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

**POST-EFFECTIVE AMENDMENT NO. 2
ON FORM S-3
TO FORM S-4 REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933**

INVITAE CORPORATION

(Exact name of registrant as specified in its charter)

Delaware
(State or other jurisdiction of
incorporation or organization)

27-1701898
(I.R.S. Employer
Identification Number)

1400 16th Street, San Francisco, California 94103
(415) 374-7782
(Address, including zip code, and telephone number, including area code, of Registrant's principal executive offices)

Sean E. George, Ph.D.
President and Chief Executive Officer
Invitae Corporation
1400 16th Street
San Francisco, California 94103
(415) 374-7782
(Name, address, and telephone number, including area code, of agent for service)

Copies to:

Thomas Brida
General Counsel
Invitae Corporation
1400 16th Street
San Francisco, California 94103
(415) 374-7782

Mike Hird
Patty M. DeGaetano
Pillsbury Winthrop Shaw Pittman LLP
12255 El Camino Real, Suite 300
San Diego, California 92130
(619) 234-5000

Approximate date of commencement of proposed sale to the public: From time to time.

If the only securities being registered on this Form are being offered pursuant to dividend or interest reinvestment plans, please check the following box:

If any of the securities being registered on this Form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933, other than securities offered only in connection with dividend or interest reinvestment plans, check the following box:

If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, please check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

If this Form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

If this Form is a registration statement pursuant to General Instruction I.D. or a post-effective amendment thereto that shall become effective upon filing with

the Commission pursuant to Rule 462(e) under the Securities Act, check the following box.

If this Form is a post-effective amendment to a registration statement filed pursuant to General Instruction I.D. filed to register additional securities or additional classes of securities pursuant to Rule 413(b) under the Securities Act, check the following box.

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer

Accelerated filer

Non-accelerated filer (Do not check if a smaller reporting company)

Smaller reporting company

Emerging growth company

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 7(a)(2)(B) of the Securities Act.

CALCULATION OF REGISTRATION FEE

Title of each class of securities to be registered	Amount to be registered	Proposed maximum offering price per share	Proposed maximum aggregate offering price	Amount of registration fee
Common stock, \$0.0001 par value per share	1,479,188(1)	(2)	(2)	(2)

- (1) Pursuant to Rule 416 under the Securities Act of 1933, the shares of common stock being registered hereunder include such indeterminate number of shares of common stock as may be issuable with respect to the shares of common stock being registered hereunder as a result of stock splits, stock dividends or similar transactions.
- (2) This Post-Effective Amendment No. 2 on Form S-3 covers securities that were originally registered on Invitae's Registration Statement on Form S-4 (File No. 333-220447), as amended. All filing fees payable in connection with the issuance of these securities were previously paid in connection with the filing of the Registration Statement on Form S-4, to which this Post-Effective Amendment No. 2 relates.

The Registrant hereby amends this registration statement on such date or dates as may be necessary to delay its effective date until the Registrant shall file a further amendment which specifically states that this registration statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act of 1933, as amended, or until the registration statement shall become effective on such date as the Securities and Exchange Commission, acting pursuant to said Section 8(a), may determine.

EXPLANATORY NOTE

Invitae Corporation (“Invitae”) hereby amends its Registration Statement on Form S-4 (Registration No. 333-220447) originally filed on September 13, 2017, as amended by Pre-Effective Amendment No. 1 filed on September 28, 2017 and Post-Effective Amendment No. 1 filed on April 20, 2018 (as amended, the “Form S-4”), by filing this Post-Effective Amendment No. 2 on Form S-3 (the “Form S-3”).

On November 14, 2017, pursuant to the Agreement and Plan of Merger (the “Merger Agreement”), dated as of July 31, 2017, by and among Invitae, CombiMatrix Corporation (“CombiMatrix”), and Coronado Merger Sub, Inc. (“Merger Sub”), Merger Sub merged with and into CombiMatrix, with CombiMatrix surviving as a wholly owned subsidiary of Invitae (the “Merger”).

This Form S-3 relates to the offer and sale of an aggregate of 1,479,188 shares of Invitae common stock issuable upon the exercise of outstanding Series F warrants which were assumed by Invitae pursuant to the Merger Agreement (as described herein). All such shares of Invitae common stock underlying such warrants were originally registered by Invitae on the Form S-4, which became effective on October 5, 2017.

The information in this prospectus is not complete and may be changed. These securities may not be sold until the registration statement filed with the Securities and Exchange Commission is effective. This prospectus is not an offer to sell and it is not soliciting an offer to buy these securities in any jurisdiction where the offer or sale is not permitted.

