

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

**FORM S-3
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, CA 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, CA 94103
(415) 374-7782
(Name, address, including zip code, and telephone number, including area code, of agent for service)

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Approximate date of commencement of proposed sale to the public : From time to time after this registration statement becomes effective, as determined by market conditions and other factors.

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, or a smaller reporting company. See the definitions of "large accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer	<input type="checkbox"/>	Accelerated filer	<input checked="" type="checkbox"/>
Non-accelerated filer	<input type="checkbox"/> (Do not check if a smaller reporting company)	Smaller reporting company	<input type="checkbox"/>
		Emerging growth company	<input checked="" type="checkbox"/>

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 Securities Act.

CALCULATION OF REGISTRATION FEE

Title of Each Class 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
Common Stock, \$0.0001 par value per share	5,188,235 shares	\$9.58	\$49,703,291.30	\$5,760.61

(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) Estimated solely for the purpose of calculating the registration fee pursuant to Rule 457(c) under the Securities Act of 1933 based on the average of the high and low prices of the Registrant's Common Stock on The New York Stock Exchange on August 14, 2017.

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 or until the registration statement shall become effective on such date as the Commission, acting pursuant to said Section 8(a), may determine.

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

Subject To Completion, Dated August 18, 2017

PROSPECTUS

5,188,235 Shares



Invitae Corporation

Common Stock

The selling stockholders identified in this prospectus may sell up to an aggregate of 5,188,235 shares of our common stock. We will not receive any of the proceeds from the sale of the shares of our common stock by the selling stockholders.

Our registration of the shares of our common stock covered by this prospectus does not mean that the selling stockholders will offer or sell any of the shares of our common stock. The selling stockholders identified in this prospectus may sell the shares of our common stock covered by this prospectus in a number of different ways and at varying prices. For additional information on the possible methods of sale that may be used by the selling stockholders, you should refer to the information under the heading “Plan of Distribution” on page 6 of this prospectus.

Our common stock is listed on The New York Stock Exchange under the symbol “NVTA.” On August 18, 2017, the last reported sale price of our common stock on The New York Stock Exchange was \$9.60 per share.

Investing in our securities involves risks. See the section entitled “[Risk Factors](#)” included or incorporated by reference into this prospectus and in the other documents we incorporate by reference into this prospectus before making an investment decision.

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

The date of this prospectus is _____, 2017

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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.

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.

When we refer to the selling stockholders in this prospectus, we are referring to the stockholders identified in the table under the heading “Selling Stockholders” herein as well as any donees, pledgees, transferees or other successors-in-interest that received shares of our common stock after the date of this prospectus from the selling stockholders pursuant to a gift, a pledge, a partnership distribution or other transfer (other than a public sale).

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.

RISK FACTORS

Investing in our securities involves risk. Prior to making a decision about investing in our common stock, you should carefully consider all of the information appearing or incorporated by reference in this prospectus, including the risk factors incorporated by reference to our most recent Annual Report on Form 10-K, Quarterly Reports on Form 10-Q and Current Reports on Form 8-K, as well as any prospectus supplement to this prospectus. The occurrence of any of these risks or additional risks and uncertainties might cause you to lose all or part of your investment in our common stock.

INVITAE CORPORATION

Invitae Corporation is a genetic information company whose mission is to bring comprehensive genetic information into mainstream medical practice to improve the quality of healthcare for billions of people.

We were incorporated in the state of Delaware on January 13, 2010, as Locus Development, Inc. and changed our name to Invitae Corporation in 2012. Our principal executive offices are located at 1400 16th Street, San Francisco, California 94103 and our telephone number is (415) 374-7782. Our website address is www.invitae.com. We do not incorporate the information on, or accessible through, our website into this prospectus, and you should not consider any information on, or accessible through, our website as part of this prospectus.

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. We will discuss many of these risks and uncertainties in greater detail in any prospectus supplement under the heading “Risk Factors.” 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 may also be contained in the documents we incorporate by reference into this prospectus.

