

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

SCHEDULE 13G

Under the Securities Exchange Act of 1934

(Amendment No. __)*

GTx, Inc.

(Name of Issuer)

Common Stock, par value \$0.001 per share

(Title of Class of Securities)

40052B 20 7

(CUSIP Number)

September 29, 2017

(Date of Event which Requires Filing of this Statement)

Check the appropriate box to designate the rule pursuant to which this Schedule is filed.

- ☐ Rule 13d-1(b)
☒ Rule 13d-1(c)
☐ Rule 13d-1(d)

*The remainder of this cover page shall be filled out for a reporting person's initial filing on this form with respect to the subject class of securities, and for any subsequent amendment containing information which would alter disclosures provided in a prior cover page.

The information required on the remainder of this cover page shall not be deemed to be "filed" for the purpose of Section 18 of the Securities Exchange Act of 1934 ("Act") or otherwise subject to the liabilities of that section of the Act but shall be subject to all other provisions of the Act (however, see the Notes).

1	NAME OF REPORTING PERSON OR I.R.S. IDENTIFICATION NO. OF ABOVE PERSON Aisling Capital IV, LP		
2	CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP <div>(a) <input type="radio"/></div> <div>(b) <input checked="" type="checkbox"/></div>		
3	SEC USE ONLY		
4	CITIZENSHIP OR PLACE OF ORGANIZATION Delaware		
NUMBER OF SHARES BENEFICIALLY OWNED BY EACH REPORTING PERSON WITH	5	SOLE VOTING POWER 1,356,697	
	6	SHARED VOTING POWER 0	
	7	SOLE DISPOSITIVE POWER 1,356,697	
	8	SHARED DISPOSITIVE POWER 0	
9	AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON 1,356,697 (See Item 4)		
10	CHECK BOX IF THE AGGREGATE AMOUNT IN ROW (9) EXCLUDES CERTAIN SHARES <div>o</div>		
11	PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (9) 6.2%		
12	TYPE OF REPORTING PERSON PN		

1	NAME OF REPORTING PERSON OR I.R.S. IDENTIFICATION NO. OF ABOVE PERSON Aisling Capital Partners IV, LP		
2	CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP <div>(a) <input type="radio"/></div> <div>(b) <input checked="" type="checkbox"/></div>		
3	SEC USE ONLY		
4	CITIZENSHIP OR PLACE OF ORGANIZATION Delaware		
NUMBER OF SHARES BENEFICIALLY OWNED BY EACH REPORTING PERSON WITH	5	SOLE VOTING POWER 1,356,697	
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10	CHECK BOX IF THE AGGREGATE AMOUNT IN ROW (9) EXCLUDES CERTAIN SHARES <div>o</div>		
11	PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (9) 6.2%		
12	TYPE OF REPORTING PERSON PN		

1	NAME OF REPORTING PERSON OR I.R.S. IDENTIFICATION NO. OF ABOVE PERSON Aisling Capital Partners IV LLC		
2	CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP (a) <input type="radio"/> (b) <input checked="" type="checkbox"/>		
3	SEC USE ONLY		
4	CITIZENSHIP OR PLACE OF ORGANIZATION Delaware		
NUMBER OF SHARES BENEFICIALLY OWNED BY EACH REPORTING PERSON WITH	5	SOLE VOTING POWER 1,356,697	
	6	SHARED VOTING POWER 0	
	7	SOLE DISPOSITIVE POWER 1,356,697	
	8	SHARED DISPOSITIVE POWER 0	
9	AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON 1,356,697 (See Item 4)		
10	CHECK BOX IF THE AGGREGATE AMOUNT IN ROW (9) EXCLUDES CERTAIN SHARES <input type="radio"/>		
11	PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (9) 6.2%		
12	TYPE OF REPORTING PERSON OO		

1	NAME OF REPORTING PERSON OR I.R.S. IDENTIFICATION NO. OF ABOVE PERSON Steve Elms		
2	CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP (a) <input type="radio"/> (b) <input checked="" type="checkbox"/>		
3	SEC USE ONLY		
4	CITIZENSHIP OR PLACE OF ORGANIZATION United States		
NUMBER OF SHARES BENEFICIALLY OWNED BY EACH REPORTING PERSON WITH	5	SOLE VOTING POWER 0	
	6	SHARED VOTING POWER 1,356,697	
	7	SOLE DISPOSITIVE POWER 0	
	8	SHARED DISPOSITIVE POWER 1,356,697	
9	AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON 1,356,697 (See Item 4)		
10	CHECK BOX IF THE AGGREGATE AMOUNT IN ROW (9) EXCLUDES CERTAIN SHARES <input type="radio"/>		
11	PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (9) 6.2%		
12	TYPE OF REPORTING PERSON IN		

