
With copies to:

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Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer or a smaller reporting company. See definitions of “large accelerated filer,” “accelerated filer,” and “smaller reporting company” in Rule 12b-2 of the Exchange Act. (Check one):

Large
accelerated filer Accelerated filer o

Non-accelerated
filer o Smaller Reporting Company x
(Do not check if
a smaller
reporting
company)

CALCULATION OF REGISTRATION FEE

Title of Securities to be Registered	Amount to be Registered (1)	Proposed Maximum Offering Price per Share (2)	Proposed Maximum Aggregate Offering Price (2)	Amount of Registration Fee (2)
Common Stock, \$0.0001 par value per share	500,000	\$1.425	\$712,500	\$82.58

(1) Covers 500,000 shares of common stock issuable under the Cancer Genetics, Inc. Amended and Restated 2011 Equity Incentive Plan (the “2011 Plan”). In addition, pursuant to Rule 416(c) under the Securities Act of 1933, as amended, this registration statement also covers an indeterminable number of shares of common stock issuable under the 2011 Plan, as these amounts may be adjusted as a result of stock splits, stock dividends and anti-dilution provisions.

(2) Pursuant to Rule 457(c) and Rule 457(h) under the Securities Act of 1933, as amended, the proposed maximum offering price per share and the proposed maximum aggregate offering price are estimated for the purpose of calculating the amount of the registration fee and are based on the average of the high and low sales price on the NASDAQ Capital Market on November 10, 2016.

EXPLANATORY NOTE

This Registration Statement is being filed by the registrant, Cancer Genetics, Inc. (the “Company”), for the purpose of registering an additional 500,000 shares of common stock, par value \$0.0001 per share (“Common Stock”), to be issued under the Cancer Genetics, Inc. Amended and Restated 2011 Equity Incentive Plan (the “Plan”), pursuant to General Instruction E on Form S-8 (Registration of Additional Securities). The contents of the original registration on Form S-8 for the Plan filed on October 1, 2013 (File No. 333-191521) are hereby incorporated by reference and made a part hereof. The stockholders of the registrant approved amending the Plan for this purpose at the annual meeting of stockholders held on October 11, 2016.

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PART I

INFORMATION REQUIRED IN THE SECTION 10(a) PROSPECTUS

The information required to be contained in the Section 10(a) prospectus is omitted from this Registration Statement and will be delivered to the participants in the Cancer Genetics, Inc. Amended and Restated 2011 Equity Incentive Plan (the "Plan") covered by this Registration Statement pursuant to Rule 428 of the Securities Act of 1933, as amended (the "Securities Act"), and the note to Part I of Form S-8.

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Part II

INFORMATION REQUIRED IN THE REGISTRATION STATEMENT

Item 3. Incorporation of Documents by Reference.

The following documents, which have been filed by Cancer Genetics, Inc. (the "Company") with the Commission, are hereby incorporated by reference in this Registration Statement:

1. Our Annual Report on Form 10-K for the fiscal year ended December 31, 2015, filed with the SEC on March 10, 2016;

2. Amendment No. 1 on Form 10-K/A to our Annual Report on Form 10-K for the fiscal year ended December 31, 2015, filed with the SEC on April 28, 2016;

3. Our Quarterly Reports on Form 10-Q for the quarterly period ended March 31, 2016 filed with the SEC on May 10, 2016, for the quarterly period ended June 30, 2016 filed with the SEC on August 9, 2016, and for the quarterly period ended September 30, 2016 filed with the SEC on November 9, 2016;

4. Our Current Reports on Form 8-K and amendments thereto, filed with the SEC on March 10, 2016, May 10, 2016, May 20, 2016, June 30, 2016, July 22, 2016, August 10, 2016, September 9, 2016, September 16, 2016, October 13, 2016 and November 10, 2016 (excluding any information deemed furnished pursuant to Item 2.02 or Item 7.01 of any such Current Report on Form 8-K);

5. Our Proxy Statement on Schedule 14A for our 2016 Annual Meeting of Stockholders, filed with the SEC on September 12, 2016.

6. Description of our common stock contained in the Registration Statement on Form 8-A, declared effective on August 12, 2013 (including any amendment or report filed with the SEC for the purpose of updating such description).

All documents subsequently filed by the Company pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act, after the date of this Registration Statement and prior to the filing of a post-effective amendment to this Registration Statement which indicates that all securities offered hereby have been sold or which deregisters all securities then remaining unsold, shall be deemed to be incorporated by reference in this Registration Statement and to be a part hereof from the date of filing of such documents. Any statement contained in a document incorporated or deemed to be incorporated by reference herein shall be deemed to be modified or superseded for purposes of this Registration Statement to the extent that a statement contained herein or in any other subsequently filed document which also is or is deemed to be incorporated by reference herein modifies or supersedes such statement. Any such statement so modified or superseded shall not be deemed, except as so modified or superseded, to constitute a part of this Registration Statement.

