



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

**FORM S-8**

**REGISTRATION STATEMENT  
UNDER  
THE SECURITIES ACT OF 1933**

**GTx, Inc.**

(Exact name of registrant as specified in its charter)

**Delaware**  
(State or other jurisdiction of  
incorporation or organization)

**62-1715807**  
(I.R.S. Employer  
Identification No.)

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**3 N. Dunlap Street, 3rd Floor**  
**Van Vleet Building**  
**Memphis, TN 38163**  
**(901) 523-9700**

(Address of principal executive offices, including zip code)

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**Amended and Restated 2004 Non-Employee Directors' Stock Option Plan**  
(Full title of the plan)

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**Mitchell S. Steiner, M.D., F.A.C.S.**  
**Chief Executive Officer**  
**GTx, Inc.**  
**3 N. Dunlap Street, 3rd Floor**  
**Van Vleet Building**  
**Memphis, TN 38163**  
**(901) 523-9700**

(Name, address, including zip code, and telephone number, including area code, of agent for service)

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Copies to:  
**Suzanne Sawochka Hooper, Esq.**  
**Cooley Godward LLP**  
**Five Palo Alto Square**  
**3000 El Camino Real**  
**Palo Alto, CA 94306-2155**  
**(650) 843-5000**

**CALCULATION OF REGISTRATION FEE**

<b>Title of Securities to be Registered</b>	<b>Amount to be Registered (1)</b>	<b>Proposed Maximum Offering Price Per Share (2)</b>	<b>Proposed Maximum Aggregate Offering Price (2)</b>	<b>Amount of Registration Fee</b>
Common Stock, par value \$.001 per share	68,000 shares	\$8.57	\$582,760	\$62.36

- (1) Pursuant to Rule 416 promulgated under the Securities Act of 1933, as amended (the "Securities Act"), this Registration Statement shall also cover any additional shares of the Registrant's Common Stock that become issuable under the plan set forth herein by reason of any stock dividend, stock split, recapitalization or other similar transaction effected without receipt of consideration that increases the number of outstanding shares of the Registrant's Common Stock.
- (2) Estimated solely for the purpose of calculating the amount of the registration fee pursuant to Rule 457(h) promulgated under the Securities Act. The offering price per share and aggregate offering price are based upon the average of the high and low prices of the Registrant's Common Stock as reported on the NASDAQ Global Market on August 8, 2006, in accordance with Rule 457(c) of the Securities Act.

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**EXPLANATORY NOTE**

This Registration Statement on Form S-8 is being filed for the purpose of registering an additional 68,000 shares of the Registrant's Common Stock to be issued pursuant to the Registrant's Amended and Restated 2004 Non-Employee Directors' Stock Option Plan.

**INCORPORATION BY REFERENCE OF CONTENTS OF REGISTRATION STATEMENT ON FORM S-8**

The contents of the Registration Statement on Form S-8 (File No. 333-112576) are incorporated by reference herein.

**EXHIBITS**

<b>Exhibit Number</b>	<b>Description</b>
5.1	Opinion of Cooley Godward LLP
23.1	Consent of Ernst & Young LLP, Independent Registered Public Accounting Firm
23.2	Consent of Cooley Godward LLP is contained in Exhibit 5.1 to this Registration Statement
24.1	Power of Attorney (contained on the signature pages hereto)
99.1(1)	Amended and Restated 2004 Non-Employee Directors' Stock Option Plan
99.2(2)	Form of Stock Option Agreement under the Amended and Restated 2004 Non-Employee Directors' Stock Option Plan

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(1) Filed as Exhibit 10.1 to the Registrant's Current Report on Form 8-K (File No. 000-50549), filed with the SEC on April 27, 2006, and incorporated herein by reference.

(2) Filed as Exhibit 10.35 to the Registrant's Quarterly Report on Form 10-Q (File No. 000-50549), filed with the SEC on August 9, 2006, and incorporated herein by reference.

