\$ 0.81	\$ 13,999,997

Because there is no minimum offering amount required as a condition to closing in this offering, the actual total offering amount and proceeds to us, before expenses, may be substantially less than the amount set forth above.

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

Delivery of the shares is expected to be made on or about October 14, 2016 against payment for such shares to be received by us on the same date.

Prospectus Supplement dated October 11, 2016.

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## ABOUT THIS PROSPECTUS SUPPLEMENT

This document is in two parts. The first part is the prospectus supplement, which describes the specific terms of the common stock being offered by us, and also adds to and updates information contained in the accompanying prospectus and the documents incorporated by reference into the accompanying prospectus. The second part, the accompanying prospectus, including the documents incorporated by reference, provides more general information. Generally, when we refer to this prospectus, we are referring to both parts of this document combined. To the extent there is a conflict between the information contained in this prospectus supplement, on the one hand, and the information contained in the accompanying prospectus or in any document incorporated by reference that was filed with the SEC before the date of this prospectus supplement, on the other hand, you should rely on the information in this prospectus supplement. If any statement in one of these documents is inconsistent with a statement in another document having a later date — for example, a document incorporated by reference in the accompanying prospectus — the statement in the document having the later date modifies or supersedes the earlier statement.

You should rely only on the information contained or incorporated by reference in this prospectus supplement and the accompanying prospectus. We have not authorized anyone to provide you with different information. If anyone provides you with different or inconsistent information, you should not rely on it. We are not making an offer to sell these securities in any jurisdiction where the offer or sale is not permitted. You should assume that the information appearing in this prospectus supplement, the accompanying prospectus and the documents incorporated by reference in this prospectus supplement and the accompanying prospectus is accurate only as of the respective dates of those documents. Our business, financial condition, results of operations and prospects may have changed since those dates. You should read this prospectus supplement, the accompanying prospectus and the documents incorporated by reference in this prospectus supplement and the accompanying prospectus when making your investment decision. See “Where You Can Find Additional Information.”

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## PROSPECTUS SUPPLEMENT SUMMARY

*This summary highlights certain information about us, this offering and selected information contained elsewhere in or incorporated by reference into this prospectus supplement and the accompanying prospectus. This summary is not complete and does not contain all of the information that you should consider before deciding whether to invest in our common stock. For a more complete understanding of our company and this offering, you should read and consider carefully the more detailed information included or incorporated by reference in this prospectus supplement and the accompanying prospectus, including the factors described under the heading “Risk Factors” beginning on page S-3 of this prospectus supplement and in our Quarterly Report on Form 10-Q for the quarter ended June 30, 2016, which is incorporated by reference in this prospectus supplement and the accompanying prospectus.*

### GTx, Inc.

#### Our Business

We are a biopharmaceutical company dedicated to the discovery, development and commercialization of small molecules for the treatment of cancer, including treatments for breast and prostate cancer, and other serious medical conditions. Our current strategy is focused on the further development of selective androgen receptor modulators, or SARMs, a class of drugs that we believe has the potential to be used as a hormonal therapy for the treatment of advanced breast cancer, as well as the potential to treat other serious medical conditions where unmet medical needs in muscle-related diseases may benefit from increasing muscle mass, such as stress urinary incontinence, or SUI, and Duchenne muscular dystrophy, or DMD. In 2015, we entered into an exclusive worldwide license agreement with the University of Tennessee Research Foundation to develop its proprietary selective androgen receptor degrader, or SARD, technology, which has the potential to provide compounds that can degrade multiple forms of androgen receptor, or AR, to inhibit tumor growth in patients with progressive castration-resistant prostate cancer, including those patients who do not respond or are resistant to current therapies.

#### Financial Update

Our financial statements for the quarter ended September 30, 2016 will not be available until after this offering is completed and consequently will not be available to you prior to investing in this offering. Based upon preliminary estimates and information available to us as of the date of this prospectus supplement, we expect to report that we had approximately \$13.4 million of cash, cash equivalents and short-term investments as of September 30, 2016. We have not yet completed our quarter-end financial close process for the quarter ended September 30, 2016. This estimate of our cash, cash equivalents and short-term investments as of September 30, 2016 is preliminary, has not been audited and is subject to change upon completion of our financial closing procedures. This estimate is not a comprehensive statement of our financial results for the quarter ended September 30, 2016, and our actual results may

differ materially from this estimate as a result of the completion of our financial closing procedures, final adjustments and other developments arising between now and the time that our financial results for this period are finalized.

## Company Information

We were originally incorporated under the name Genotherapeutics, Inc. in Tennessee in September 1997. We changed our name to GTx, Inc. in 2001, and we reincorporated in Delaware in 2003. Our principal executive office is located at 175 Toyota Plaza, 7th Floor, Memphis, TN 38103, and our telephone number is (901) 523-9700. Our website address is [www.gtxinc.com](http://www.gtxinc.com). Information found on, or accessible through, our website is not a part of, and is not incorporated into, this prospectus supplement, and you should not consider it part of this prospectus supplement or the accompanying prospectus. Our website address is included in this document as an inactive textual reference only.

Unless the context requires otherwise, references in this prospectus supplement and the accompanying prospectus to “GTx,” “the company,” “we,” “us” and “our” refer to GTx, Inc. Service marks, trademarks and trade names included or incorporated by reference in this prospectus supplement or the accompanying prospectus are the property of their respective owners.

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### The Offering

Common stock we are offering	17,283,947 shares
Common stock to be outstanding after this offering	159,033,097 shares
Risk Factors	Investing in our common stock involves significant risks. See “Risk Factors” beginning on page S-3 of this prospectus supplement and in our Quarterly Report on Form 10-Q for the quarter ended June 30, 2016, which is incorporated by reference into this prospectus supplement and the accompanying prospectus.
Use of proceeds	To fund clinical development and other research and development activities and for working capital and general corporate purposes. See “Use of Proceeds” on page S-11.
NASDAQ Capital Market symbol	GTXI

The number of shares of common stock to be outstanding immediately after this offering as shown above is based on 141,749,150 shares of common stock outstanding as of June 30, 2016. This number excludes, as of June 30, 2016:

- 64,311,112 shares of our common stock issuable upon the exercise of warrants outstanding having an exercise price of \$0.85 per share;
- 11,102,467 shares of our common stock issuable upon the exercise of options outstanding having a weighted-average exercise price of \$2.87 per share;
- 6,256,666 shares of common stock issuable upon the vesting of restricted stock units outstanding;
- 453,635 shares of our common stock credited to individual non-employee director stock accounts under our Directors’ Deferred Compensation Plan; and
- an aggregate of 7,226,774 shares of our common stock reserved for future issuance under our Directors’ Deferred Compensation Plan and our stock option and equity incentive plans. This number does not include additional shares that will be reserved in connection with automatic annual increases to the number of shares issuable under the terms of our 2013 Equity Incentive Plan and our 2013 Non-Employee Director Equity Incentive Plan.

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### RISK FACTORS

*An investment in our common stock involves a high degree of risk. Before deciding whether to invest in our common stock, you should consider carefully the risks described below and discussed under the section captioned “Risk Factors” contained in our Quarterly Report on Form 10-Q for the quarter ended June 30, 2016, which is incorporated by reference in this prospectus supplement and the accompanying prospectus in its entirety, together with the other information in this prospectus supplement and the accompanying prospectus, and in the information and documents incorporated by reference. If any of these risks actually occurs, our business, financial condition, results of operations or cash flows could be seriously harmed. This could cause the trading price of our common stock to decline, resulting in a loss of all or part of your investment.*

#### **Risks Related to this Offering and Our Common Stock**

***We will continue to need substantial additional capital following this offering and may be unable to raise capital when needed, which would force us to delay, reduce or eliminate our development programs and could cause us to discontinue our operations. We cannot be certain that additional capital will be available to us and, if substantial additional capital is not available to us following this offering, we may not be able to continue as a going concern which may result in actions that could adversely impact our stockholders.***

Based on our current business plan and assumptions, we estimate that our current cash, cash equivalents and short-term investments and the anticipated net proceeds from this offering (assuming that all of the shares offered hereby are purchased by the Purchasers), together with interest thereon, will be sufficient to meet our projected operating requirements into the third quarter of 2017. Accordingly, we will continue to need substantial additional capital following this offering in order to fund our operations through and beyond the third quarter of 2017 and to continue as a going concern thereafter. In addition, we have based our cash sufficiency estimates on our current business plan and our assumptions that may prove to be wrong. We could utilize our available capital resources sooner than we currently expect, and we could need additional funding to sustain our operations even sooner than currently anticipated.