SUBJECT TO COMPLETION, DATED APRIL 20, 2018



PROSPECTUS

**INVITAE CORPORATION
1,479,188 SHARES OF COMMON STOCK**

On November 14, 2017, pursuant to the Agreement and Plan of Merger (the “Merger Agreement”), dated as of July 31, 2017, by and among Invitae, CombiMatrix Corporation (“CombiMatrix”) and Coronado Merger Sub, Inc. (“Merger Sub”), Merger Sub merged with and into CombiMatrix, with CombiMatrix surviving as a wholly owned subsidiary of Invitae (the “Merger”).

Pursuant to the Merger Agreement, as described in the Registration Statement on Form S-4 (Registration No. 333-220447) filed by Invitae (the “Form S-4”), which became effective on October 5, 2017, at the effective time of the Merger (the “Effective Time”), each outstanding and unexercised Series F warrant to purchase shares of common stock, \$0.001 par value per share, of CombiMatrix (“CombiMatrix common stock”), issued by CombiMatrix (each, a “CombiMatrix Series F warrant”) was assumed by Invitae and converted into a warrant (an “Invitae Series F warrant”) to acquire (i) that number of whole shares of common stock, \$0.0001 par value per share, of Invitae (“Invitae common stock”) equal to the product of (x) the number of shares of CombiMatrix common stock subject to such CombiMatrix Series F warrant immediately prior to the Effective Time multiplied by (y) 0.869244 (the “Merger Exchange Ratio”), (ii) at an exercise price per share of Invitae common stock equal to the quotient of (x) the exercise price per share of CombiMatrix common stock for such CombiMatrix Series F warrant of \$5.17, divided by (y) the Merger Exchange Ratio, resulting in an adjusted exercise price of \$5.95 per share for the Series F warrants. Each CombiMatrix Series F warrant assumed and converted into an Invitae Series F warrant continues to have, and is subject to, substantially the same terms and conditions as applied to such CombiMatrix Series F warrants immediately prior to the Effective Time. The Series F warrants expire on March 24, 2021.

This prospectus relates to the offer and sale of an aggregate of 1,479,188 shares of Invitae common stock which are issuable upon the exercise of outstanding Invitae Series F warrants.

Shares of Invitae common stock are traded under the symbol “NVTA” on the New York Stock Exchange.

Investing in these securities involves risks. See “Risk Factors” in our Annual Report on Form 10-K for the year ended December 31, 2017 and in other documents that we subsequently file with the Securities and Exchange Commission which are incorporated by reference into this prospectus.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or passed upon the accuracy or adequacy of this prospectus. Any representation to the contrary is a criminal offense.

The date of this prospectus is [], 2018

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ABOUT THIS PROSPECTUS

Unless the context otherwise requires, references in this prospectus to “Invitae,” “we,” “us” and “our” refer to Invitae Corporation and its subsidiaries.

Invitae and the Invitae logo are our trademarks. This prospectus and the documents incorporated by reference into this prospectus may also contain trademarks and trade names that are the property of their respective owners. We do not intend our use or display of other companies’ trade names, trademarks or service marks to imply relationships with, or endorsements or sponsorship of us by, these other companies.

We have not authorized anyone to provide any information other than that contained or incorporated by reference in this prospectus, any applicable prospectus supplement or any free writing prospectus prepared by or on behalf of us or to which we have referred you. We take no responsibility for, and can provide no assurance as to the reliability of, any other information that others may give you. We are not making an offer to sell these securities in any jurisdiction where the offer or sale is not permitted. You should assume that the information in this prospectus and any prospectus supplement, or incorporated by reference, is accurate only as of the dates of those documents. Our business, financial condition, results of operations and prospects may have changed since those dates.

PROSPECTUS SUMMARY

This summary contains basic information about us and this offering. Because it is a summary, it does not contain all of the information that you should consider before investing in shares of Invitae common stock. You should read this entire prospectus and the documents incorporated by reference carefully, including the section entitled “Risk Factors” in our Annual Report on Form 10-K and any updates to such risks in subsequently filed Quarterly Reports on Form 10-Q, the section entitled “Risk Factors” in our Registration Statement on Form S-4 (Registration No. 333-220447) and our financial statements and the notes thereto incorporated by reference into this prospectus before making an investment decision.

Invitae Corporation

Our Company

Our mission is to bring comprehensive genetic information into mainstream medical practice to improve the quality of healthcare for billions of people. Combining genetic testing services that support patient care throughout life’s journey – from family planning, to proactive health screening, to inherited disease diagnosis – with a unique, rapidly expanding network of patients, healthcare providers, biopharma and advocacy partners, we seek to capture the broad potential of genetics and expand its use across the healthcare continuum.