**UNDERTAKINGS**

1. The undersigned registrant hereby undertakes:

(a) To file, during any period in which offers or sales are being made, a post-effective amendment to this registration statement:

(i) To include any prospectus required by Section 10(a)(3) of the Securities Act of 1933;

(ii) To reflect in the prospectus any facts or events arising after the effective date of the registration statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in the registration statement. Notwithstanding the foregoing, any increase or decrease in the volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the Securities and Exchange Commission pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than 20% change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective registration statement; and

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(iii) To include any material information with respect to the plan of distribution not previously disclosed in the registration statement or any material change to such information in the registration statement;

*provided, however;* that paragraphs (a)(i) and (a)(ii) do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in reports filed with or furnished to the Commission by the registrant pursuant to Section 13 or Section 15(d) of the Securities Exchange Act of 1934 that are incorporated by reference in the registration statement.

(b) That, for the purpose of determining any liability under the Securities Act of 1933, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered herein, and the offering of such securities at that time shall be deemed to be the initial *bona fide* offering thereof.

(c) To remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering.

(d) That, for the purpose of determining liability of the registrant under the Securities Act of 1933 to any purchaser in the initial distribution of the securities, the undersigned registrant undertakes that in a primary offering of securities of the undersigned registrant pursuant to this registration statement, regardless of the underwriting method used to sell the securities to the purchaser, if the securities are offered or sold to such purchaser by means of any of the following communications, the undersigned registrant will be a seller to the purchaser and will be considered to offer or sell such securities to such purchaser:

(i) Any preliminary prospectus or prospectus of the undersigned registrant relating to the offering required to be filed pursuant to Rule 424;

(ii) Any free writing prospectus relating to the offering prepared by or on behalf of the undersigned registrant or used or referred to by the undersigned registrant;

(iii) The portion of any other free writing prospectus relating to the offering containing material information about the undersigned registrant or its securities provided by or on behalf of the undersigned registrant; and

(iv) Any other communication that is an offer in the offering made by the undersigned registrant to the purchaser.

2. The undersigned registrant hereby undertakes that, for purposes of determining any liability under the Securities Act of 1933, each filing of the registrant's annual report pursuant to Section 13(a) or Section 15(d) of the Securities Exchange Act of 1934 (and, where applicable, each filing of an employee benefit plan's annual report pursuant to Section 15(d) of the Securities Exchange Act of 1934) that is incorporated by reference in the registration statement shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of the securities at that time shall be deemed to be the initial *bona fide* offering thereof.
3. Insofar as indemnification for liabilities arising under the Securities Act of 1933 may be permitted to directors, officers and controlling persons of the registrant pursuant to the foregoing provisions, or otherwise, the registrant has been advised that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the Securities Act of 1933 and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer or controlling person of the registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Securities Exchange Act and will be governed by the final adjudication of such issue.

**SIGNATURES**

Pursuant to the requirements of the Securities Act of 1933, the Registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-8 and has duly caused this Registration Statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Memphis, State of Tennessee, on this 11th day of August, 2006.

**GTx, Inc.**

By: /s/ MITCHELL S. STEINER  
Mitchell S. Steiner, M.D., F.A.C.S.  
Chief Executive Officer

**POWER OF ATTORNEY**

**KNOW ALL PERSONS BY THESE PRESENTS**, that each person whose signature appears below constitutes and appoints Mitchell S. Steiner, Marc S. Hanover, Henry P. Doggrell and Mark E. Mosteller, and each or any one of them, his or her true and lawful attorney-in-fact and agent, with full power of substitution and resubstitution, for him or her and in his or her name, place and stead, in any and all capacities, to sign any and all amendments (including post-effective amendments) to this Registration Statement, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission (the "SEC"), and generally to do all such things in their names and behalf in their capacities as officers and directors to enable the registrant to comply with the provisions of the Securities Act of 1933 and all requirements of the SEC, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he or she might or could do in person, ratifying and confirming all that said attorneys-in-fact and agents, or any of them, or their or his substitutes or substitute, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act of 1933, this Registration Statement has been signed by the following persons in the capacities and on the dates indicated.