While we believe that, based on our current estimates of clinical trial expenditures and enrollment status, our existing capital resources, together with the anticipated net proceeds from this offering (assuming that all of the shares offered hereby are purchased by the Purchasers), will be adequate to enable us to obtain the results from the patients enrolled in our ongoing open-label Phase 2 clinical trials of enobosarm in patients with AR positive advanced breast cancer, as well as the results from our Phase 2 proof-of-concept clinical trial evaluating enobosarm to treat postmenopausal women with SUI, we will need to raise substantial additional capital in order to continue developing enobosarm for these indications. Also, our clinical trials may encounter technical, enrollment or other difficulties that could increase our development costs beyond our current estimates or delay our development timelines, and we could otherwise exhaust our available financial resources sooner than we expect. In any event, we will continue to need substantial additional capital following this offering in order to:

- initiate human clinical studies of our licensed SARD program;
- undertake any further development of our SARMs beyond our ongoing Phase 2 clinical trials of enobosarm in breast cancer and SUI and our ongoing preclinical development activities related to the development of SARMs as a potential treatment for DMD; and
- fund our operations and to continue as a going concern.

In any event, our future funding requirements will depend on many factors, including:

- the scope, rate of progress and cost of our preclinical and clinical development programs, including our ongoing and any future clinical trials of enobosarm;
- the terms and timing of any potential collaborative, licensing and other strategic arrangements that we may establish;
- the amount and timing of any licensing fees, milestone payments and royalty payments from potential collaborators, if any;
- future clinical trial results;

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- the cost and timing of regulatory filings and/or approvals to commercialize our 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 we have been able to fund our operations to date, we currently have no ongoing collaborations for the development and commercialization of our product candidates and no source of revenue, nor do we expect to generate revenue for the foreseeable future. We also do not have any commitments for future external funding. Accordingly, we expect to continue to seek access to additional funds through potential collaboration, partnering or other strategic arrangements, through public or private equity offerings or debt financings, or a combination of the foregoing. In October 2013, following our announcement that our POWER trials failed to achieve the results required by the U.S. Food and Drug Administration, or FDA, for us to submit a New Drug Application for enobosarm, we announced and implemented a workforce reduction of approximately 60%. If we are unable to raise additional funds following this offering to fund our operations through and beyond the third quarter of 2017 and to continue as a going concern thereafter, we could be required to, among other things, make further reductions in our workforce, eliminate our ongoing clinical trials, discontinue the development of enobosarm and/or SARDs, liquidate all or a portion of our assets, and/or seek protection under the provisions of the U.S. Bankruptcy Code, all of which would have a material adverse effect on our business and stock price.

To the extent that we raise additional funds through potential collaboration, partnering or other strategic arrangements, it may be necessary to relinquish rights to some of our technologies or product candidates, or grant licenses on terms that are not favorable to us, any of which could result in the stockholders of GTx having little or no continuing interest in our SARMs and/or SARDs programs as stockholders or otherwise. To the extent we raise additional funds by issuing equity securities, our stockholders may experience significant dilution, particularly given our currently depressed stock price, and debt financing, if available, may involve restrictive covenants. For example, we completed a private placement of common stock and warrants in March 2014, which was substantially dilutive, and completed a subsequent private placement in November 2014 that represented additional dilution, and our stockholders, including the Purchasers in this offering, may experience additional, perhaps substantial, dilution should we raise additional funds following this offering by issuing equity securities. Any debt financing or additional equity that we raise may contain terms that are not favorable to us or our stockholders. Our ability to raise additional funds and the terms upon which we are able to raise such funds have been severely harmed by the failure of our two prior enobosarm POWER trials to meet the primary statistical criterion for the co-primary endpoints agreed upon with the FDA, and may in the future be adversely impacted by the uncertainty regarding the prospects of our development of enobosarm for the treatment of patients with AR positive advanced breast cancer and our ability to advance the development of enobosarm or SARDs, if at all. Our ability to raise additional funds and the terms upon which we are able to raise such funds may also be adversely affected by the uncertainties regarding our financial condition, the sufficiency of our capital resources, our ability to maintain the listing of our common stock on The NASDAQ Capital Market, any reverse stock split that we would need to implement in an effort to maintain the listing of our common stock on The NASDAQ Capital Market, recent and potential future management turnover, and continued volatility and instability in the global financial markets, including as a result of the United Kingdom referendum resulting in a majority of U.K. voters voting to exit the European Union. As a result of these and other factors, we cannot be certain that additional funding will be available on acceptable terms, or at all.

***If we fail to meet continued listing standards of The NASDAQ Stock Market LLC, our common stock may be delisted. Delisting could adversely affect the liquidity of our common stock and the market price of our common stock could decrease, and our ability to obtain sufficient additional capital to fund our operations and to continue as a going concern would be substantially impaired.***

Our 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

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per share requirement for continued listing on The NASDAQ Capital Market, or the Bid Price Requirement. The notification had no immediate effect on the listing of our common stock. In accordance with NASDAQ listing rules, we were afforded 180 calendar days, or until June 20, 2016, to regain compliance with the Bid Price Requirement. On June 21, 2016, we received a letter from the Staff notifying us that we were eligible for an additional 180 calendar day period, or until December 19, 2016, to regain compliance with the minimum \$1.00 Bid Price Requirement. In the letter, the Staff noted that our common stock had not regained compliance with the Bid Price Requirement during the initial 180-day compliance period that ended on June 20, 2016 and that we had submitted written notice of our intention to cure the Bid Price Requirement deficiency by effecting a reverse stock split prior to December 19, 2016, if necessary. However, if it appears to the Staff that we will not be able to cure the deficiency, NASDAQ will notify us that our common stock will be subject to delisting. In the event of such a notification, we may appeal the Staff's determination to delist our common stock, but there can be no assurance the Staff would grant our request for continued listing. In addition, we may be unable to meet other applicable NASDAQ listing requirements, including maintaining minimum levels of stockholders' equity or market values of our common stock in which case, our common stock could be delisted notwithstanding our ability to demonstrate compliance with the Bid Price Requirement, whether through the implementation of a reverse stock split or otherwise.

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

- a limited availability of market quotations for our common stock;
- a reduced amount of news and analyst coverage for us;
- a decreased ability to issue additional securities and a concomitant substantial impairment in our ability to obtain sufficient additional capital to fund our operations and to continue as a going concern;
- reduced liquidity for our stockholders;
- potential loss of confidence by employees and potential future partners or collaborators; and
- loss of institutional investor interest and fewer business development opportunities.

***The market price of our common stock has been volatile and may continue to be volatile in the future. This volatility may cause our stock price and the value of your investment to decline.***

The market prices for securities of biotechnology companies, including ours, have been highly volatile and may continue to be so in the future. In this regard, the closing sale price for our common stock has varied between a high of \$1.57 on July 2, 2015 and a low of \$0.47 on January 15, 2016 in the twelve-month period ended June 30, 2016. The market price of our 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 our common stock:

- new or continued delays in the initiation, enrollment and/or completion of our ongoing and any future clinical trials of enobosarm, or negative, inconclusive or mixed results reported in any of our ongoing and any future clinical trials of enobosarm;
- our ability to raise additional capital in the near term to carry through with our preclinical and clinical development plans, including to potentially complete our ongoing Phase 2 clinical trials of enobosarm, as well as our current and future operations, and the terms of any related financing arrangements;
- reports of unacceptable incidences of adverse events observed in any of our ongoing clinical trials of enobosarm;
- announcements regarding further cost-cutting initiatives or restructurings;
- uncertainties created by our past and potential future management turnover;

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- our ability to enter into new collaborative, licensing or other strategic arrangements with respect to our product candidates;
- the terms and timing of any future collaborative, licensing or other arrangements that we may establish;
- announcements regarding our ability to comply with the minimum listing requirements of The NASDAQ Stock Market LLC;
- the timing of achievement of, or failure to achieve, our 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;
- announcement of FDA approval or non-approval of our product candidates or delays in or adverse events during the FDA review process;
- actions taken by regulatory agencies with respect to our product candidates or our clinical trials, including regulatory actions requiring or leading to a delay or stoppage of our ongoing clinical trials;

- the commercial success of any product approved by the FDA or its foreign counterparts;
- introductions or announcements of technological innovations or new products by us, our potential collaborators, or our competitors, and the timing of these introductions or announcements;
- 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;
- any intellectual property infringement lawsuit involving us;
- actual or anticipated fluctuations in our results of operations;
- changes in financial estimates or recommendations by securities analysts;
- hedging or arbitrage trading activity that may develop regarding our common stock;
- sales of large blocks of our common stock;
- sales of our common stock by our executive officers, directors and significant stockholders;
- the trading volume of our common stock;
- changes in accounting principles; and
- additional losses of any of our key scientific or management personnel.