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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 statement is 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 Securities and Exchange Commission, or SEC.

USE OF PROCEEDS

We will not receive any proceeds from the sale of common stock by the selling stockholders. All proceeds from the sale of the shares will be for the accounts of the selling stockholders. See “Selling Stockholders” and “Plan of Distribution.”

SELLING STOCKHOLDERS

On August 3, 2017, we sold to the selling stockholders 5,188,235 shares of our common stock in a private placement, pursuant to a securities purchase agreement with the selling stockholders. The registration statement to which this prospectus relates is being filed pursuant to a registration rights agreement we entered into with the selling stockholders to register the shares of our common stock sold in the private placement.

The following table sets forth, to our knowledge, certain information as of August 10, 2017 regarding the beneficial ownership of our common stock by the selling stockholders and the shares being offered by the selling stockholders. Beneficial ownership has been determined in accordance with the rules of the SEC. Information with respect to beneficial ownership is based upon information obtained from the selling stockholders. Information with respect to shares owned beneficially after the offering assumes the sale of all of the shares offered and no other purchases or sales of our common stock. The selling stockholders may offer and sell some, all or none of their shares.

Name and Address	Shares Beneficially Owned Prior to Offering (1)		Shares Being Offered	Shares Beneficially Owned After Offering (1)	
	Number	Percent	Number	Number	Percent
Entities affiliated with Redmile Group (2)	2,112,240	4.3%	1,300,000	812,240	1.7%
Perceptive Life Sciences Master Fund Ltd. (3)	1,869,500	3.8%	1,180,000	689,500	1.4%
Deerfield Partners, L.P. (4)	531,000	1.1%	531,000	—	—
Deerfield International Master Fund, L.P. (4)	369,000	*	369,000	—	—
Entities affiliated with Acuta Capital (5)	450,000	*	450,000	—	—
OrbiMed Private Investments V, L.P. (6)	806,666	1.7%	350,000	456,666	*
Broadfin Healthcare Master Fund, Ltd. (7)	235,500	*	235,500	—	—
Stonepine Capital, L.P. (8)	235,500	*	235,500	—	—
Prelude Opportunity Fund, LP (9)	149,480	*	111,638	37,842	*
Entities affiliated with Asymmetry Capital (10)	144,339	*	108,362	35,977	*
Rock Springs Capital Master Fund LP (11)	1,306,000	2.7%	105,885	1,200,115	2.5%
Monashee Capital Master Fund LP (12)	105,675	*	105,675	—	—
Victory RS Science Technology Fund (13)	105,675	*	105,675	—	—

* Represents less than 1%.

(1) Based on 48,811,243 shares of our common stock outstanding on August 10, 2017.

(2) Includes (i) 556,900 shares held by Redmile Capital Offshore Fund, Ltd., (ii) 320,900 shares held by Redmile Capital Fund, LP, (iii) 283,200 shares held by Redmile Long Only Master Fund, LP, (iv) 64,900 shares held by P Redmile Ltd., (v) 47,600 shares held by Redmile Capital Offshore Fund (ERISA), Ltd.

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and (vi) 26,500 shares held by Redmile Special Opportunities Fund, Ltd. Also includes an aggregate of 812,240 shares beneficially owned prior to offering consisting of (a) 465,535 shares held by Redmile Private Investments I, L.P. and (b) 346,705 shares held by Redmile Private Investments I Affiliates, L.P., which shares are not being offered hereby. Redmile Group, LLC is the investment manager of each of the private investment vehicles and separately managed accounts listed in this footnote (2) and, in such capacity, exercises sole voting and investment power over all of the shares held by such vehicles and accounts and may be deemed to be the beneficial owner of these shares. Jeremy Green serves as the managing member of Redmile Group, LLC and also may be deemed to be the beneficial owner of these shares. Redmile Group, LLC and Mr. Green each disclaims beneficial ownership of these shares, except to the extent of its or his pecuniary interest in such shares, if any.