We are aiming to combine genetic information and clinical data into a seamless genome network to accelerate research, clinical trials and disease management. Through the custom design and application of automation, robotics and bioinformatics software solutions tailored to the complexity of sample processing and complex variant interpretation, we believe we can apply our world-class clinical expertise to medical interpretation at scale, simplifying the process of obtaining and utilizing affordable, high-quality genetic information to inform critical healthcare decisions. By pioneering new ways of sharing and understanding genetic information, we believe we are transforming the field of genetics from one-dimensional testing to complex information management.

We launched our first commercial offering in November 2013 with an offering of approximately 200 genes and have grown our test menu over time to include more than 20,000 genes. Since our commercial launch through December 31, 2017, we have delivered a total of approximately 220,000 test reports. In 2017, we accessioned approximately 150,000 samples and generated revenue of approximately \$68.2 million reflecting more than a 150% and 170% increase over 2016 volume and revenue, respectively. In 2017, we achieved a full-year gross profit of \$18.1 million, compared to a full-year gross loss of \$2.8 million in 2016. In support of our efforts to reduce cost per test, expand our test menu and develop a scalable laboratory infrastructure, we incurred research and development expenses of \$46.5 million, \$44.6 million and \$42.8 million in 2017, 2016 and 2015, respectively. At December 31, 2017, we had an accumulated deficit of \$398.6 million. We increased our number of employees to 594 at December 31, 2017 from 332 at December 31, 2016. Our sales force almost doubled to over 100 at December 31, 2017 from just over 50 at December 31, 2016. We expect headcount will continue to increase in 2018 as we add staff to support anticipated growth.

Our rapid growth in diagnostic testing has accelerated the transition of our business from a traditional sample-by-sample, indication-by-indication, test-by-test market to an extensive, highly-accurate and accessible network focused on utilization of genetics in personal healthcare. Our value proposition for customers is simple: Genetic information is more valuable when shared.

We began by building out our initial offering in competitive and technically challenging clinical areas, including comprehensive panels for hundreds of hereditary conditions in cancer, cardiology, neurology, pediatrics and rare diseases. In 2017, we expanded our platform of clinical testing services to include assays totaling over 20,000 genes, including our medical exome, and began offering tests that could be used for proactive health and wellness screening. While we have expanded the breadth and complexity of our testing capabilities, we have also invested in a series of process improvements that have enabled us to maintain our strategy to lower the cost and improve access to genetic testing.

In January 2017, we acquired AltaVoice, a patient-centered data company with a global platform for collecting, curating, coordinating and delivering safeguarded data from patients and clinicians. This acquisition expands our genome network, designed to connect patients, clinicians, advocacy organizations, researchers and therapeutic developers to accelerate the understanding, diagnosis and treatment of hereditary disease. In June 2017, we acquired Ommdom, Inc., a company that develops, commercializes and sells hereditary risk assessment and management software, including CancerGene Connect, a cancer genetic counseling platform. The acquisition of Ommdom expands our suite of genome management offerings designed to help patients and clinicians use genetic information as part of mainstream medical care.

We also established a position in family health genetic information services through the strategic acquisition of reproductive health testing capabilities. In August 2017, we acquired Good Start Genetics, Inc., a molecular diagnostics company focused on preimplantation and carrier screening for inherited disorders. Good Start's next-generation sequencing offerings include carrier screening and preimplantation embryo testing, which provide women, their partners and their clinicians with insightful and actionable information to promote successful pregnancies and help build healthy families. In November 2017, we acquired CombiMatrix Corporation, a company which specializes in prenatal diagnosis, miscarriage analysis and pediatric developmental disorders. CombiMatrix's services include advanced technologies, such as single nucleotide polymorphism chromosomal microarray analysis, next generation sequencing, and expertise handling a variety of technically challenging sample types.

We have employed a disciplined approach to our acquisitions and have developed experience integrating acquisitions onto our platform. Through our approach, we have benefited from the advantages of scale, enabling us to lower cost of goods, leverage our operating infrastructure, increase cash flow and accelerate development of our capabilities. We intend to continue to invest in our business and may partner with companies or pursue acquisitions that complement our test offerings and capabilities.

In addition to investing in platform content, informatics solutions and infrastructure to support network development, we have continued to expand our genome network by partnering with biopharmaceutical companies, including Alnylam Pharmaceuticals, Inc., Ariad Pharmaceuticals, Inc. (a subsidiary of Takeda Pharmaceutical Company Limited), AstraZeneca and Merck & Co., Inc., BioMarin Pharmaceutical Inc., Blueprint Medicines Corporation, Jazz Pharmaceuticals plc, MyoKardia, Inc., Parion Sciences, Inc. and others to support clinical trial recruitment and other initiatives. Our biopharmaceutical industry partnerships are complemented by partnerships with leading health systems, executive health programs and leading research institutions, including the Geisinger Health System, the Mayo Clinic, Memorial Sloan Kettering Cancer Center, MedCan, NorthShore University HealthSystem and Stanford Health Care, among others.