In addition, the stock markets in general, and the markets for biotechnology stocks in particular, have experienced significant volatility that has often been unrelated to the operating performance of particular companies. These broad market fluctuations may adversely affect the trading price of our 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 us could result in substantial costs, which would hurt our financial condition and results of operations and divert management's attention and resources, which could result in delays of our clinical trials or commercialization efforts.

***Our executive officers, directors and largest stockholders have the ability to control all matters submitted to stockholders for approval.***

As of June 30, 2016, our executive officers, directors and holders of 5% or more of our outstanding common stock, including their affiliated or associated entities, held approximately 74.6% of our outstanding common stock, and our executive officers and directors alone, including their affiliated or associated entities, held approximately 36.2% of our outstanding common stock as well as warrants to purchase up to an additional 24.8 million shares of

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common stock, and this concentration of ownership will increase as a result of this offering. As a result, these stockholders, acting together, have and will continue to have following this offering, the ability to control all matters requiring approval by our stockholders, including the election of directors and the approval of mergers or other business combination transactions. The interests of this group of stockholders may not always coincide with our interests or the interests of other stockholders.

***Our ability to use our net operating loss carryforwards and certain other tax attributes may be limited.***

Under Section 382 of the Internal Revenue Code of 1986, as amended, 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 net operating loss carryforwards and other pre-change tax attributes (such as research tax credits) to offset its post-change taxable income or taxes may be limited. We completed a study through December 31, 2014 to determine whether any Section 382 limitations exist and, as a result of this study and our analysis of subsequent ownership changes, we do not believe that any Section 382 limitations exist through December 31, 2015, Section 382 of the Internal Revenue Code is an extremely complex provision with respect to which there are many uncertainties and we have not established whether the IRS agrees with our determination. In any event, this offering, future equity offerings and/or other changes in our stock ownership, some of which are outside of our control, could in the future result in an ownership change and an accompanying Section 382 limitation. If a limitation were to apply, utilization of a portion of our domestic net operating loss and tax credit carryforwards could 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 our charter documents and under Delaware law could make an acquisition of us, which may be beneficial to our stockholders, more difficult and may prevent attempts by our stockholders to replace or remove our current management.***

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

- a classified Board of Directors;

- a prohibition on actions by our stockholders by written consent;
- the ability of our Board of Directors 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 our Board of Directors; and
- limitations on the removal of directors.

Moreover, because we are incorporated in Delaware, we are governed by the provisions of Section 203 of the Delaware General Corporation Law, which prohibits a person who owns 15% or more of our outstanding voting stock from merging or combining with us for a period of three years after the date of the transaction in which the person acquired 15% or more of our 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 our Board of Directors 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.

***We have broad discretion in the use of the net proceeds from this offering and may not use them effectively.***

Our management will have broad discretion in the application of the net proceeds from this offering and could apply the proceeds in ways that do not necessarily improve our results of operations or enhance the value of our common stock. The failure by our management to apply these funds in a more effective manner could result in

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financial losses that could have a material adverse effect on our business, cause the price of our common stock to decline and delay the development and/or commercialization of our product candidates.

***You will experience immediate and substantial dilution in your investment in this offering. You will experience further dilution if we issue additional equity securities in future fundraising transactions.***

Since the price per share of our common stock being offered is substantially higher than the net tangible book value per share of our common stock, you will suffer substantial dilution with respect to the net tangible book value of the common stock you purchase in this offering. Based on the offering price of \$0.81 per share and our net tangible book value as of June 30, 2016, if you purchase shares of common stock in this offering, you will suffer immediate and substantial dilution of \$0.61 per share with respect to the net tangible book value of the common stock. See the section entitled “Dilution” below for a more detailed discussion of the dilution you will incur if you purchase common stock in this offering.

We expect that significant additional capital will be needed in the future to continue our planned operations. In addition, we may choose to raise additional capital due to market conditions or strategic considerations even if we believe we have sufficient funds for our current or future operating plans. To raise capital, we may sell substantial amounts of common stock or securities convertible into or exchangeable or exercisable for common stock. If we issue additional common stock, or securities convertible into or exchangeable or exercisable for common stock, our stockholders, including the Purchasers, could experience additional dilution, and any such issuances may result in downward pressure on the price of our common stock. In addition, new investors could gain rights, preferences and privileges senior to those of holders of our common stock.

***If there are substantial sales of our common stock, the market price of our common stock could drop substantially, even if our business is doing well.***

For the twelve-month period ended June 30, 2016, the average daily trading volume of our common stock on The NASDAQ Capital Market was 83,543 shares. As a result, future sales of a substantial number of shares of our common stock in the public market, or the perception that such sales may occur, could adversely affect the then-prevailing market price of our common stock. As of June 30, 2016, we had 141,749,150 shares of common stock outstanding. In addition, as a result of the relatively low trading volume of our common stock, the trading of relatively small quantities of shares by our stockholders may disproportionately influence the market price of our common stock in either direction. The price for our shares could, for example, decline significantly in the event that a large number of our 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 November 2014, we completed a private placement of 64.3 million shares of our common stock and warrants to purchase 64.3 million shares of our common stock. Similarly, in March 2014 we completed a private placement of 12.0 million shares of our common stock and warrants to purchase 10.2 million shares of our common stock. Pursuant to the terms of a registration rights agreement we entered into in connection with the March 2014 private placement, we filed a registration statement under the Securities Act registering the resale of the 12.0 million shares of common stock we issued to the investors in the March 2014 private placement, which include J.R. Hyde, III, our largest stockholder, as well as the 10.2 million shares of common stock underlying the warrants we issued to those investors (which warrants subsequently expired unexercised). Likewise, pursuant to the terms of the securities purchase agreement we entered into in connection with the November 2014 private placement, we filed registration statements under the Securities Act registering the resale of the 64.3 million shares of common stock we issued to the investors in the November 2014 private placement, which included J.R. Hyde, III, as well as the additional 64.3 million shares of common stock subject to the warrants we issued to the investors in the November 2014 private placement. Moreover, J.R. Hyde, III and certain of his affiliates, have rights under a separate registration rights agreement with us to require us to file resale registration statements covering an additional 7.9 million shares of common stock held in the aggregate or to include these shares in registration statements that we may file for ourselves or other stockholders. If Mr. Hyde or his affiliates or any of our other significant stockholders, including the other investors in our 2014 private placements, were to sell large blocks of shares in a short period of time, the market price of our common stock could drop substantially.

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This prospectus supplement, the accompanying prospectus, the documents we have filed with the SEC that are incorporated herein by reference, and any free writing prospectus that we have authorized for use in connection with this offering contain forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. These statements are based on our current expectations, assumptions, estimates and projections about our business and our industry, and involve known and unknown risks, uncertainties and other factors that may cause our results, levels of activity, performance or achievements to be materially different from any future results, levels of activity, performance or achievements expressed or implied by the forward-looking statements. Forward-looking statements include, but are not limited to, statements about:

- the implementation of our business strategies, including our ability to preserve or realize any significant value from our SARM and SARD programs;
- the therapeutic and commercial potential of, and our ability to advance the development of, enobosarm and our SARD development program;
- the timing, scope and anticipated initiation, enrollment and completion of our ongoing clinical trials and any other future clinical trials that we may conduct;
- our ability to establish and maintain potential new collaborative, partnering or other strategic arrangements for the development and commercialization of our product candidates;
- the anticipated progress of our preclinical and clinical programs, including whether our ongoing clinical trials will achieve clinically relevant results;
- the timing of regulatory discussions and submissions, and the anticipated timing, scope and outcome of related regulatory actions or guidance;
- our ability to obtain and maintain regulatory approvals of our product candidates and any related restrictions, limitations, and/or warnings in the label of an approved product candidate;
- our ability to market, commercialize and achieve market acceptance for our product candidates;
- our ability to protect our intellectual property and operate our business without infringing upon the intellectual property rights of others;
- the anticipated use of proceeds from this offering; and
- our estimates regarding the sufficiency of our cash resources, expenses, capital requirements and needs for additional financing, and our ability to obtain additional financing.

