



DIVISION OF
CORPORATION FINANCE

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

March 2, 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. 1 to Registration Statement on Form S-1
Filed February 14, 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. We note your response to prior comment 1 and the statement on page 73 and elsewhere indicating that you believe no other company has had an oncology microarray approved for commercial use by the New York State Department of Health. Please revise to clarify the basis for your belief, which appears to be statements made by the New York State Department of Health.
2. We note your responses to comments 1, 2, 4, 6, 7 and 24 of our letter dated January 25, 2012. Please revise to provide more balanced and clearer disclosure of the nature and status of your current testing and services. For example, it appears that your MatBA CLL test, which you launched commercially in the first quarter of 2011, and the MatBA-SLL, which you currently offer, generate an insignificant percentage of your revenues. It also appears that non-proprietary testing currently generates substantially all of your revenues, not your genomic, DNA-based probes and microarrays, which are given much more

prominence on page 1 and the rest of your Summary. Please revise accordingly in quantitative and qualitative terms. With respect to prior comment 24 and with a view to clarifying disclosure, advise us of the principal categories of non-proprietary testing services you provide.

3. Please also revise your summary to:
 - Clarify, if true, that commercially launching the tests identified in the last paragraph on page 2 as well as any of your tests to other laboratories and testing sites would likely take more than, for example, two years due to necessary studies and subsequent FDA and other regulatory requirements; and
 - Indicate “the early stage nature of [your] business” and the fact that you have “engaged in limited sales and marketing activity to date ... [which has been] concentrated with a limited number of doctors, medical practices and community hospitals,” as stated in your response letter.
4. Additionally, please provide objective support for your revised claims in this section regarding the superior diagnostic and prognostic values of your tests over other currently available tests and services and for your claims on page 68 that there are no equivalent prognostic tests for lymphomas, leukemias and urogenital and HPV-associated cancers. Address the role of other providers of genetic diagnostics identified on pages 12 and 86 in providing such services.
5. It is unclear from your response to prior comment 6 how the current status of FDA regulations affects your ability to determine when you intend to conduct the clinical validation activities that are required prior to seeking FDA approval. With a view to disclosure, please advise.
6. Please reconcile your disclosure in the third paragraph on page 50 that your board of directors determined a reasonable estimate of the fair value of your stock with the statement on page 51 that you cannot assure the accuracy of any particular valuation of your stock and that the models you decided to use do not, in your opinion, provide a reliable measure of the fair value of your common stock. Please note that it is inappropriate to disclaim responsibility for the information you choose to provide in your filing. Please revise or advise.

Management's Discussion and Analysis of Financial Condition and Results of Operations, page 46

Critical Accounting Policies and Significant Judgments and Estimates, page 48

Stock-Based Compensation Expense, page 49

Common Stock Valuation, page 50

7. We note your revised disclosure in response to comment 14 and 15 of our letter dated January 25, 2012. Please also include the requested disclosures as of December 31, 2011 in your Form S-1/A2. Also confirm to us that you will provide the requested disclosures up through the estimated IPO price range when it is established.

Capital Resources and Expenditure Requirements, page 61

8. Refer to prior comment 23. Given your disclosure on page 61 that you may need to raise additional capital, even with the proceeds of the offering, please discuss your liquidity on a long term basis as required by Instruction 5 of Item 303(a) of Regulation S-K.

Base salaries, page 108

9. Please describe in more detail how your board determined the amount of the salary increase to award to Jane Houldsworth for 2011.

Certain Relationships and Related Party Transactions, page 122

10. We note your deletion of the disclosure regarding the credit agreement entered into with European Trust Management, LLC and John Pappajohn. Please include such disclosure together with the substance of your response to prior comment 22 or provide us with your legal analysis of why such disclosure is not required.

Exhibits and Financial Statement Schedules

11. Please provide an expanded response to prior comment 49 that explains clearly how you concluded that the agreements with Agilent and Labomics are not material to investors or were entered into in the ordinary course.
12. Please update your financial statements, as applicable, pursuant to Rule 3-12 of Regulation S-X.

December 31, 2010 Financial Statements, page F-21

13. We note in your response to comment 37 of our letter dated January 25, 2012 that you will give retrospective effect to the stock-split in the historical financial statements upon

the effective date of the split. Please obtain a preamble report from your auditor comprised of the standard report preceded by a preamble indicating that the split has not occurred, but when it does, the auditor expects to be in a position to furnish the report presented.

Notes to Consolidated Financial Statements, page F-28

Note 10. Income Taxes, page F-36

Uncertain Tax Positions, page F-38

14. We note in your response to comment 44 of our letter dated January 25, 2012 that the increase in unrecognized tax benefits arose from a tax benefit created upon the issuance of stock-based compensation in 2010. Please further explain to us supplementally how an unrecognized tax benefit arose from a tax benefit created upon the issuance of stock-based compensation. Also revise to disclose where you record the liabilities for unrecognized tax benefits on your consolidated balance sheets.

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