We plan to invest in expanding this network, which we believe will help connect patients with potential treatments, clinical trials, researchers, clinicians, advocacy organizations and other resources to help inform and improve patients' health.

We believe that the keys to our future growth will be to steadily increase the amount of genetic content we offer, consistently improve the client experience, drive physician and patient utilization of our website for ordering and delivery of results, achieve broad reimbursement coverage for our tests from third-party payers, increase the number of strategic partners working with us to add value for our clients, and consistently drive down the price per gene for genetic analysis and interpretation.

For further discussion of the material elements of our business, please refer to our Annual Report on Form 10-K for the year ended December 31, 2017, and any subsequent reports we file with the Securities and Exchange Commission (the "SEC"), which are incorporated by reference in this prospectus.

Our principal executive offices are located at 1400 16th Street, San Francisco, CA 94103. Our telephone number is (415) 374-7782.

CombiMatrix Series F Warrants

On November 14, 2017, pursuant to the Merger Agreement, Merger Sub merged with and into CombiMatrix, with CombiMatrix surviving as a wholly owned subsidiary of Invitae. Pursuant to the Merger Agreement, Invitae assumed all outstanding and unexercised Series F warrants to acquire shares of CombiMatrix common stock previously issued by CombiMatrix, and such warrants were converted into warrants to acquire (i) that number of whole shares of Invitae common stock equal to the product of (x) the number of shares of CombiMatrix common stock subject to such CombiMatrix Series F warrant immediately prior to the effective time multiplied by (y) 0.869244 (the "Merger Exchange Ratio"), (ii) at an exercise price per share of Invitae common stock equal to the quotient of (x) the exercise price per share of CombiMatrix common stock for such CombiMatrix Series F warrant of \$5.17, divided by (y) the Merger Exchange Ratio, resulting in an adjusted exercise price of \$5.95 for the Series F warrants. Each CombiMatrix Series F warrant assumed and converted into an Invitae Series F warrant continues to have, and is subject to, substantially the same terms and conditions as applied to such CombiMatrix Series F warrants immediately prior to the effective time. The Series F warrants expire on March 24, 2021.

THE OFFERING

Issuer	Invitae Corporation
Common stock offered	This prospectus relates to the offer and sale of an aggregate of 1,479,188 shares of Invitae common stock which are issuable upon the exercise of outstanding Series F warrants assumed by Invitae in connection with the Merger.
Use of proceeds	We will not receive any proceeds from the sale of shares of Invitae common stock covered by this prospectus other than proceeds from the exercise of the Series F warrants whose underlying shares of Invitae common stock are covered by this prospectus. We have no plans for the application of any of these proceeds other than for general corporate purposes.
Risk factors	See “Risk Factors” for a discussion of factors you should consider carefully before deciding to invest in our common stock.
NYSE trading symbol	“NVTA”

RISK FACTORS

Investing in Invitae is subject to uncertainties and risks. You should carefully consider and evaluate all of the information included and incorporated by reference in this prospectus, including the risk factors incorporated by reference from Invitae's Annual Report on Form 10-K for the year ended December 31, 2017 under the section entitled "Item 1A. Risk Factors," from time to time in other filings with the SEC, and from Invitae's Registration Statement on Form S-4 (Registration No. 333-220447), filed with the SEC on September 13, 2017, as amended, under the section entitled "Risk Factors." We encourage you to read these risk factors in their entirety. In addition to these risks, other risks and uncertainties not presently known to us or that we currently deem immaterial may also adversely affect our business operations and financial condition. Such risks could cause actual results to differ materially from anticipated results. This could cause the trading price of shares of Invitae common stock to decline, perhaps significantly, and you may lose part or all of your investment.

CAUTIONARY STATEMENT REGARDING FORWARD-LOOKING STATEMENTS

When used in this prospectus, the words "expects," "believes," "anticipates," "estimates," "may," "could," "intends," and similar expressions are intended to identify forward-looking statements. These statements are subject to known and unknown risks and uncertainties that could cause actual results to differ materially from those projected or otherwise implied by the forward-looking statements. These forward-looking statements speak only as of the date of this prospectus. Given these risks and uncertainties, you should not place undue reliance on these forward-looking statements. Additional cautionary statements or discussions of risks and uncertainties that could affect our results or the achievement of the expectations described in forward-looking statements are contained in the documents we incorporate by reference into this prospectus.