In some cases, you can identify forward-looking statements by terms such as “anticipate,” “believe,” “could,” “estimate,” “expect,” “intend,” “may,” “plan,” “potential,” “predict,” “project,” “should,” “will,” “would” and similar expressions intended to identify forward-looking statements. While we believe that we have a reasonable basis for each forward-looking statement, we caution you that these statements are based on a combination of facts and factors currently known by us and our projections of the future, about which we cannot be certain. We discuss many of these risks, uncertainties and other factors in greater detail under the heading “Risk Factors” beginning on page S-3 of this prospectus supplement and in our Quarterly Report on Form 10-Q for the quarter ended June 30, 2016, which is incorporated by reference in this prospectus supplement and the accompanying prospectus. Given these risks, uncertainties and other factors, you should not place undue reliance on these forward-looking statements. Also, these forward-looking statements represent our estimates and assumptions only as of the date such forward-looking statements are made. You should read carefully this prospectus supplement and the accompanying prospectus and the information incorporated herein by reference as described under the heading “Where You Can Find Additional Information” in this prospectus supplement completely and with the understanding that our actual future results may be materially different from what we expect. We hereby qualify all of our forward-looking statements by these cautionary statements.

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Except as required by law, we assume no obligation to update any forward-looking statements publicly, or to update the reasons actual results could differ materially from those anticipated in any forward-looking statements, even if new information becomes available in the future.

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## **USE OF PROCEEDS**

We estimate that the net proceeds from the sale of all of the 17,283,947 shares of common stock that we are offering hereby will be approximately \$13.6 million, after deducting estimated offering expenses payable by us. However, there is no minimum offering amount required as a condition to closing in this offering, and therefore the actual net proceeds to us from this offering may be substantially less.

We expect to use the net proceeds from this offering to fund clinical development and other research and development activities and for working capital and general corporate purposes. The amounts and timing of our use of the net proceeds from this offering will depend on a number of factors, including the timing and progress of our clinical trial and research and development efforts. As of the date of this prospectus supplement, we cannot specify with certainty all of the particular uses for the net proceeds to us from this offering. Accordingly, our management will have broad discretion in the application of these proceeds. Pending application of the net proceeds as described above, we intend to temporarily invest the proceeds in short-term, interest-bearing instruments or other investment-grade securities.

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## DILUTION

Our net tangible book value as of June 30, 2016 was approximately \$18.3 million, or approximately \$0.13 per share. Net tangible book value per share represents total tangible assets less total liabilities, divided by the number of shares of common stock outstanding. Dilution in net tangible book value per share represents the difference between the amount per share paid by the Purchasers in this offering and the net tangible book value per share of common stock immediately after this offering.

After giving effect to our sale of an aggregate of 17,283,947 shares of our common stock in this offering, and after deducting estimated offering expenses payable by us, our net tangible book value as of June 30, 2016 would have been approximately \$31.9 million, or \$0.20 per share. This represents an immediate increase in net tangible book value of \$0.07 per share to existing stockholders and an immediate dilution of \$0.61 per share to the Purchasers in this offering. The following table illustrates this dilution on a per share basis.

Offering price per share		\$	0.81
Net tangible book value per share as of June 30, 2016		\$	0.13
Increase per share attributable to this offering			<u>0.07</u>
As adjusted net tangible book value per share after this offering			<u>0.20</u>
Dilution per share to the Purchasers in this offering		\$	<u>0.61</u>

The above discussion and table are based on 141,749,150 shares of common stock issued and outstanding as of June 30, 2016 and exclude, as of June 30, 2016:

- 64,311,112 shares of our common stock issuable upon the exercise of warrants outstanding having an exercise price of \$0.85 per share;
- 11,102,467 shares of our common stock issuable upon the exercise of options outstanding having a weighted-average exercise price of \$2.87 per share;
- 6,256,666 shares of common stock issuable upon the vesting of restricted stock units outstanding;
- 453,635 shares of our common stock credited to individual non-employee director stock accounts under our Directors' Deferred Compensation Plan; and
- an aggregate of 7,226,774 shares of our common stock reserved for future issuance under our Directors' Deferred Compensation Plan and our stock option and equity incentive plans. This number does not include additional shares that will be reserved in connection with automatic annual increases to the number of shares issuable under the terms of our 2013 Equity Incentive Plan and our 2013 Non-Employee Director Equity Incentive Plan.

To the extent that outstanding options or warrants are exercised, restricted stock units vest or other shares issued, the Purchasers in this offering may experience further dilution. We expect that significant additional capital will be needed in the future to continue our planned operations. In addition, we may choose to raise additional capital due to market conditions or strategic considerations even if we believe we have sufficient funds for our current or future operating plans. To the extent that additional capital is raised through the sale of equity or convertible debt securities, the issuance of these securities could result in further dilution to the Purchasers in this offering.

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## PLAN OF DISTRIBUTION

We are offering up to 17,283,947 shares of our common stock at an offering price of \$0.81 per share, which was the consolidated closing bid price of our common stock on October 11, 2016. The shares of common stock offered hereby are being sold directly to the Purchasers and not through a placement agent, underwriter or securities broker or dealer, and we are therefore not paying any underwriting discounts, commissions, concessions or similar compensation for the sale and distribution of the common stock being offered hereby.

We intend to enter into subscription agreements with the Purchasers covering the sale of the shares offered under this prospectus supplement. A copy of the form of subscription agreement between us and the Purchasers will be included as an exhibit to a Current Report on Form 8-K that will be filed with the SEC. We currently anticipate that closing of the sale of all 17,283,947 shares of common stock offered hereby will take place on or about October 14, 2016. The total proceeds to us, before expenses, will be approximately \$14.0 million, assuming that all of the shares offered hereby are purchased by the Purchasers. However, there is no minimum offering amount required as a condition to closing in this offering, and therefore the actual total offering proceeds to us, before expenses, may be substantially less. On the closing date, we will issue the shares of common stock to the Purchasers and we will receive funds in the amount of the aggregate purchase price of the common stock being sold hereby. The estimated offering expenses payable by us for this offering are approximately \$385,000.

The transfer agent for our common stock is Computershare Trust Company, N.A. located at 33 North LaSalle Street Suite 1100, Chicago, IL 60602.

Our common stock is listed on The NASDAQ Capital Market under the symbol "GTXI."

## LEGAL MATTERS

The validity of the common stock offered by this prospectus supplement and the accompanying prospectus will be passed upon for us by Cooley LLP, San Francisco, California.

## EXPERTS

Ernst & Young LLP, independent registered public accounting firm, has audited our financial statements included in our Annual Report on Form 10-K for the year ended December 31, 2015, and the effectiveness of our internal control over financial reporting as of December 31, 2015, as set forth in their reports, which are incorporated by reference in this prospectus supplement, the accompanying prospectus and elsewhere in the registration statement of which the accompanying prospectus is a part. Our financial statements are incorporated by reference in reliance on Ernst & Young LLP's reports, given on their authority as experts in accounting and auditing.

## WHERE YOU CAN FIND ADDITIONAL INFORMATION

We file annual, quarterly and special reports, proxy statements and other information with the SEC. You may read and copy any document we file at the SEC's Public Reference Room at 100 F Street, N.E., Washington, D.C. 20549. Please call the SEC at 1-800-SEC-0330 for more information about the operation of the public reference room. The SEC maintains an Internet site that contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC, including GTx, Inc. The SEC's Internet site can be found at [www.sec.gov](http://www.sec.gov).

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The SEC allows us to "incorporate by reference" information from other documents that we file with it, which means that we can disclose important information to you by referring you to those documents. The information incorporated by reference is considered to be part of this prospectus supplement and the accompanying prospectus. Information contained in this prospectus supplement and the accompanying prospectus and information that we file with the SEC in the future and incorporate by reference in this prospectus supplement and the accompanying prospectus will automatically update and supersede this information. We incorporate by reference the documents listed below and any future filings (other than current reports furnished under Item 2.02 or Item 7.01 of Form 8-K and exhibits filed on such form that are related to such items) we make with the SEC under Sections 13(a), 13(c), 14 or 15(d) of the Securities Exchange Act of 1934, as amended, after the date of the prospectus supplement and prior to the termination of the offering of the common stock covered by this prospectus supplement (Commission File No. 000-50549):

- our Annual Report on Form 10-K for the year ended December 31, 2015 filed with the SEC on March 15, 2016;
- the information specifically incorporated by reference into our Annual Report on Form 10-K for the year ended December 31, 2015 from our Definitive Proxy Statement on Schedule 14A filed with the SEC on March 28, 2016;
- our Quarterly Reports on Form 10-Q for the quarterly periods ended March 31, 2016 and June 30, 2016, filed with the SEC on May 10, 2016 and August 9, 2016, respectively;
- our Current Reports on Form 8-K filed with the SEC on January 13, 2016, February 19, 2016, May 9, 2016, June 22, 2016, September 1, 2016 and September 8, 2016; and
- the description of our common stock contained in our registration statement on Form 8-A filed with the Securities and Exchange Commission on January 13, 2004, including all amendments and reports filed for the purpose of updating such information.