1	NAME OF REPORTING PERSON OR I.R.S. IDENTIFICATION NO. OF ABOVE PERSON Andrew Schiff		
2	CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP (a) <input type="radio"/> (b) <input checked="" type="checkbox"/>		
3	SEC USE ONLY		
4	CITIZENSHIP OR PLACE OF ORGANIZATION United States		
NUMBER OF SHARES BENEFICIALLY OWNED BY EACH REPORTING PERSON WITH	5	SOLE VOTING POWER 0	
	6	SHARED VOTING POWER 1,356,697	
	7	SOLE DISPOSITIVE POWER 0	
	8	SHARED DISPOSITIVE POWER 1,356,697	
9	AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON 1,356,697 (See Item 4)		
10	CHECK BOX IF THE AGGREGATE AMOUNT IN ROW (9) EXCLUDES CERTAIN SHARES <input type="radio"/>		
11	PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (9) 6.2%		
12	TYPE OF REPORTING PERSON IN		

- ITEM 1.**
- (a) Name of Issuer:
- GTx, Inc. (the "Issuer")
- (b) Address of Issuer's Principal Executive Offices:
- 175 Toyota Plaza, 7th Floor, Memphis, Tennessee 38103

- ITEM 2.**
- (a) Name of Person Filing:
- This Schedule 13G (this "Statement") is being filed by the following persons (collectively, the "Reporting Persons"):
- (i) Aisling Capital IV, LP, a Delaware limited partnership ("Aisling");
- (ii) Aisling Capital Partners IV, LP, a Delaware limited partnership ("Aisling Partners"), a general partner of Aisling;
- (iii) Aisling Capital Partners IV LLC, a Delaware limited liability company ("Aisling Partners GP"), a general partner of Aisling Partners;
- (iv) Mr. Steve Elms, a managing member of Aisling Partners GP;
- (v) Mr. Andrew Schiff, a managing member of Aisling Partners GP.
- (b) Address of Principal Business Office, or if None, Residence:
- The address of the principal business offices of each of the Reporting Persons is 888 Seventh Avenue, 12th Floor, New York, New York 10106.
- (c) Citizenship:
- (i) Aisling - a Delaware limited partnership
- (ii) Aisling Partners - a Delaware limited partnership
- (iii) Aisling Partners GP - a Delaware limited liability company
- (iv) Mr. Elms - United States
- (v) Mr. Schiff - United States
- (d) Title of Class of Securities:
- Common Stock, par value \$0.001 per share (the "Common Stock").
- (e) CUSIP Number:
- 40052B 20 7

ITEM 3. IF THIS STATEMENT IS FILED PURSUANT TO §240.13D-1(B) OR 240.13D-2(B) OR (C), CHECK WHETHER THE PERSON FILING IS A:

- (a) ☐ Broker or dealer registered under Section 15 of the Act (15 U.S.C. 78o)
- (b) ☐ Bank as defined in Section 3(a)(6) of the Act (15 U.S.C. 78c)
- (c) ☐ Insurance company as defined in Section 3(a)(19) of the Act (15 U.S.C. 78c)
- (d) ☐ Investment company registered under Section 8 of the Investment Company Act of 1940 (15 U.S.C. 80a-8)
- (e) ☐ An investment adviser in accordance with §240.13d-1(b)(1)(ii)(E)
- (f) ☐ An employee benefit plan or endowment fund in accordance with §240.13d-1(b)(1)(ii)(F);
- (g) ☐ A Parent holding company or control person in accordance with §240.13d-1(b)(1)(ii)(G);
- (h) ☐ A savings association as defined in Section 3(b) of the Federal Deposit Insurance Act (12 U.S.C. 1813)
- (i) ☐ A church plan that is excluded from the definition of an investment company under section 3(c)(14) of the Investment Company Act of 1940 (15 U.S.C. 80a-3)
- (j) ☐ A non-U.S. institution in accordance with §240.13d-1(b)(1)(ii)(J);
- (k) ☐ Group, in accordance with §240.13d-1(b)(1)(ii)(J).
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ITEM 4. OWNERSHIP

(a) Amount beneficially owned:

Each of the Reporting Persons may be deemed to beneficially own an aggregate of 1,356,697 shares of Common Stock, which includes 508,761 shares of Common Stock issuable upon the exercise of warrants.

(b) Percent of class:

Based on the calculations made in accordance with Rule 13d-3(d), each of the Reporting Persons may be deemed to beneficially own approximately 6.2% of the outstanding Common Stock as of the date hereof.

