



DIVISION OF
CORPORATION FINANCE

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

April 27, 2012

Via E-mail

Panna L. Sharma
Chief Executive Officer
Cancer Genetics, Inc.
201 Route 17 North, 2nd Floor
Rutherford, NJ 07070

**Re: Cancer Genetics, Inc.
Amendment No. 4 to Registration Statement on Form S-1
Filed April 23, 2012
File No. 333-178836**

Dear Mr. Sharma:

We have reviewed your amended registration statement 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 by amending your registration statement and providing the requested information. 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 registration statement and the information you provide in response to these comments, we may have additional comments.

General

1. We note discussion of your laboratory and research facilities and administrative office space in Rutherford, New Jersey and your lease for that space. We also note disclosure of negotiations regarding a letter of credit to replace the expired \$450,000 letter of credit with Capital One Bank. Please revise Management's Discussion and Analysis and where appropriate to update this disclosure in light of the arrangements addressed in Exhibit 10.45.
2. Also, it is unclear if you anticipate filing the \$250,000 letter of credit as a material agreement. Please file the agreement or advise us why you believe filing is not necessary.
3. We note your disclosure on the cover page and on page 33 regarding your status as an emerging growth company. Since you appear to qualify as an emerging growth company

as defined in the Jumpstart Our Business Startups Act (the “Act”), please revise your prospectus to provide the following additional disclosures:

- Describe how and when a company may lose emerging growth company status;
- Expand your description of the various exemptions that are available to you, in addition to the exemption from Section 404(b) of the Sarbanes-Oxley Act of 2002, such as the exemptions from Sections 14A(a) and (b) of the Securities Exchange Act of 1934; and
- Your election under Section 107(b) of the Act:
 - If you have elected to opt out of the extended transition period for complying with new or revised accounting standards pursuant to Section 107(b) of the Act, include a statement that the election is irrevocable; or
 - If you have elected to use the extended transition period for complying with new or revised accounting standards under Section 102(b)(2)(B) of the Act, provide a risk factor explaining that this election allows you to delay the adoption of new or revised accounting standards that have different effective dates for public and private companies until those standards apply to private companies. Please state in your risk factor that, as a result of this election, your financial statements may not be comparable to companies that comply with public company effective dates. Include a similar statement in your critical accounting policy disclosures in MD&A.

Exhibit 5.1

4. We note the assumption in the third paragraph that the legal opinion is conditioned upon effectiveness of the amended and restated certificate of incorporation. Please confirm that you will comply with Item 601(b)(3)(i) of Regulation S-K to file an appropriately unqualified opinion by post-effective amendment or on Form 8-K, as applicable, no later than the date of the offering, in the event there is a material change. Disclose in the prospectus that the effectiveness of the amended and restated certificate of incorporation is a condition to the issuance of shares in the offering. Refer to section II.B.2.f of Staff Legal Bulletin No. 19 for guidance.
5. Also, please file the amended and restated certificate of incorporation as an exhibit.

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 Act of 1933 and all applicable Securities 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.

Notwithstanding our comments, in the event you request acceleration of the effective date of the pending registration statement please provide a written statement from the company acknowledging that:

- should the Commission or the staff, acting pursuant to delegated authority, declare the filing effective, it does not foreclose the Commission from taking any action with respect to the filing;
- the action of the Commission or the staff, acting pursuant to delegated authority, in declaring the filing effective, does not relieve the company from its full responsibility for the adequacy and accuracy of the disclosure in the filing; and
- the company may not assert staff comments and the declaration of effectiveness as a defense in any proceeding initiated by the Commission or any person under the federal securities laws of the United States.

Please refer to Rules 460 and 461 regarding requests for acceleration. We will consider a written request for acceleration of the effective date of the registration statement as confirmation of the fact that those requesting acceleration are aware of their respective responsibilities under the Securities Act of 1933 and the Securities Exchange Act of 1934 as they relate to the proposed public offering of the securities specified in the above registration statement. Please allow adequate time for us to review any amendment prior to the requested effective date of the registration statement.

You may contact Joanna Lam, Staff Accountant, at (202) 551-3476 or John Archfield, Senior Staff Accountant, at (202) 551-3315 if you have questions regarding comments on the financial statements and related matters. Please contact Ruairi Regan at (202) 551-3269 or James Lopez, Branch Chief, at (202) 551-3536 with any other questions.

Sincerely,

/s/ James Lopez (for)

John Reynolds
Assistant Director

cc (via e-mail): Alan Wovsaniker, Esq.
Lowenstein Sandler PC