We will furnish without charge to you, upon written or oral request, a copy of any or all of the documents incorporated by reference, including exhibits to these documents. You should direct any requests for documents to GTx, Inc., Attention: Corporate Secretary, 175 Toyota Plaza, Suite 700, Memphis, Tennessee 38103. Our phone number is (901) 523-9700.

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## PROSPECTUS



**\$150,000,000**  
**Common Stock**  
**Warrants**

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From time to time, we may offer up to \$150,000,000 of shares of our common stock and warrants to purchase our common stock, either individually or in combination. We may also offer common stock upon the exercise of warrants.

We will provide the specific terms of these offerings and securities in one or more supplements to this prospectus. We may also authorize one or more free writing prospectuses to be provided to you in connection with these offerings. The prospectus supplement and any related free writing prospectus may also add, update or change information contained in this prospectus. You should carefully read this prospectus, the applicable prospectus supplement and any related free writing prospectus, as well as any documents incorporated by reference, before you buy any of the securities being offered.

Our common stock is listed on The NASDAQ Global Market under the trading symbol "GTXI." On May 9, 2014, the last reported sale price of our common stock was \$1.38 per share. The applicable prospectus supplement will contain information, where applicable, as to other listings, if any, on The NASDAQ Global Market or other securities exchange of the securities covered by the prospectus supplement.

**Investing in our securities involves a high degree of risk. You should review carefully the risks and uncertainties described under the heading “Risk Factors” contained in the applicable prospectus supplement and in any free writing prospectuses we have authorized for use in connection with a specific offering, and under similar headings in the documents that are incorporated by reference into this prospectus.**

**This prospectus may not be used to consummate a sale of securities unless accompanied by a prospectus supplement.**

The securities may be sold directly by us to investors, through agents designated from time to time or to or through underwriters or dealers, on a continuous or delayed basis. For additional information on the methods of sale, you should refer to the section entitled “Plan of Distribution” in this prospectus. If any agents or underwriters are involved in the sale of any securities with respect to which this prospectus is being delivered, the names of such agents or underwriters and any applicable fees, commissions, discounts and over-allotment options will be set forth in a prospectus supplement. The price to the public of such securities and the net proceeds we expect to receive from such sale will also be set forth in a prospectus supplement.

As of May 8, 2014, the aggregate market value of our outstanding common stock held by non-affiliates was approximately \$46,645,849, based on 75,161,437 shares of outstanding common stock, of which approximately 35,607,518 shares were held by non-affiliates, and a price of \$1.31 per share, which was the last reported sale price of our common stock on The NASDAQ Global Market on May 8, 2014. As of the date of this prospectus, we have not offered any securities pursuant to General Instruction I.B.6. of Form S-3 during the prior 12 calendar month period that ends on, and includes, the date of this prospectus.

**Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or determined if this prospectus is truthful or complete. Any representation to the contrary is a criminal offense.**

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The date of this prospectus is May 23, 2014.

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## ABOUT THIS PROSPECTUS

This prospectus is part of a registration statement on Form S-3 that we filed with the Securities and Exchange Commission, or SEC, using a “shelf” registration process. Under this shelf registration statement, we may, from time to time, offer and sell, in one or more offerings, any combination of the securities described in this prospectus for total gross proceeds of up to \$150,000,000. This prospectus provides you with a general description of the securities we may offer.

Each time we offer securities under this prospectus, we will provide a prospectus supplement that will contain more specific information about the terms of that offering. We may also authorize one or more free writing prospectuses to be provided to you that may contain material information relating to these offerings. The prospectus supplement and any related free writing prospectus that we may authorize to be provided to you may also add, update or change any of the information contained in this prospectus or in the documents that we have incorporated by reference into this prospectus. We urge you to read carefully this prospectus, any applicable prospectus supplement and any free writing prospectuses we have authorized for use in connection with a specific offering, together with the information incorporated herein by reference as described under the heading “Incorporation by Reference,” before buying any of the securities being offered.

**This prospectus may not be used to consummate a sale of securities unless it is accompanied by a prospectus supplement.**

You should rely only on the information contained in, or incorporated by reference into, this prospectus and any applicable prospectus supplement, along with the information contained in any free writing prospectuses we have authorized for use in connection with a specific offering. We have not authorized anyone to provide you with different or additional information. This prospectus is an offer to sell only the securities offered hereby, but only under circumstances and in jurisdictions where it is lawful to do so.

The information appearing in this prospectus, any applicable prospectus supplement or any related free writing prospectus is accurate only as of the date on the front of the document and that any information we have incorporated by reference is accurate only as of the date of the document incorporated by reference, regardless of the time of delivery of this prospectus, any applicable prospectus supplement or any related free writing prospectus, or any sale of a security. Our business, financial condition, results of operations and prospects may have changed since those dates.

This prospectus incorporates by reference market data, industry statistics and other data that have been obtained from, or compiled from, information made available by third parties. We have not independently verified their data. This prospectus and the information incorporated herein by reference includes trademarks, service marks and trade names owned by us or other companies. All trademarks, service marks and trade names included or incorporated by reference into this prospectus, any applicable prospectus supplement or any related free writing prospectus are the property of their respective owners.

This prospectus contains summaries of certain provisions contained in some of the documents described herein, but reference is made to the actual documents for complete information. All of the summaries are qualified in their entirety by the actual documents. Copies of some of the documents referred to herein have been filed, will be filed or will be incorporated by reference as exhibits to the registration statement of which this prospectus is a part, and you may obtain copies of those documents as described below under the section entitled “Where You Can Find More Information.”

## PROSPECTUS SUMMARY

*This summary highlights selected information contained elsewhere in this prospectus or incorporated by reference in this prospectus, and does not contain all of the information that you need to consider in making your investment decision. You should carefully read the entire prospectus, the applicable prospectus supplement and any related free writing prospectus, including the risks of investing in our securities discussed under the heading “Risk Factors” contained in the applicable prospectus supplement and any related free writing prospectus, and under similar headings in the other documents that are incorporated by reference into this prospectus. You should also carefully read the information incorporated by reference into this prospectus, including our financial statements, and the exhibits to the registration statement of which this prospectus is a part. Unless otherwise mentioned or unless the context requires otherwise, all references in this prospectus to “GTx,” “the company,” “we,” “us,” “our” or similar references mean GTx, Inc.*

### GTx, Inc.

We are a biopharmaceutical company dedicated to the discovery, development and commercialization of small molecules for the treatment of cancer, including treatments for prostate and breast cancer, cancer supportive care, including prevention and treatment of cancer-related muscle wasting or cachexia, and other serious medical conditions.

We are developing selective androgen receptor modulators, or SARMs, a new class of drugs with the potential to prevent and treat muscle wasting in patients with cancer and other musculoskeletal wasting or muscle loss conditions, including chronic sarcopenia (age related muscle loss), as well as the potential to be used as a hormonal therapy for the treatment of metastatic breast cancer. Our lead SARM product candidate is enobosarm (GTx-024). Enobosarm is the generic name given to the compound by the USAN Council and the World Health Organization and is the first compound to receive the SARM stem in its name, recognizing enobosarm as the first in this new class of compounds.

Additionally, we are developing GTx-758 (Capesaris®), an oral nonsteroidal selective estrogen receptor alpha agonist, for secondary hormonal therapy in men with metastatic and nonmetastatic castration resistant prostate cancer, and, potentially, as a secondary hormonal treatment for advanced prostate cancer used in combination with androgen deprivation therapy.

We were originally incorporated under the name Genotherapeutics, Inc. in Tennessee in September 1997. We changed our name to GTx, Inc. in 2001, and we reincorporated in Delaware in 2003. Our principal executive office is located at 175 Toyota Plaza, 7th Floor, Memphis, TN 38103, and our telephone number is (901) 523-9700. Our website address is [www.gtxinc.com](http://www.gtxinc.com). Information found on, or accessible through, our website is not a part of, and is not incorporated into, this prospectus, and you should not consider it part of this prospectus or part of any prospectus supplement.