All percentages of ownership of the Common Stock by Reporting Persons presented in this Statement are based on 22,050,670 shares of Common Stock outstanding as of September 29, 2017, which includes 16,058,589 shares of Common Stock outstanding as of September 25, 2017, as represented by the Issuer in the Securities Purchase Agreement filed as Exhibit 10.1 to the Issuer's Current Report on Form 8-K filed with the SEC on September 29, 2017 (the "Securities Purchase Agreement"), an aggregate of 5,483,320 shares of Common Stock issued pursuant to the Securities Purchase Agreement, and assumes the issuance of 508,761 shares of Common Stock issuable upon the exercise of warrants beneficially owned by the Reporting Persons.

(c) Number of shares as to which such person has:

(i), (iii) Sole power to vote or to direct the vote/Sole power to dispose of or to direct the disposition of:

As of the date hereof, each of Aisling, Aisling Partners and Aisling Partners GP may be deemed to have sole power to direct the voting and disposition of the 1,356,697 shares of Common Stock beneficially owned by Aisling.

(ii), (iv) Shared power to vote or direct the vote/ Shared power to dispose of or to direct the disposition of:

By virtue of the relationships between and among the Reporting Persons as described in Item 2, each of Messrs. Elms and Schiff may be deemed to share the power to direct the voting and the disposition of the 1,356,697 shares of Common Stock beneficially owned by Aisling as of the date hereof.

ITEM 5. OWNERSHIP OF FIVE PERCENT OR LESS OF A CLASS.

Not Applicable.

If this statement is being filed to report the fact that as of the date hereof the reporting person has ceased to be the beneficial owner of more than five percent of the class of securities, check the following ☐.

ITEM 6. OWNERSHIP OF MORE THAN FIVE PERCENT ON BEHALF OF ANOTHER PERSON.

The partners of Aisling have the right to participate in the receipt of dividends from, or proceeds from the sale of, the Common Stock held for the account of Aisling in accordance with their ownership interests in Aisling.

ITEM 7. IDENTIFICATION AND CLASSIFICATION OF THE SUBSIDIARY WHICH ACQUIRED THE SECURITY BEING REPORTED ON BY THE PARENT HOLDING COMPANY.

Not Applicable.

ITEM 8. IDENTIFICATION AND CLASSIFICATION OF MEMBERS OF THE GROUP.

Not Applicable.

ITEM 9. NOTICE OF DISSOLUTION OF GROUP

Not Applicable.

ITEM 10. CERTIFICATIONS.

By signing below I hereby certify that, to the best of my knowledge and belief, the securities referred to above were not acquired and are not held for the purpose of or with the effect of changing or influencing the control of the issuer of the securities and were not acquired and are not held in connection with or as a participant in any transaction having that purpose or effect.

SIGNATURE

After reasonable inquiry and to the best of my knowledge and belief, I certify that the information set forth in this statement is true, complete and correct.

Dated: October 5, 2017

 AISLING CAPITAL IV, LP

By: Aisling Capital Partners IV, LP,
As its General Partner

By: Aisling Capital Partners IV LLC,
As its General Partner

By:
Name: Andrew Schiff
Title: Managing Member

/s/ Andrew Schiff

 AISLING CAPITAL PARTNERS IV, LP

By: Aisling Capital Partners IV LLC,
As its General Partner

By:
Name: Andrew Schiff
Title: Managing Member

/s/ Andrew Schiff

 AISLING CAPITAL PARTNERS IV LLC

By:
Name: Andrew Schiff
Title: Managing Member

/s/ Andrew Schiff

 STEVE ELMS

By: /s/ Steve Elms

 ANDREW SCHIFF

By: /s/ Andrew Schiff

EXHIBIT INDEX

Exhibit 1. Joint Filing Agreement as required by Rule 13d-1(k)(1) under the Securities Exchange Act of 1934, as amended.

EXHIBIT 1

JOINT FILING AGREEMENT

Each of the undersigned hereby acknowledges and agrees, in compliance with the provisions of Rule 13d-1(k)(1) promulgated under the Securities Exchange Act of 1934, as amended, that the Schedule 13G to which this Agreement is attached as an Exhibit, and any amendments thereto, will be filed with the Securities and Exchange Commission jointly on behalf of the undersigned. This Agreement may be executed in one or more counterparts.

Date: October 5, 2017

AISLING CAPITAL IV, LP

By: Aisling Capital Partners IV, LP,
As its General Partner

By: Aisling Capital Partners IV LLC,
As its General Partner

By: /s/ Andrew Schiff
Name: Andrew Schiff
Title: Managing Member

AISLING CAPITAL PARTNERS IV, LP

By: Aisling Capital Partners IV LLC,
As its General Partner

By: /s/ Andrew Schiff
Name: Andrew Schiff
Title: Managing Member

AISLING CAPITAL PARTNERS IV LLC

By: /s/ Andrew Schiff
Name: Andrew Schiff
Title: Managing Member

STEVE ELMS

By: /s/ Steve Elms

ANDREW SCHIFF

By: /s/ Andrew Schiff