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ MITCHELL S. STEINER</u> Mitchell S. Steiner, M.D., F.A.C.S.	Chief Executive Officer, Vice-Chairman and Director <i>(Principal Executive Officer)</i>	August 11, 2006
<u>/s/ MARK E. MOSTELLER</u> Mark E. Mosteller	Chief Financial Officer <i>(Principal Accounting and Financial Officer)</i>	August 11, 2006
<u>/s/ J.R. HYDE, III</u> J.R. Hyde, III	Chairman of the Board of Directors	August 11, 2006
<u>/s/ MARC S. HANOVER</u> Marc S. Hanover	Director	August 11, 2006
<u>/s/ MICHAEL G. CARTER</u> Michael G. Carter, M.D.	Director	August 11, 2006
<u>/s/ ANDREW M. CLARKSON</u> Andrew M. Clarkson	Director	August 11, 2006
<u>/s/ J. KENNETH GLASS</u> J. Kenneth Glass	Director	August 11, 2006
<u>/s/ ROBERT W. KARR</u> Robert W. Karr, M.D.	Director	August 11, 2006
<u>/s/ ROSEMARY MAZANET</u> Rosemary Mazanet, M.D., Ph.D.	Director	August 11, 2006
<u>/s/ JOHN H. PONTIUS</u> John H. Pontius	Director	August 11, 2006
<u>/s/ TIMOTHY R. G. SEAR</u> Timothy R. G. Sear	Director	August 11, 2006

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ATTORNEYS AT LAW

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202 842-7800

August 11, 2006

GTx, Inc.  
3 N. Dunlap Street  
Van Vleet Building  
Memphis, Tennessee 38163

Ladies and Gentlemen:

You have requested our opinion with respect to certain matters in connection with the filing by GTx, Inc. (the "Company") of a Registration Statement on Form S-8 (the "Registration Statement") with the Securities and Exchange Commission covering the offering of up to 68,000 shares of the Company's Common Stock, par value \$0.001 per share, pursuant to the Company's Amended and Restated 2004 Non-Employee Directors' Stock Option Plan (the "Plan Shares").

In connection with this opinion, we have examined the Registration Statement and related Prospectus, the Company's Restated Certificate of Incorporation and Amended and Restated Bylaws, as currently in effect, the Company's Amended and Restated 2004 Non-Employee Directors' Stock Option Plan (the "Plan"), and such other documents, records, certificates, memoranda and other instruments as we deem necessary as a basis for this opinion. We have assumed the genuineness and authenticity of all documents submitted to us as originals, the conformity to originals of all documents submitted to us as copies thereof and the due execution and delivery of all documents where due execution and delivery are a prerequisite to the effectiveness thereof.

Our opinion is expressed only with respect to the federal laws of the United States of America and the General Corporation Law of the State of Delaware. We express no opinion as to whether the laws of any particular jurisdiction other than those identified above are applicable to the subject matter hereof.

On the basis of the foregoing, and in reliance thereon, we are of the opinion that the Plan Shares, when sold and issued in accordance with the Plan and the Registration Statement and related Prospectus, will be validly issued, fully paid and nonassessable (except as to shares issued pursuant to certain deferred payment arrangements, which will be fully paid and nonassessable when such deferred payments are made in full).

We consent to the filing of this opinion as an exhibit to the Registration Statement.

Sincerely,

COOLEY GODWARD LLP

By:           /s/ SUZANNE SAWOCHKA HOOPER            
Suzanne Sawochka Hooper

Consent of Independent Registered Public Accounting Firm

We consent to the incorporation by reference in the Registration Statement (Form S-8 No. 333-[\_\_\_\_]) pertaining to the Amended and Restated 2004 Non-Employee Directors' Stock Option Plan of GTX, Inc. for the registration of 68,000 shares of its common stock of our reports dated February 24, 2006, with respect to the financial statements of GTX, Inc., GTX, Inc.'s report on management's assessment of internal control over financial reporting, and the effectiveness of internal control over financial reporting of GTX, Inc., all included in its Annual Report (Form 10-K) for the year ended December 31, 2005, filed with the Securities and Exchange Commission.

/s/ Ernst & Young LLP

Memphis, Tennessee  
August 8, 2006