### The Securities We May Offer

We may offer shares of our common stock and warrants to purchase our common stock, either individually or in combination, with a total value of up to \$150,000,000 from time to time under this prospectus, together with any applicable prospectus supplement and any related free writing prospectus, at prices and on terms to be determined by market conditions at the time of any offering. We may also offer common stock upon the exercise of warrants. This prospectus provides you with a general description of the securities we may offer. Each time we offer securities under this prospectus, we will provide a prospectus supplement that will describe the specific amounts, prices and other important terms of the securities, including the aggregate offering price.

A prospectus supplement and any related free writing prospectus that we may authorize to be provided to you may also add, update or change any of the information contained in this prospectus or in the documents we have incorporated by reference into this prospectus. However, no prospectus supplement or free writing prospectus will offer a security that is not registered and described in this prospectus at the time of the effectiveness of the registration statement of which this prospectus is a part.

We may sell the securities directly to investors or to or through underwriters, dealers or agents. We, and our underwriters or agents, reserve the right to accept or reject all or part of any proposed purchase of securities. If we do offer securities to or through underwriters or agents, we will include in the applicable prospectus supplement:

- the names of those underwriters or agents;
- applicable fees, discounts and commissions to be paid to them;

- details regarding over-allotment options, if any; and
- the net proceeds to us.

**THIS PROSPECTUS MAY NOT BE USED TO CONSUMMATE A SALE OF ANY SECURITIES UNLESS ACCOMPANIED BY A PROSPECTUS SUPPLEMENT.**

*Common Stock.* We may issue shares of our common stock from time to time. The holders of our common stock are entitled to one vote for each share held of record on all matters submitted to a vote of stockholders. 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 our board of directors out of legally available funds. Upon our liquidation, dissolution or winding up, holders of our 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 our common stock.

*Warrants.* We may issue warrants for the purchase of common stock in one or more series. We may issue warrants independently or together with common stock, and the warrants may be attached to or separate from the common stock. In this prospectus, we have summarized certain general features of the warrants. We urge you, however, to read the applicable prospectus supplement (and any free writing prospectus that we may authorize to be provided to you) related to the particular series of warrants being offered, as well as the form of warrant and/or the warrant agreement and warrant certificate, as applicable, that contain the terms of the warrants. A form of warrant agreement and warrant certificate containing the terms of the warrants that may be offered has been filed as an exhibit to the registration statement of which this prospectus is a part. We will file as exhibits to the registration statement of which this prospectus is a part, or will incorporate by reference from reports that we file with the SEC, the form of warrant and/or the warrant agreement and warrant certificate, as applicable, that describe the terms of the particular series of warrants we are offering, and any supplemental agreements, before the issuance of such warrants.

Warrants may be issued under a warrant agreement that we enter into with a warrant agent. We will indicate the name and address of the warrant agent, if any, in the applicable prospectus supplement relating to a particular series of warrants.

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**RISK FACTORS**

Investing in our securities involves a high degree of risk. Before deciding whether to invest in our securities, you should consider carefully the risks and uncertainties described under the heading “Risk Factors” contained in the applicable prospectus supplement and any related free writing prospectus, and discussed under the section entitled “Risk Factors” contained in our most recent annual report on Form 10-K and in our most recent quarterly report on Form 10-Q, as well as any amendments thereto reflected in subsequent filings with the SEC, which are incorporated by reference into this prospectus in their entirety, together with other information in this prospectus, the documents incorporated by reference and any free writing prospectus that we may authorize for use in connection with a specific offering. The risks described in these documents are not the only ones we face, but those that we consider to be material. There may be other unknown or unpredictable economic, business, competitive, regulatory or other factors that could have material adverse effects on our future results. Past financial performance may not be a reliable indicator of future performance, and historical trends should not be used to anticipate results or trends in future periods. If any of these risks actually occurs, our business, financial condition or results of operations could be seriously harmed. This could cause the trading price of our securities to decline, resulting in a loss of all or part of your investment. Please also read carefully the section below entitled “Special Note Regarding Forward-Looking Statements.”

**SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS**

This prospectus and the documents incorporated by reference contain forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, or the Securities Act, and Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act. These statements are based on our management’s beliefs and assumptions and on information currently available to us. Discussions containing these forward-looking statements may be found, among other places, in the sections entitled “Business,” “Risk Factors” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations” incorporated by reference from our most recent annual report on Form 10-K and in our most recent quarterly report on Form 10-Q, as well as any amendments thereto reflected in subsequent filings with the SEC. All statements, other than statements of historical facts, are forward-looking statements for purposes of these provisions, including, without limitation, any statements relating to:

- the implementation of our business strategies, including our ability to preserve or realize any significant value from our enobosarm (GTx-024) and GTx-758 (Capesaris®) programs;
- the therapeutic and commercial potential of our product candidates;
- the timing of regulatory discussions and submissions, and the anticipated timing, scope and outcome of related regulatory actions or guidance;
- our ability to establish and maintain potential new collaborative, partnering or other strategic arrangements for the development and commercialization of our product candidates;
- the anticipated progress of our clinical programs, including whether our ongoing clinical trials will achieve clinically relevant results;
- the timing, scope and anticipated initiation, enrollment and completion of our ongoing and planned clinical trials and any other future clinical trials that we may conduct;
- our ability to obtain and maintain regulatory approvals of our product candidates and any related restrictions, limitations, and/or warnings in the label of an approved product candidate;
- our ability to market, commercialize and achieve market acceptance for our product candidates;

- our ability to protect our intellectual property and operate our business without infringing upon the intellectual property rights of others;
- our estimates regarding the sufficiency of our cash resources, expenses, capital requirements and needs for additional financing, and our ability to obtain additional financing;
- our projected financial performance; and

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- our intended use of the net proceeds from offerings of our securities under this prospectus.

In some cases, you can identify forward-looking statements by terms such as “anticipate,” “believe,” “could,” “estimate,” “expect,” “intend,” “may,” “plan,” “potential,” “predict,” “project,” “should,” “will,” “would” and similar expressions intended to identify forward-looking statements. These statements involve known and unknown risks, uncertainties and other factors that may cause our actual results, levels of activity, performance, time frames or achievements to be materially different from the information expressed or implied by these forward-looking statements. While we believe that we have a reasonable basis for each forward-looking statement, we caution you that these statements are based on a combination of facts and factors currently known by us and our projections of the future, about which we cannot be certain. We discuss many of these risks, uncertainties and other factors in greater detail under the heading “Risk Factors” contained in any applicable prospectus supplement, in any free writing prospectuses we authorize for use in connection with a specific offering, and in our most recent annual report on Form 10-K and in our most recent quarterly report on Form 10-Q, as well as any amendments thereto reflected in subsequent filings with the SEC. Given these risks, uncertainties and other factors, you should not place undue reliance on these forward-looking statements. Also, these forward-looking statements represent our estimates and assumptions only as of the date such forward-looking statements are made. You should carefully read this prospectus, any applicable prospectus supplement and any free writing prospectuses we authorize for use in connection with a specific offering, together with the information incorporated herein by reference as described under the heading “Incorporation by Reference,” completely and with the understanding that our actual future results may be materially different from what we expect. We can give no assurances that any of the events anticipated by the forward-looking statements will occur or, if any of them do, what impact they will have on our business, results of operations and financial condition. We hereby qualify all of our forward-looking statements by these cautionary statements.

Except as required by law, we assume no obligation to update these forward-looking statements publicly, or to update the reasons actual results could differ materially from those anticipated in these forward-looking statements, even if new information becomes available in the future.

### **USE OF PROCEEDS**

Except as described in any applicable prospectus supplement or in any free writing prospectuses we have authorized for use in connection with a specific offering, we currently anticipate using the net proceeds from the sale of securities under this prospectus, if any, for clinical development and other research and development activities and for working capital and general corporate purposes. As of the date of this prospectus, we cannot specify with certainty all of the particular uses of the proceeds from the sale of the securities under this prospectus. Accordingly, we will retain broad discretion over the use of such proceeds. Pending these uses, we intend to invest the net proceeds in investment-grade, interest-bearing instruments.

### **DESCRIPTION OF CAPITAL STOCK**

#### **General**

As of the date of this prospectus, our authorized capital stock consists of 200,000,000 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 May 8, 2014, there were 75,161,437 shares of our common stock outstanding and no shares of preferred stock outstanding.

The following summary description of our capital stock is based on the provisions of our certificate of incorporation and bylaws, the applicable provisions of the Delaware General Corporation Law and the agreements described below. This information may not be complete in all respects and is qualified entirely by reference to the provisions of our certificate of incorporation and bylaws, the Delaware General Corporation Law and such agreements. For information on how to obtain copies of our certificate of incorporation, bylaws and such agreements, which are exhibits to the registration statement of which this prospectus is a part, see “Where You Can Find More Information.”