Item 8. Exhibits.

For a list of exhibits, see the Exhibit Index in this Registration Statement, which is incorporated into this Item by reference.

Item 9. Undertakings.

(a) The undersigned registrant hereby undertakes:

(1) To file, during any period in which offers or sales are being made, a post-effective amendment to this registration statement:

(i) To include any prospectus required by section 10(a)(3) of the Securities Act of 1933;

(ii) To reflect in the prospectus any facts or events arising after the effective date of the registration statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information in the registration statement. Notwithstanding the foregoing, any increase or decrease in volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the Commission pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than a 20% change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective registration statement;

(iii) To include any material information with respect to the plan of distribution not previously disclosed in the registration statement or any material change to such information in the registration statement;

Provided, however, that Paragraphs (a)(1)(i) and (a)(1)(ii) of this section shall not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in reports filed with or furnished to the Commission by the registrant pursuant to section 13 or section 15(d) of the Securities Exchange Act of 1934 (15 U.S.C. 78m or 78o(d)) that are incorporated by reference in the registration statement.

(2) That, for the purpose of determining any liability under the Securities Act of 1933, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

(3) To remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering.

(b) The undersigned registrant hereby undertakes that, for purposes of determining any liability under the Securities Act of 1933, each filing of the registrant's annual report pursuant to section 13(a) or section 15(d) of the Securities Exchange Act of 1934 (and, where applicable, each filing of an employee benefit plan's annual report pursuant to section 15(d) of the Securities Exchange Act of 1934) that is incorporated by reference in the registration statement shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

(c) Insofar as indemnification for liabilities arising under the Securities Act of 1933 may be permitted to directors, officers and controlling persons of the registrant pursuant to the foregoing provisions, or otherwise, the registrant has been advised that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer or controlling person of the registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Act and will be governed by the final adjudication of such issue.

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SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, the Registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-8 and has duly caused this Registration Statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the city of Rutherford, State of New Jersey, on this 14th day of November 2016.

Cancer Genetics, Inc.

By:/s/
Panna
L.
Sharma
Panna L.
Sharma
Chief
Executive
Officer

POWER OF ATTORNEY AND SIGNATURES

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoint Panna L. Sharma and Ed Sitar, and each of them, his attorneys-in-fact, with full power of substitution for him in any and all capacities, to sign any amendments to this Registration Statement, including any and all pre-effective and post-effective amendments and to file such amendments thereto, with exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, hereby ratifying and confirming all that said attorneys-in-fact, or their substitute or substitutes, may do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act of 1933, as amended, this registration statement has been signed by the following persons in the capacities and on the dates indicated.

Signature	Title	Date
/s/ Panna L. Sharma Panna L. Sharma	Chief Executive Officer and Director (Principal Executive Officer)	November 14, 2016
/s/ Edward J. Sitar Edward J. Sitar	Chief Financial Officer (Principal Financial and Accounting Officer)	November 14, 2016
/s/ John Pappajohn John Pappajohn	Chairman of the Board of Directors	November 14, 2016
/s/ Edmund Cannon Edmund Cannon	Director	November 14, 2016
/s/ Raju S. K. Chaganti Raju S. K. Chaganti, Ph.D.	Director	November 14, 2016

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/s/ Geoffrey Harris Director November 14, 2016
Geoffrey Harris

/s/ Howard McLeod Director November 14, 2016
Howard McLeod, Pharm.D.

/s/ Franklyn G. Prendergast Director November 14, 2016
Franklyn G. Prendergast, M.D., Ph.D.

/s/ Michael J. Welsh Director November 14, 2016
Michael J. Welsh, M.D.

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EXHIBIT INDEX

Exhibit Number	Description of Exhibit
4.1	Third Amended and Restated Certificate of Incorporation of Cancer Genetics, Inc., filed as Exhibit 3.1 to quarterly report on Form 10-Q filed on May 15, 2013 and incorporated herein by reference.
4.2	Amended and Restated Bylaws of Cancer Genetics, Inc., filed as Exhibit 3.4 to Form S-1/A filed on April 30, 2012 (File No. 333-178836) and incorporated herein by reference.
10.1	2011 Equity Incentive Plan, as amended and restated effective May 14, 2015, filed as Exhibit 10.1 to Form S-8 filed on July 28, 2015 (File Number 333-205903) and incorporated herein by reference.
10.2	Amendment, dated as of October 11, 2016, to Amended and Restated Cancer Genetics, Inc. 2011 Equity Incentive Plan, filed as Exhibit 10.1 to the Current Report on Form 8-K filed on October 13, 2016 and incorporated herein by reference.
5.1*	Opinion of Lowenstein Sandler LLP
23.1*	Consent of RSM US LLP
23.2	Consent of Lowenstein Sandler LLP (filed as part of Exhibit 5.1).
24.1	Power of Attorney (included on the signature page).

* Filed herewith.