[GTx Letterhead]

January 19, 2011

Via EDGAR

United States Securities and Exchange Commission
Division of Corporation Finance
100 F Street, N.E.
Washington, D.C. 20549

Attn: Jeffrey Riedler
Johnny Gharib
Jennifer Riegel

Re: **GTx, Inc.**
Form 10-K
Filed March 15, 2010
File No. 000-50549

Ladies and Gentlemen:

On behalf of GTx, Inc. (the "**Company**"), this letter is being transmitted in response to comments received from the staff (the "**Staff**") of the Securities and Exchange Commission (the "**Commission**") by letter dated January 10, 2011 (the "**Comment Letter**") regarding the Company's response letter dated December 21, 2010 (the "**Prior Response Letter**") to the comments received from the Staff by letter dated December 15, 2010. The text of the Staff's comments has been included in this response letter in italics for your convenience, and the numbering of the paragraphs below correspond to the numbering of the Comment Letter.

Form 10-K, filed March 15, 2010

1. *We note your response to prior comment 1 and your proposed disclosure which states a range of royalties of a "low double-digit" in regard to the Orion agreement. Please revise your proposed disclosure to include a range of royalty rates not to exceed ten percent. Your current proposed disclosure of a "low double-digit royalty" is not specific enough to clarify that the range does not exceed ten percent.*

   Response:

   In response to the Staff's comment, the Company has revised its proposed disclosure of the Orion agreement for its 2010 Form 10-K to more specifically describe the royalty payable to Orion with respect to sales by us, our affiliates and third-party sublicensees, as applicable, of FARESTON® and other toremifene-based products. In this regard, the Company respectfully advises the Staff that under the Orion agreement, there is currently only one royalty rate applicable to such sales, which the Company has described as being in the "low teens" in its revised proposed disclosure. The revised

proposed disclosure for the Company's 2010 Form 10-K is set forth on **Exhibit A** attached hereto.

Intellectual Property, page 19

2. *We note your response to prior comments 2 and 3. To the extent that foreign patents and patent applications in Europe, Asia and other jurisdictions are material to your business, please provide draft disclosure to be included in your 2010 Form 10-K stating the countries in which these foreign patents are issued and where other patent applications are pending.*

   Response:

   In response to the Staff's comment, the Company has revised its proposed disclosure for its 2010 Form 10-K with respect to the countries in which foreign patents are issued and where other patent applications are pending, as reflected in the updated proposed disclosure as set forth on **Exhibit B** attached hereto.

   With respect to the updated proposed disclosure, the Company respectfully advises the Staff that the Company currently commercializes only one product and only in the United States, and that the Company's own sales and marketing efforts, if any, for its current or potential future product candidates that may be approved for commercial sale would be focused in the United States. As a result, U.S. patents and patent applications are generally the most important and potentially valuable to the Company. The Company's commercialization strategy for any of its current and potential future product candidates that may be approved for commercial sale also includes partnering commercial rights to third parties in regions outside of the United States, but to date, none of such product candidates have been approved for commercial sale. With respect to regions outside of the United States, the Company's owned and licensed patent portfolios are complex, are obtained over time and the patents and patent applications included in such portfolios are issued or pending, as applicable, in a significant number of countries around the world. Because the Company's product candidates have not received marketing approval in any jurisdiction, the Company is proposing to list in its updated proposed disclosure the countries that the Company currently believes represent potential major market opportunities for its product candidates (if such product candidates receive the requisite marketing approvals and the Company is able to establish and maintain relationships with third parties to commercialize such product candidates in such jurisdictions). In this regard, the Company undertakes to revisit its patent and intellectual property disclosures in its filings with the Commission in connection with future changes to the Company's commercialization or partnering strategies, as well as future changes to its business resulting from any approved products.

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The Company further acknowledges that:

- the Company is responsible for the adequacy and accuracy of the disclosure in the filings;
- Staff comments or changes to disclosure in response to Staff comments do not foreclose the Commission from taking any action with respect to the filings; and
- the Company may not assert Staff comments as a defense in any proceeding initiated by the Commission or any person under the federal securities laws of the United States.

Please do not hesitate to contact me at (901) 507-6916 or Chad Mills at (650) 843-5654 of Cooley LLP, outside counsel to the Company, if you have any questions or would like additional information regarding these matters.

Sincerely,

/s/ Henry P. Doggrell

Henry P. Doggrell
Vice President and General Counsel
GTx, Inc.

cc: Mitchell S. Steiner, Chief Executive Officer
Marc S. Hanover, President and Chief Operating Officer
Chadwick L. Mills, *Cooley LLP*

EXHIBIT A

Orion Corporation

In March 2000, we entered into a license and supply agreement with Orion to develop and commercialize products containing toremifene. Our rights under the original license agreement were limited to specific disease fields pertaining to prostate cancer. In December 2004, we entered into an agreement with Orion to purchase specified FARESTON® related assets which Orion had re-acquired from another licensee. We also entered into an amended and restated license and supply agreement in January 2005 with Orion which replaced the original license agreement. We paid Orion approximately $5.2 million under the 2004 agreements for the assets and related license rights.