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### **Common Stock**

The holders of our 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 our 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 our board of directors out of legally available funds. Upon our liquidation, dissolution or winding up, holders of our 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 our common stock.

The rights of the holders of our common stock are subject to, and may be adversely affected by, the rights of holders of shares of any preferred stock that we may designate and issue in the future.

### **Preferred Stock**

Our certificate of incorporation provides that our board of directors has the authority, without further action by the stockholders (unless such stockholder action is required by applicable law or NASDAQ rules), 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, to fix the designations, voting powers, preferences and rights of the shares of each wholly unissued series, and any qualifications, limitations or restrictions thereon, 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. Our 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 the 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 our common stock and the voting and other rights of the holders of our common stock.

## Registration Rights

In March 2014, we completed a private placement of 11,976,048 shares of our common stock and warrants to purchase 10,179,642 shares of our common stock. Pursuant to the terms of a registration rights agreement we entered into in connection with the private placement, we agreed to file a registration statement under the Securities Act registering the resale of the 11,976,048 shares of common stock we issued to the investors in the private placement, which include J.R. Hyde, III, our largest stockholder, as well as the 10,179,642 shares of common stock underlying the warrants we issued to those investors. In addition, if we propose to register any of our securities under the Securities Act, either for our own account or for the account of others, the investors in the private placement are entitled to notice of the registration and are entitled to include, at our expense, their shares of common stock in the registration and any related underwriting, provided, among other conditions, that the underwriters may limit the number of shares to be included in the registration. Moreover, J.R. Hyde, III and certain of his affiliates, have rights under a separate registration rights agreement with us to require us to file resale registration statements covering an additional 7,852,979 shares of common stock held in the aggregate or to include these shares in registration statements that we may file for ourselves or other stockholders. If Mr. Hyde or his affiliates or any of our other significant stockholders, including the other investor in our March 2014 private placement, were to sell large blocks of shares in a short period of time, the market price of our common stock could drop substantially. The foregoing registration rights do not apply or have been waived with respect to the registration statement of which this prospectus is a part, and no shares held by or issuable to the foregoing persons are registered for resale hereunder.

## Anti-Takeover Effects of Provisions of Delaware Law and Our Charter Documents

*Delaware Takeover Statute.* We are subject to Section 203 of the Delaware General Corporation Law. Section 203 generally prohibits a public Delaware corporation such as us 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:

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- 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.* Our certificate of incorporation and bylaws provide that our 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, our 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 our 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 our stockholders may be called only by the chairman of our board of directors, our chief executive officer or our board of directors pursuant to a resolution adopted by a majority of the total number of authorized directors.

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The Delaware General Corporation Law 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. Our 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 our capital stock entitled to vote generally in the election of directors.

The provisions described in the preceding paragraph that are included in our certificate of incorporation may only be amended or repealed by the affirmative vote of a majority of our directors and the affirmative vote of the holders of at least 66-2/3% of the voting power of all then-outstanding shares of our capital stock entitled to vote generally in the election of directors.

These and other provisions contained in our certificate of incorporation and bylaws could delay or discourage some types of transactions involving an actual or potential change in our control or change in our 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 our common stock.

## **Transfer Agent and Registrar**

The transfer agent and registrar for our common stock is Computershare Trust Company, N.A. Its address is 250 Royall Street, Canton, MA 02021.

## **DESCRIPTION OF WARRANTS**

The following description, together with the additional information that we include in any applicable prospectus supplement and in any related free writing prospectus that we may authorize to be distributed to you, summarizes the material terms and provisions of the warrants that we may offer under this prospectus. While the terms we have summarized below will apply generally to any warrants that we may offer under this prospectus, we will describe the particular terms of any series of warrants in more detail in the applicable prospectus supplement. The following description of warrants will apply to the warrants offered under this prospectus unless we provide otherwise in the applicable prospectus supplement. The applicable prospectus supplement for a particular series of warrants may specify different or additional terms.

We have filed a form of warrant agreement and warrant certificate containing the terms of the warrants that may be offered as an exhibit to the registration statement of which this prospectus is a part. We will file as exhibits to the registration statement of which this prospectus is a part, or will incorporate by reference from reports that we file with the SEC, the form of warrant and/or the warrant agreement and warrant certificate, as applicable, that describe the terms of the particular series of warrants we are offering, and any supplemental agreements, before the issuance of such warrants. The following summaries of material terms and provisions of the warrants are subject to, and qualified in their entirety by reference to, all the provisions of the form of warrant and/or the warrant agreement and warrant certificate, as applicable, and any supplemental agreements applicable to a particular series of warrants. We urge you to read the applicable prospectus supplement related to the particular series of warrants that we may offer under this prospectus, as well as any related free writing prospectus, and the form of warrant and/or the warrant agreement and warrant certificate, as applicable, and any supplemental agreements, that contain the terms of the warrants.

## **General**

The warrants may be issued independently or together with any common stock, and the warrants may be attached to or separate from the common stock. The warrants may be issued under a warrant agreement that we enter

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into with a warrant agent, all as shall be set forth in a prospectus supplement relating to the particular series of warrants being offered pursuant to this prospectus and such prospectus supplement.

We will describe in the applicable prospectus supplement the terms of the particular series of warrants being offered, including:

- the offering price and aggregate number of warrants offered;
- the currency for which the warrants may be purchased;
- if applicable, the number of warrants issued with each share of common stock;
- if applicable, the date on and after which the warrants and the related common stock will be separately transferable;



- the number of shares of common stock purchasable upon the exercise of one warrant and the price at which these shares may be purchased upon such exercise;
- the effect of any merger, consolidation, sale or other disposition of our business on the warrants;
- the terms of any rights to redeem or call the warrants;
- any provisions for changes to or adjustments in the exercise price or number of shares of common stock issuable upon exercise of the warrants;
- the dates on which the right to exercise the warrants will commence and expire;
- the manner in which the warrants may be modified;
- a discussion of any material or special United States federal income tax consequences of holding or exercising the warrants; and
- any other specific terms, preferences, rights or limitations of, or restrictions on, the warrants.

Before exercising their warrants, holders of warrants will not have any of the rights of holders of our common stock, including the right to receive dividends, if any, or payments upon our liquidation, dissolution or winding up or to exercise voting rights, if any. Accordingly, holders of warrants will not be entitled, by virtue of being such holders, to vote, consent, receive dividends, receive notices as stockholders with respect to any meeting of stockholders for the election of our directors or any other matter, or to exercise any rights whatsoever as our stockholders.

### **Exercise of Warrants**

Each warrant will entitle the holder to purchase shares of our common stock at such exercise price as will in each case be set forth in, or be determinable as set forth in, the applicable prospectus supplement relating to the warrants offered thereby. The warrants may be exercised as set forth in the applicable prospectus supplement relating to the warrants offered. Unless we otherwise specify in the applicable prospectus supplement, warrants may be exercised at any time up to the close of business on the expiration date set forth in the prospectus supplement relating to the warrants offered thereby. After the close of business on the expiration date, unexercised warrants will become void.

Upon receipt of payment and the warrant or warrant certificate, as applicable, properly completed and duly executed at the corporate trust office of the warrant agent, if any, or any other office, including ours, indicated in the prospectus supplement, we will, as soon as practicable, issue and deliver the common stock purchasable upon such exercise. If less than all of the warrants (or the warrants represented by such warrant certificate) are exercised, a new warrant or a new warrant certificate, as applicable, will be issued for the remaining warrants.

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### **Governing Law**

Unless we otherwise specify in the applicable prospectus supplement, the warrants will be governed by and construed in accordance with the laws of the State of New York.

### **Enforceability of Rights by Holders of Warrants**

Each warrant agent, if any, will act solely as our agent under the applicable warrant agreement and will not assume any obligation or relationship of agency or trust with any holder of any warrant. A single bank or trust company may act as warrant agent for more than one issue of warrants. A warrant agent will have no duty or responsibility in case of any default by us under the applicable warrant agreement or warrant, including any duty or responsibility to initiate any proceedings at law or otherwise, or to make any demand upon us. Any holder of a warrant may, without the consent of the related warrant agent or the holder of any other warrant, enforce by appropriate legal action its right to exercise, and receive the common stock purchasable upon exercise of, its warrants.

### **Outstanding Warrants**

As of May 8, 2014, we had outstanding warrants to purchase an aggregate of 10,179,642 shares of our common stock. These warrants, which have a one year term expiring on March 6, 2015, have a per share exercise price of \$1.67 that is payable only in cash.

