



DIVISION OF
CORPORATION FINANCE

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

March 28, 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. 2 to Registration Statement on Form S-1
Filed March 13, 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.

Summary, page 1

1. Please expand your disclosure regarding your claims to have superior diagnostic and prognostic values to include your claims regarding the gains and losses reported at genomic sites by you and your competitors as described in your response to prior comment 4. Also, expand your competition disclosure on page 85 to address the other providers of cytogenic analysis for CLL and SLL referenced in your response.

Cash Resources and Expenditure Requirements, page 61

2. We note the reference in the second paragraph to the "\$1.25 million funding commitment letter from one of our board members and significant stockholders." Please revise to address in your related party transaction discussion, including identification of the related party and material terms. Also, tell us the basis on which you rely to not file the funding commitment letter as an exhibit.

Certain Relationships and Related Party Transactions, page 122

3. We note your response to prior comment 10 from our letter dated March 2, 2012 regarding the agreement with European Trust Management, LLC and John Pappajohn. With a view to disclosure on page 59 or where appropriate, advise us if the \$50,000 of fees and expenses incurred by ETM, as disclosed in your initial filing, were reimbursed by ETM.

Exhibits and Financial Statement Schedules

4. We note your response to comment 11 from our letter dated March 2, 2012. It appears that the Agilent agreement should be fully disclosed and filed pursuant to Item 601(b)(10) of Regulation S-K. For example, the statements in the first risk factor on page 18 would be clearer given the context of such additional disclosure. Also, it is unclear how you concluded that the agreement with Agilent is an agreement in the ordinary course of your business, given its status as your supplier of microarrays. Please advise. Also, please tell us how you determined that the February 2012 agreement with Kamineni Life Sciences Pvt. Ltd need not be filed 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

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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