These forward-looking statements speak only as of the date of this prospectus. We expressly disclaim any obligation or undertaking to release publicly any updates or revisions to any forward-looking statements contained herein to reflect any change in our expectations with regard thereto or any change in events, conditions or circumstances on which any such statements are based. You should, however, review additional disclosures we make in our Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, and Current Reports on Form 8-K filed with the SEC.

USE OF PROCEEDS

We will not receive any proceeds from the sale of shares of Invitae common stock covered by this prospectus other than proceeds from the exercise of the Series F warrants whose underlying shares of Invitae common stock are covered by this prospectus. We have no plans for the application of any of these proceeds other than for general corporate purposes. We have no assurance that any of the Series F warrants will be exercised.

PLAN OF DISTRIBUTION

We are registering an aggregate of 1,479,188 shares of Invitae common stock which are issuable upon the exercise of outstanding Series F warrants.

Pursuant to the terms of the Series F warrants, shares of Invitae common stock will be issued to the warrant holder that elects to exercise and provide payment of the exercise price. We do not know if or when the any of the Series F warrants will be exercised. We also do not know whether any of the shares of Invitae common stock acquired upon exercise of any Series F warrants will subsequently be resold. We are not using an underwriter in connection with this offering.

LEGAL MATTERS

The validity of the common stock offered by this prospectus will be passed upon for us by Pillsbury Winthrop Shaw Pittman LLP.

EXPERTS

Ernst & Young LLP, independent registered public accounting firm, has audited our consolidated financial statements included in our Annual Report on Form 10-K for the year ended December 31, 2017, as set forth in their report, which is incorporated by reference in this prospectus and elsewhere in this registration statement. Our consolidated financial statements are incorporated by reference in reliance on Ernst & Young LLP's report, given on their authority as experts in accounting and auditing.

The consolidated financial statements of CombiMatrix Corporation as of December 31, 2016 and for the year then ended incorporated by reference in this prospectus have been incorporated by reference in reliance upon the report of Haskell & White LLP, an independent registered public accounting firm, and given on the authority of said firm as experts in accounting and auditing.

WHERE YOU CAN FIND MORE INFORMATION

We have filed a registration statement on Form S-3 with the SEC under the Securities Act. This prospectus is part of the registration statement but the registration statement includes and incorporates by reference additional information and exhibits. We file annual, quarterly and current reports, proxy statements and other information with the SEC. You may read and copy the registration statement and any other document we file with the SEC at the public reference room maintained by the SEC at 100 F Street, N.E., Washington, D.C. 20549. You may obtain information on the operation of the public reference room by calling the SEC at 1-800-SEC-0330. The SEC also maintains a website that contains reports, proxy and information statements and other information regarding companies, such as ours, that file documents electronically with the SEC. The address of that website is <http://www.sec.gov>. The information on the SEC's website is not part of this prospectus, and any references to this website or any other website are inactive textual references only.

Investors may also consult Invitae's website for more information about Invitae. Invitae's website is www.invitae.com. Information included on this website is not incorporated by reference into this prospectus.

INFORMATION INCORPORATED BY REFERENCE

The SEC allows us to "incorporate by reference" the information we file with it, which means that we can disclose important information to you by referring you to another document filed separately with the SEC. The information incorporated by reference is considered to be part of this prospectus, except for any information superseded by information contained directly in this prospectus or in later filed documents incorporated by reference in this prospectus. The following documents previously filed with the SEC are incorporated by reference (other than information in such filings deemed, under SEC rules or otherwise, not to have been filed with the SEC):

- our Annual Report on Form 10-K for the year ended December 31, 2017;
- our Current Reports on Form 8-K filed on November 15, 2017 (as amended on January 26, 2018 and March 6, 2018), February 28, 2018, March 13, 2018 and April 2, 2018;
- the description of our common stock contained in our Registration Statement on Form 8-A filed on February 11, 2015, including any amendment or report filed for the purpose of updating such description; and
- the section entitled "Risk Factors" contained in our Registration Statement on Form S-4 (Registration No. 333-220447) filed with the SEC on September 13, 2017, as amended, and any amendment or report filed for the purpose of updating such section.

In addition, all future filings we make with the SEC under Sections 13(a), 13(c), 14 or 15(d) of the Securities Exchange Act of 1934 that are made after the initial filing date of the registration statement of which this prospectus is a part and the effectiveness of the registration statement, as well as between the date of this prospectus and the termination of any offering of securities offered by this prospectus (other than information in such future filings deemed, under SEC rules or otherwise, not to have been filed with the SEC), shall be deemed to be incorporated by reference in this prospectus and to be a part hereof from the date of filing of such documents. Information filed with the SEC after the date of this prospectus will automatically update and supersede information contained in or previously incorporated by reference in this prospectus.