### **PLAN OF DISTRIBUTION**

We may sell the securities from time to time pursuant to underwritten public offerings, negotiated transactions, block trades or a combination of these methods. We may sell the securities to or through underwriters or dealers, through agents, or directly to one or more purchasers. A prospectus supplement or supplements (and any related free writing prospectus that we may authorize to be provided to you) will describe the terms of the offering of the securities, including, to the extent applicable:

- the name or names of any underwriters or agents, if any;
- the purchase price of the securities and the proceeds we will receive from the sale;
- any over-allotment options under which underwriters may purchase additional securities from us;
- any agency fees or underwriting discounts and other items constituting agents' or underwriters' compensation;
- any public offering price;

- any discounts or concessions allowed or reallocated or paid to dealers; and
- any securities exchange or market on which the securities may be listed.

Only underwriters named in the prospectus supplement are underwriters of the securities offered by the prospectus supplement.

If underwriters are used in the sale, they will acquire the securities for their own account and may resell the securities from time to time in one or more transactions at a fixed public offering price or at varying prices determined at the time of sale. The obligations of the underwriters to purchase the securities will be subject to the conditions set forth in the applicable underwriting agreement. We may offer the securities to the public through underwriting syndicates represented by managing underwriters or by underwriters without a syndicate. Subject to certain conditions, the underwriters will be obligated to purchase all of the securities offered by the prospectus supplement. Any public offering price and any discounts or concessions allowed or reallocated or paid to dealers may change from time to time. We may use underwriters with whom we have a material relationship. We will describe in the prospectus supplement, naming the underwriter, the nature of any such relationship.

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We may sell securities directly or through agents we designate from time to time, including in “at-the-market” offerings or otherwise. We will name any agent involved in the offering and sale of securities and we will describe any commissions we will pay the agent in the prospectus supplement. Unless the prospectus supplement states otherwise, our agent will act on a best-efforts basis for the period of its appointment.

We may authorize agents or underwriters to solicit offers by certain types of institutional investors to purchase securities from us at the public offering price set forth in the prospectus supplement pursuant to delayed delivery contracts providing for payment and delivery on a specified date in the future. We will describe the conditions to these contracts and the commissions we must pay for solicitation of these contracts in the prospectus supplement.

We may provide agents and underwriters with indemnification against civil liabilities, including liabilities under the Securities Act, or contribution with respect to payments that the agents or underwriters may make with respect to these liabilities. Agents and underwriters may engage in transactions with, or perform services for, us in the ordinary course of business.

Any underwriter may engage in overallotment, stabilizing transactions, short covering transactions and penalty bids in accordance with Regulation M under the Exchange Act. Overallotment involves sales in excess of the offering size, which create a short position. Stabilizing transactions permit bids to purchase the underlying security so long as the stabilizing bids do not exceed a specified maximum. Short covering transactions involve purchases of the securities in the open market after the distribution is completed to cover short positions. Penalty bids permit the underwriters to reclaim a selling concession from a dealer when the securities originally sold by the dealer are purchased in a covering transaction to cover short positions. Those activities may cause the price of the securities to be higher than it would otherwise be. If commenced, the underwriters may discontinue any of the activities at any time.

Any underwriters that are qualified market makers on the NASDAQ Global Market may engage in passive market making transactions in the securities on the NASDAQ Global Market in accordance with Regulation M, during the business day prior to the pricing of the offering, before the commencement of offers or sales of the securities. Passive market makers must comply with applicable volume and price limitations and must be identified as passive market makers. In general, a passive market maker must display its bid at a price not in excess of the highest independent bid for such security; if all independent bids are lowered below the passive market maker’s bid, however, the passive market maker’s bid must then be lowered when certain purchase limits are exceeded.

In compliance with guidelines of the Financial Industry Regulatory Authority, or FINRA, the maximum consideration or discount to be received by any FINRA member or independent broker dealer may not exceed 8% of the aggregate amount of the securities offered pursuant to this prospectus and any applicable prospectus supplement.

## **LEGAL MATTERS**

Unless otherwise indicated in the applicable prospectus supplement, the validity of the securities offered by this prospectus, and any supplement thereto, will be passed upon for us by Cooley LLP, Palo Alto, California.

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## **EXPERTS**

Ernst & Young LLP, independent registered public accounting firm, has audited our financial statements included in our Annual Report on Form 10-K for the year ended December 31, 2013, and the effectiveness of our internal control over financial reporting as of December 31, 2013, as set forth in their reports, which are incorporated by reference in this prospectus and elsewhere in the registration statement. Our financial statements are incorporated by reference in reliance on Ernst & Young LLP’s reports, given on their authority as experts in accounting and auditing.

## **WHERE YOU CAN FIND MORE INFORMATION**

We are a reporting company and file annual, quarterly and current reports, proxy statements and other information with the SEC. We have filed with the SEC a registration statement on Form S-3 under the Securities Act with respect to the securities we are offering under this prospectus. This prospectus does not contain all of the information set forth in the registration statement and the exhibits to the registration statement. For further information with respect to us and the securities we are offering under this prospectus, we refer you to the registration statement and the exhibits filed as a part of the registration statement. You may read and copy the registration statement, as well as our reports, proxy statements and other information, at the SEC’s Public Reference Room at 100 F Street, N.E., Washington, D.C. 20549. Please call the SEC at 1-800-SEC-0330 for more information about the operation of the public reference room. The SEC also maintains an Internet site that contains reports, proxy and information statements and other information regarding issuers that file electronically

with the SEC, including GTx. The SEC's Internet site can be found at [www.sec.gov](http://www.sec.gov). We maintain a website at [www.gtxinc.com](http://www.gtxinc.com). Information found on, or accessible through, our website is not a part of, and is not incorporated into, this prospectus, and you should not consider it part of this prospectus or part of any prospectus supplement.

## INCORPORATION BY REFERENCE

The SEC allows us to incorporate by reference the information we file with it, which means that we can disclose important information to you by referring you to another document that we have filed separately with the SEC. You should read the information incorporated by reference because it is an important part of this prospectus. Information in this prospectus supersedes information incorporated by reference that we filed with the SEC prior to the date of this prospectus, while information that we file later with the SEC will automatically update and supersede the information in this prospectus. We incorporate by reference into this prospectus and the registration statement of which this prospectus is a part the information or documents listed below that we have filed with the SEC (Commission File No. 000-50549):

- our Annual Report on Form 10-K for the fiscal year ended December 31, 2013, filed with the SEC on March 12, 2014;
- the information specifically incorporated by reference into our Annual Report on Form 10-K for the fiscal year ended December 31, 2013 from our definitive proxy statement on Schedule 14A for our 2014 Annual Meeting of Stockholders, filed with the SEC on March 24, 2014;
- our Quarterly Report on Form 10-Q for the quarter ended March 31, 2014, filed with the SEC on May 12, 2014;
- our Current Reports on Form 8-K, filed with the SEC on January 29, 2014, March 4, 2014 (except for the information furnished under Item 2.02 thereof and the accompanying exhibit 99.1), March 6, 2014, April 4, 2014, April 15, 2014 and May 9, 2014; and
- the description of our common stock set forth in our registration statement on Form 8-A, filed with the SEC on January 13, 2004, including any further amendments thereto or reports filed for the purposes of updating this description.

We also incorporate by reference any future filings (other than current reports furnished under Item 2.02 or Item 7.01 of Form 8-K and exhibits filed on such form that are related to such items unless such Form 8-K expressly provides to the contrary) made with the SEC pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act, including those made after the date of the initial filing of the registration statement of which this prospectus is a part

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and prior to effectiveness of such registration statement, until we file a post-effective amendment that indicates the termination of the offering of the securities made by this prospectus and will become a part of this prospectus from the date that such documents are filed with the SEC. Information in such future filings updates and supplements the information provided in this prospectus. Any statements in any such future filings will automatically be deemed to modify and supersede any information in any document we previously filed with the SEC that is incorporated or deemed to be incorporated herein by reference to the extent that statements in the later filed document modify or replace such earlier statements.

We will furnish without charge to each person, including any beneficial owner, to whom a prospectus is delivered, upon written or oral request, a copy of any or all of the documents incorporated by reference into this prospectus but not delivered with the prospectus, including exhibits that are specifically incorporated by reference into such documents. You should direct any requests for documents to GTx, Inc., Attention: Corporate Secretary, 175 Toyota Plaza, 7th Floor, Memphis, TN 38103. Our phone number is (901) 523-9700.

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**17,283,947 Shares**



**Common Stock**

**Prospectus Supplement**

October 11, 2016

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