



DIVISION OF
CORPORATION FINANCE

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

October 11, 2011

Via E-Mail

Craig J. Tuttle
President and Chief Executive Officer
Transgenomic, Inc.
12325 Emmet Street
Omaha, Nebraska 68164

Re: Transgenomic, Inc.
Form 10-K for the year ended December 31, 2010
Filed March 14, 2011
File No. 000-30975

Dear Mr. Tuttle:

We have reviewed your filing and have the following comments. In some of our comments, we may ask you to provide us with information so we may better understand your disclosure.

Please respond to this letter within ten business days by amending your filing, by providing the requested information, or by advising us when you will provide the requested response. If you do not believe our comments apply to your facts and circumstances or do not believe an amendment is appropriate, please tell us why in your response.

After reviewing any amendment to your filing and the information you provide in response to these comments, we may have additional comments.

Form 10-K for the year ended December 31, 2010

Report of Independent Registered Public Accounting Firm, page K-28

1. We note that the report of your Independent Registered Public Accounting Firm is not signed. Please amend your filing to provide a report from your Independent Registered Public Accounting Firm that is signed. Refer to Item 2-02(a) of Regulation S-X and Item 302 of Regulation S-T which provides guidance on including signatures in electronic filings.

Note B – Summary of Significant Accounting Policies, page K-34

Fair Value, page K-34

2. We note that your warrants and preferred stock conversion feature are recorded at fair value. Please revise future filings to provide all of the disclosures required by FASB ASC paragraphs 820-10-50-1 and 2 for all assets and liabilities measured at fair value on a recurring basis, including a description of your valuation methodology and significant assumptions.

Note C – Acquisition, page K-41

3. We note that in connection with your acquisition of FAMILION you recognized \$8.7 million of intangible assets. Please explain to us the valuation methodology and any significant assumptions you used in determining the fair value of the intangible asset acquired. Revise future filings as necessary.

Note L – Stockholders' Equity, page K-49

4. We note that your preferred stock is subject to mandatory redemption provisions and that you are accreting the preferred stock to its redemption value. Please revise future filings to disclose the nature and significant terms of the preferred stock, including a description of the redemption terms. Additionally, revise future filings to provide all of the disclosures required by FASB ASC 480-10-50.

We urge all persons who are responsible for the accuracy and adequacy of the disclosure in the filing to be certain that the filing includes the information the Securities Exchange Act of 1934 and all applicable Exchange Act rules require. Since the company and its management are in possession of all facts relating to a company's disclosure, they are responsible for the accuracy and adequacy of the disclosures they have made.

In responding to our comments, please provide a written statement from the company acknowledging that:

- the company is responsible for the adequacy and accuracy of the disclosure in the filing;
- staff comments or changes to disclosure in response to staff comments do not foreclose the Commission from taking any action with respect to the filing; 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.

Craig J. Tuttle
Transgenomic, Inc.
October 11, 2011
Page 3

You may contact Eric Atallah, Staff Accountant at (202) 551-3663 or me at (202) 551-3643 if you have questions regarding comments on the financial statements and related matters. Please contact Martin F. James, Senior Assistant Chief Accountant at (202) 551-3671 with any other questions.

Sincerely,

/s/ Kevin L. Vaughn

Kevin L. Vaughn
Accounting Branch Chief