We will provide without charge to each person (including any beneficial owner) who receives a copy of this prospectus, upon the written or oral request of any such person, a copy of any or all of these filings (other than exhibits to such documents, unless that exhibit is specifically incorporated by reference to that filing). Requests should be directed to:

Invitae Corporation
Attention: Investor Relations
1400 16th Street, San Francisco, CA 94103.
Telephone: (415) 374-7782

* * *



PROSPECTUS

COMMON STOCK

INVITAE CORPORATION

PART II: INFORMATION NOT REQUIRED IN PROSPECTUS

Item 14. Other Expenses of Issuance and Distribution.

The following table sets forth the estimated expenses in connection with the offering described in this Registration Statement.

Securities and Exchange Commission filing fee	\$ —
Legal fees and expenses	20,000
Accounting fees and expenses	10,000
Printing and miscellaneous fees and expenses	5,000
	<u>35,000</u>

Invitae will pay all of the above fees and expenses. All expenses are estimated.

Item 15. Indemnification of Directors and Officers.

Section 102 of the Delaware General Corporation Law (the “DGCL”) allows a corporation to eliminate the personal liability of directors of a corporation to the corporation or its stockholders for monetary damages for breach of fiduciary duty as a director, except where the director breached the duty of loyalty, failed to act in good faith, engaged in intentional misconduct or knowingly violated a law, authorized the payment of a dividend or approved a stock repurchase in violation of the DGCL or obtained an improper personal benefit.

Section 145 of the DGCL provides, among other things, that we may indemnify any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action, suit or proceeding, other than an action by or in the right of the Registrant, by reason of the fact that the person is or was a director, officer, agent or employee of the Registrant, or is or was serving at our request as a director, officer, agent or employee of another corporation, partnership, joint venture, trust or other enterprise against expenses, including attorneys’ fees, judgments, fines and amounts paid in settlement actually and reasonably incurred by the person in connection with such action, suit or proceeding. The power to indemnify applies (a) if such person is successful on the merits or otherwise in defense of any action, suit or proceeding, or (b) if such person acting in good faith and in a manner he or she reasonably believed to be in the best interest, or not opposed to the best interest, of the Registrant, and with respect to any criminal action or proceeding had no reasonable cause to believe his or her conduct was unlawful. The power to indemnify applies to actions brought by or in the right of the Registrant as well but only to the extent of defense expenses, including attorneys’ fees but excluding amounts paid in settlement, actually and reasonably incurred and not to any satisfaction of judgment or settlement of the claim itself, and with the further limitation that in such actions no indemnification shall be made in the event of any adjudication of liability to the Registrant, unless the court believes that in light of all the circumstances indemnification should apply.

Section 174 of the DGCL provides, among other things, that a director, who willfully or negligently approves of an unlawful payment of dividends or an unlawful stock purchase or redemption, may be held liable for such actions. A director who was either absent when the unlawful actions were approved or dissented at the time, may avoid liability by causing his or her dissent to such actions to be entered in the books containing minutes of the meetings of the board of directors at the time such action occurred or immediately after such absent director receives notice of the unlawful acts.

The Registrant’s restated certificate of incorporation and amended and restated bylaws, filed as Exhibits 3.1 and 3.2 to the Registrant’ Current Report on Form 8-K filed on February 22, 2015, provide that the Registrant shall indemnify its directors, officers, employees and other agents to the fullest extent not prohibited by the DGCL or any other applicable law. In addition, the Registrant has entered into agreements with its directors and officers that require the Registrant, among other things, to indemnify the directors and officers against certain liabilities that may arise by reason of their status or service as directors or officers to the fullest extent not prohibited by law. These indemnification provisions and the indemnification agreements may be sufficiently broad to permit indemnification of the Registrant’s officers and directors for liabilities, including reimbursement of expenses incurred, arising under the Securities Act of 1933, as amended. The Registrant also intends to maintain director and officer liability insurance, if available on reasonable terms.

Item 16. Exhibits.

The exhibits listed below are filed or incorporated by reference as part of this Registration Statement.