Under the amended and restated license and supply agreement, we obtained an exclusive license from Orion to develop and commercialize toremifene-based products for all human indications worldwide, except breast cancer outside of the United States. We are required to pay Orion a portion of certain types of upfront and milestone income that we receive from third-party sublicensees, after we recover our clinical development costs, and a royalty in the low-teens on sales by us and our affiliates of FARESTON® for breast cancer in the United States. We are also required to pay Orion a royalty in the low-teens on sales by us, our affiliates and third-party sublicensees of other toremifene-based products, including toremifene 80 mg and toremifene 20 mg if approved for commercial sale. Our license and supply agreement with Orion requires that Orion will manufacture and supply all of our and our sublicensees' needs for clinical trial and commercial grade material for toremifene-based products developed and marketed in the United States and abroad, including toremifene globally and FARESTON® in the United States. Orion has the right to terminate its supply obligations at its election at any time as a result of our failure to obtain regulatory approval of one of our toremifene product candidates in the United States prior to December 31, 2009, in which event we will have the right to enter into a contract manufacturing agreement with another supplier for toremifene-based products. However, any arrangements we make for an alternative supply would have to be made with a qualified alternative supplier with appropriate FDA approval in order for us to obtain our supply requirements for toremifene. The term of the amended and restated license and supply agreement lasts, on a country-by-country basis, until the later of expiration of our own patents claiming the processes or the methods of use of toremifene for prostate cancer or the end of all marketing or regulatory exclusivity which we may obtain for toremifene-based products. The term of our issued and pending method of use patents pertaining to toremifene for prostate cancer extend from 2019 to 2025. Orion may terminate the amended and restated license and supply agreement, on a country-by-country basis, as a result of our uncured material breach, including under certain circumstances if we decided not to commercially launch toremifene in any major country after we obtain regulatory approval in such country, or our bankruptcy. Following the termination of the amended and restated license and supply agreement by Orion for our material breach, we will grant a royalty-bearing license to Orion to enable Orion to continue the development and commercialization of toremifene-based products in the countries in which the agreement is terminated.

EXHIBIT B

For toremifene in the United States and internationally, we have entered into an amended and restated license and supply agreement with Orion Corporation granting us an exclusive license under Orion's patents covering the composition of matter of toremifene for all uses in humans in the United States, and for all human uses outside the United States other than the treatment and prevention of breast cancer. However, Orion's patent for toremifene expired in the United States in September 2009 and foreign counterparts of this patent also have expired. As a result, we will need to rely primarily on the protection afforded by the method of use patents that either have been already issued or may later issue from our owned or licensed patent applications.

We have exclusively licensed from UTRF method of use patents and pending patent applications for specific disease indications and doses in the United States, and have licensed issued and pending patent applications in Canada, Australia, Japan, China and other countries in Asia, and before the European Patent Office designating Germany, Great Britain, Spain, France, Italy and other European Union countries, as well as in certain other countries outside those regions, related to the use of toremifene 20 mg for the reduction in the incidence of prostate cancer in high risk men with high grade PIN. The method of use patents issued in the United States related to the use of toremifene for this indication that we licensed from UTRF will expire in 2019. The method of use patents that we licensed from UTRF related to the use of toremifene for this indication and issued outside of the United States will expire between 2019 and 2020.

We have our own method of use patents in the United States, Australia and Canada, and pending patent applications in Japan and before the European Patent Office designating Germany, Great Britain, Spain, France, Italy and other European Union countries, as well as pending patent applications in certain other countries outside those regions, related to the use of toremifene 80 mg for the treatment of osteoporosis and reduction of fractures in men with prostate cancer treated by ADT and other side effects from ADT, such as bone loss and hot flashes. Our method of use patents issued in the United States related to the use of toremifene for the treatment of ADT-induced osteoporosis and fractures in men with prostate cancer will expire in 2023. Our method of use patents issued outside of the United States related to the use of toremifene 80 mg for the treatment of osteoporosis and fractures and other side effects of ADT in men with prostate cancer will expire in 2022. We own pending patent applications in the United States, Canada, Japan and other countries in Asia, and pending patent applications before the European Patent Office designating Germany, Great Britain, Spain, France, Italy and other European Union countries, as well as pending patent applications in certain other countries outside those regions, related to the method of use of toremifene 80 mg for the treatment of ADT-induced osteoporosis and fractures in men with prostate cancer that, if issued, would expire between 2022 and 2025.

Even though patents have issued in respect of our owned and licensed pending method of use patent applications, since patents covering the composition of matter of toremifene have expired, competitors could market and sell generic versions of toremifene at doses and in formulations that are bioequivalent to FARESTON® (toremifene citrate 60 mg) for uses other than the indications for toremifene covered by our issued and pending method of use patent applications, and individual physicians would be permitted to prescribe generic versions of toremifene 60 mg for indications that are protected by our or our licensors' method of use patents and pending patent applications. Assuming toremifene receives appropriate marketing approval, if patents do not issue in a particular country on account of our pending method of use patent applications related to the use of toremifene 80 mg for the treatment of osteoporosis and fractures and other side effects of ADT in men with prostate cancer, competitors may be able to market and sell generic versions of toremifene tablets for these indications in that country.

For Ostarine™ and our other SARM compounds, we have an exclusive license from UTRF under its issued patents and pending patent applications in the United States, Canada, Australia, Japan, China and other countries in Asia, before the European Patent Office designating Germany, Great Britain, Spain, France, Italy and other European Union countries, as well as in certain other countries outside those regions, covering the composition of matter of the active pharmaceutical ingredient for pharmaceutical products, pharmaceutical compositions and methods of synthesizing the active pharmaceutical ingredients. We have also exclusively licensed from UTRF issued and pending patent applications in the United States, Canada, Australia, Japan, China and other countries in Asia, before the European Patent

Office designating Germany, Great Britain, Spain, France, Italy and other European Union countries, as well as in certain other countries outside those regions, related to methods for building muscle mass and bone in patients, for treating bone related disorders, including bone frailty and osteoporosis, and for treating muscle wasting disorders, including cancer cachexia, using Ostarine™ and other SARM compounds. The patents we licensed from UTRF and issued in the United States for Ostarine and our other SARM compounds expire between 2021 and 2024, and the patents we licensed from UTRF and issued outside of the United States for Ostarine™ expire in 2025, and with respect to other SARM compounds, expire between 2021 and 2023.