- (3) Perceptive Advisors, LLC is the investment advisor of Perceptive Life Sciences Master Fund Ltd. Joseph E. Edelman, as the General Partner of Perceptive Advisors, LLC, has voting and investment power over all of the shares held by Perceptive Life Sciences Master Fund Ltd.
- (4) Deerfield Mgmt, L.P. is the general partner of each of Deerfield Partners, L.P. and Deerfield International Master Fund, L.P. Deerfield Management Company, L.P. is the investment manager of each of Deerfield Partners, L.P. and Deerfield International Master Fund, L.P. Mr. James E. Flynn is the sole member of the general partner of each of Deerfield Mgmt, L.P. and Deerfield Management Company, L.P. Each of Deerfield Mgmt, L.P., Deerfield Management Company, L.P. and Mr. James E. Flynn may be deemed to beneficially own all of the shares held by Deerfield Partners, L.P. and Deerfield International Master Fund, L.P.
- (5) Consists of (i) 355,500 shares held by Acuta Capital Fund, LP and (ii) 94,500 shares held by Acuta Opportunity Fund, LP. Richard Lin is the Managing Member of Acuta Capital Partners, LLC, the general partner of Acuta Capital Fund, LP and Acuta Opportunity Fund, LP, and has voting and investment power over all of the shares held by Acuta Capital Fund, LP and Acuta Opportunity Fund, LP. Mr. Lin disclaims beneficial ownership over all of the shares held by Acuta Capital Fund, LP and Acuta Opportunity Fund, LP, except to the extent of his pecuniary interest in such shares.
- (6) OrbiMed Capital GP V LLC (“GP V”) is the general partner of OrbiMed Private Investments V, LP (“OPI V”). OrbiMed Advisors LLC (“OrbiMed”) is the managing member of GP V. Samuel D. Isaly is the managing member of and owner of a controlling interest in OrbiMed. By virtue of such relationships, GP V, OrbiMed and Mr. Isaly may be deemed to have voting and investment power over all of the shares held by OPI V. Each of GP V, OrbiMed and Mr. Isaly disclaims beneficial ownership of the shares held by OPI V, except to the extent of its or his pecuniary interest in such shares, if any.
- (7) Broadfin Capital, LLC serves as investment adviser to Broadfin Healthcare Master Fund, Ltd. with the power to direct investments and/or sole power to vote the shares owned by Broadfin Healthcare Master Fund, Ltd. Kevin Kotler is the Managing Member of Broadfin Capital, LLC. Mr. Kotler has voting and investment power over all of the shares held by Broadfin Healthcare Master Fund, Ltd. Mr. Kotler disclaims beneficial ownership of all shares beneficially owned, except to the extent of his pecuniary interests in such shares.
- (8) Stonepine Capital Management, LLC is the general partner of Stonepine Capital, L.P. Jon M. Plexico and Timothy P. Lynch, the managing members of Stonepine Capital Management, LLC, have voting and investment power over all of the shares held by Stonepine Capital, L.P. and disclaim beneficial ownership of such shares, except to the extent of their pecuniary interest in such shares.
- (9) Prelude Capital Partners, LLC is the general partner of Prelude Opportunity Fund, LP. Cisco J. del Valle and Gavin Saitowitz, as managing members of Prelude Capital Partners, LLC, have voting and investment power over all of the shares held by Prelude Opportunity Fund, LP.
- (10) Includes (i) 100,573 shares held by Asymmetry Global Healthcare Fund, L.P. and (ii) 7,789 shares held by Asymmetry Global Healthcare (Master) Fund, LP. Also includes an aggregate of 35,977 shares beneficially owned prior to the offering consisting of (a) 33,395 shares held by Asymmetry Global Healthcare Fund, L.P. and (b) 2,582 shares held by Asymmetry Global Healthcare (Master) Fund, LP, which shares are not being offered hereby. Scott Kay and Chris Zellner have voting and investment power over all of the shares held by Asymmetry Global Healthcare Fund, L.P. and Asymmetry Global Healthcare (Master) Fund, LP.