Exhibit No.	Description
2.1@	<u>Agreement and Plan of Merger and Reorganization, dated as of July 31, 2017, by and among Invitae Corporation, CombiMatrix Corporation and Coronado Merger Sub, Inc. (incorporated by reference to Exhibit 2.1 to the Registrant's Current Report on Form 8-K filed August 1, 2017).</u>
3.1	<u>Restated Certificate of Incorporation of Invitae Corporation (incorporated by reference to Exhibit 3.1 to the Registrant's Current Report on Form 8-K filed February 23, 2015).</u>
3.1.1	<u>Certificate of Designation of Preferences, Rights and Limitations of Series A Convertible Preferred Stock of Invitae Corporation (incorporated by reference to Exhibit 3.1 to the Registrant's Current Report on Form 8-K filed August 1, 2017).</u>
3.2	<u>Amended and Restated Bylaws of Invitae Corporation (incorporated by reference to Exhibit 3.2 to the Registrant's Current Report on Form 8-K filed February 23, 2015).</u>
4.1	<u>Form of Invitae Corporation Series F Warrant (incorporated by reference to Exhibit 4.4 to the Registrant's Registration Statement on Form S-4 (File No. 333-220447), as amended, filed September 13, 2017).</u>
4.2	<u>Form of Invitae Corporation Series F Warrant Agent Agreement (incorporated by reference to Exhibit 4.5 to the Registrant's Registration Statement on Form S-4 (File No. 333-220447), as amended, filed September 13, 2017).</u>
5.1	<u>Opinion of Pillsbury Winthrop Shaw Pittman.</u>
23.1	<u>Consent of Pillsbury Winthrop Shaw Pittman LLP (included in Exhibit 5.1).</u>
23.2	<u>Consent of Independent Registered Public Accounting Firm.</u>
23.3	<u>Consent of Haskell & White LLP.</u>
24.1	<u>Powers of Attorney of the directors of Invitae (incorporated by reference to the signature page to the Registrant's Registration Statement on Form S-4 (File No. 333-220447), as amended, filed September 13, 2017).</u>

@ The schedules and exhibits to this agreement have been omitted pursuant to Item 601(b)(2) of Regulation S-K. A copy of any omitted schedule and/or exhibit will be furnished to the SEC upon request.

Item 17. 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 set forth 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 percent change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective registration statement; and

(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 (1)(i), (1)(ii) and (1)(iii) do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in periodic reports filed with or furnished to the Commission by the registrant pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 that are incorporated by reference in the registration statement, or is contained in a form of prospectus filed pursuant to Rule 424(b) that is part of 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.

(4) That, for the purpose of determining liability under the Securities Act of 1933 to any purchaser:

(i) each prospectus filed by a registrant pursuant to Rule 424(b)(3) shall be deemed to be part of the registration statement as of the date the filed prospectus was deemed part of and included in the registration statement; and

(ii) each prospectus required to be filed pursuant to Rule 424(b)(2), (b)(5), or (b)(7) as part of a registration statement in reliance on Rule 430B relating to an offering made pursuant to Rule 415(a)(1)(i), (vii) or (x) for the purpose of providing the information required by Section 10(a) of the Securities Act of 1933 shall be deemed to be part of and included in the registration statement as of the earlier of the date such form of prospectus is first used after effectiveness or the date of the first contract of sale of securities in the offering described in the prospectus. As provided in Rule 430B, for liability purposes of the issuer and any person that is at that date an underwriter, such date shall be deemed to be a new effective date of the registration statement relating to the securities in the registration statement to which that prospectus relates, and the offering of such securities at that time shall be deemed to be the initial *bona fide* offering thereof. *Provided, however*, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such effective date, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such effective date.

(5) That, for the purpose of determining liability of the registrant under the Securities Act of 1933 to any purchaser in the initial distribution of the securities, the undersigned registrant undertakes that in a primary offering of securities of the undersigned registrant pursuant to this registration statement, regardless of the underwriting method used to sell the securities to the purchaser, if the securities are offered or sold to such purchaser by means of any of the following communications the undersigned registrant will be a seller to the purchaser and will be considered to offer or sell such securities to such purchaser:

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- (i) any preliminary prospectus or prospectus of the undersigned registrant relating to the offering required to be filed pursuant to Rule 424;
 - (ii) any free writing prospectus relating to the offering prepared by or on behalf of the undersigned registrant or used or referred to by the undersigned registrant;
 - (iii) the portion of any other free writing prospectus relating to the offering containing material information about the undersigned registrant or its securities provided by or on behalf of the undersigned Registrant; and
 - (iv) any other communication that is an offer in the offering made by the undersigned registrant to the purchaser.

(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 15(d) of the Exchange Act (and, where applicable, each filing of an employee benefit plan's annual report pursuant to Section 15(d) of the Exchange Act) 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 indemnification 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.

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-3 and has duly caused this Post-Effective Amendment No. 2 on Form S-3 to Form S-4 Registration Statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the city of San Francisco, state of California, on April 20, 2018.

INVITAE CORPORATION

By: /s/ Sean E. George, Ph.D.

Name: Sean E. George, Ph.D.

Title: President and Chief Executive Officer

Pursuant to the requirements of the Securities Act of 1933, this Post-Effective Amendment No. 2 on Form S-3 to Form S-4 Registration Statement has been signed by the following persons in the capacities and on the dates indicated.

<u>Signature</u>	<u>Capacity</u>	<u>Date</u>
<u>/s/ Sean E. George, Ph.D.</u> Sean E. George, Ph.D.	President, Chief Executive Officer and Director <i>(Principal Executive Officer)</i>	April 20, 2018
<u>/s/ Shelly D. Guyer</u> Shelly D. Guyer	Chief Financial Officer <i>(Principal Financial Officer)</i>	April 20, 2018
<u>/s/ Patricia E. Dumond</u> Patricia E. Dumond	Chief Accounting Officer <i>(Principal Accounting Officer)</i>	April 20, 2018
<u>*</u> Randal W. Scott, Ph.D.	Executive Chairman of the Board	April 20, 2018
<u>*</u> Eric Aguiar, M.D.	Director	April 20, 2018
<u>*</u> Geoffrey S. Crouse	Director	April 20, 2018
<u>*</u> Christine M. Gorjanc	Director	April 20, 2018

*Pursuant to powers of attorney duly executed by such directors and filed with the U.S. Securities and Exchange Commission.

*By: /s/ Sean E. George, Ph.D.

Sean E. George, Ph.D.

Attorney-in-Fact



Pillsbury Winthrop Shaw Pittman LLP
12255 El Camino Real, Suite 300 | San Diego, CA 92130-4088 | tel 619.234.5000 | fax 858.509.4010

April 20, 2018

Invitae Corporation
1400 16th Street
San Francisco, CA 94103

Re: Post-Effective Amendment No. 2 on Form S-3 to
Form S-4 Registration Statement (File No. 333-220447)

Ladies and Gentlemen:

We are acting as counsel for Invitae Corporation, a Delaware corporation (the "Company"), in connection with Post-Effective Amendment No. 2 on Form S-3 to Form S-4 Registration Statement (the "Registration Statement") relating to the registration under the Securities Act of 1933 (the "Act") of 1,479,188 shares (the "Shares") of the Company's common stock, \$0.0001 par value per share, to be issued upon the exercise of outstanding and unexercised Series F warrants (the "Warrants") assumed by the Company in connection with the merger contemplated by the Agreement and Plan of Merger, dated as of July 31, 2017, by and among the Company, CombiMatrix Corporation and Coronado Merger Sub, Inc.

We have reviewed and are familiar with such corporate proceedings and other matters as we have considered relevant or necessary for the opinions expressed in this letter. Based upon the foregoing, we are of the opinion that the Shares have been duly authorized and, if issued on the date hereof upon exercise of the Warrants in accordance with the terms of the Warrants, would be validly issued, fully paid and nonassessable. The opinions set forth in this letter are limited to the General Corporation Law of the State of Delaware, as in effect on the date hereof.

We hereby consent to the filing of this opinion letter as Exhibit 5.1 to the Registration Statement and to the use of our name under the caption "Legal Matters" in the Registration Statement and in the Prospectus included therein. In giving this consent, we do not thereby admit that we are within the category of persons whose consent is required under Section 7 of the Act or the rules and regulations of the Securities and Exchange Commission promulgated thereunder.

Very truly yours,

/s/ Pillsbury Winthrop Shaw Pittman LLP

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the reference to our firm under the captions “Experts” in the Post-Effective Amendment No. 2 on Form S-3 to Form S-4 Registration Statement (Form S-4 No. 333-220447) and related Prospectus of Invitae Corporation for the registration of 1,479,188 shares of its common stock and to the incorporation by reference therein of our report dated March 5, 2018, with respect to the consolidated financial statements of Invitae Corporation included in its Annual Report (Form 10-K), for the year ended December 31, 2017, filed with the Securities and Exchange Commission.

/s/ Ernst & Young LLP

Redwood City, California

April 20, 2018

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference into Post-Effective Amendment No. 2 on Form S-3 to Form S-4 Registration Statements (No. 333-220447) of Invitae Corporation of our report dated March 3, 2017, related to our audit of CombiMatrix Corporation's (the "Company") consolidated financial statements as of December 31, 2016 and for the year then ended, included in the Company's Annual Report on Form 10-K for the year ended December 31, 2016 which appears in the Current Report on Form 8-K/A of Invitae Corporation filed on January 26, 2018. We also consent to the reference to our Firm under the heading "Experts" in the Post-Effective Amendment No. 2 on Form S-3 to Form S-4 Registration Statement and the related prospectus.

/s/ HASKELL & WHITE LLP

Irvine, California
April 20, 2018