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- (11) Rock Springs General Partner LLC is the general partner of Rock Springs Capital Master Fund LP and Kris Jenner, Mark Bussard and Graham McPhail are the managing members of Rock Springs General Partner LLC. Rock Springs General Partner LLC and Messrs. Jenner, Bussard and McPhail, as managing members of Rock Springs General Partner LLC, may be deemed to have shared voting and dispositive power over the shares owned by Rock Springs Capital Master Fund LP.
- (12) Monashee Investment Management LLC, as the general partner of Monashee Capital Master Fund LP, has voting and investment power over all of the shares held by Monashee Capital Master Fund LP.
- (13) Victory Capital Management Inc. serves as investment adviser to the Victory RS Science Technology Fund with voting and investment power over the shares held by Victory RS Science Technology Fund.

PLAN OF DISTRIBUTION

We are registering the shares of common stock issued to the selling stockholders to permit the resale of these shares of common stock by the holders of the shares of common stock from time to time after the date of this prospectus. We will not receive any of the proceeds from the sale by the selling stockholders of the shares of common stock. We will bear all fees and expenses incident to our obligation to register the shares of common stock. There can be no assurance that any selling stockholder will sell any or all of the shares of common stock registered pursuant to the registration statement, of which this prospectus forms a part.

The selling stockholders, which as used herein includes donees, pledgees, transferees or other successors-in-interest selling shares of common stock received after the date of this prospectus from a selling stockholder as a gift, pledge, partnership distribution or other transfer, may, from time to time, sell any or all of their shares of common stock on any stock exchange, market or trading facility on which the shares are traded or in private transactions directly or through one or more underwriters, broker dealers or agents. If the shares of common stock are sold through underwriters or broker-dealers, the selling stockholders will be responsible for underwriting discounts or commissions or agent's commissions. Dispositions may be at fixed prices, at prevailing market prices at the time of sale, at prices related to the prevailing market price, at varying prices determined at the time of sale, or at negotiated prices. These sales may be effected in transactions which may involve crosses or block transactions.

The selling stockholders may use any one or more of the following methods when disposing of shares or interests therein:

- ordinary brokerage transactions and transactions in which the broker-dealer solicits purchasers;
- block trades in which the broker-dealer will attempt to sell the shares as agent, but may position and resell a portion of the block as principal to facilitate the transaction;
- purchases by a broker-dealer as principal and resale by the broker-dealer for its account;
- an exchange distribution in accordance with the rules of the applicable exchange;
- privately negotiated transactions;
- short sales effected after the date the registration statement of which this prospectus is a part is declared effective by the SEC;
- through the writing or settlement of options or other hedging transactions, whether through an options exchange or otherwise;
- broker-dealers may agree with the selling stockholders to sell a specified number of such shares at a stipulated price per share;
- a combination of any such methods of sale; and
- any other method permitted by applicable law.

The selling stockholders may, from time to time, pledge or grant a security interest in some or all of the shares of common stock owned by them and, if they default in the performance of their secured obligations, the pledgees or secured parties may offer and sell the shares of common stock, from time to time, under this prospectus, or under an amendment to this prospectus under Rule 424(b)(3) or other applicable provision of the Securities Act of 1933, as amended (the "Securities Act"), amending the list of selling stockholders to include the pledgee, transferee or other successors in interest as selling stockholders under this prospectus. The selling stockholders also may transfer the shares of common stock in other circumstances, in which case the transferees, pledgees or other successors in interest will be the selling beneficial owners for purposes of this prospectus.

In connection with the sale of our common stock or interests therein, the selling stockholders may enter into hedging transactions with broker-dealers or other financial institutions, which may in turn engage in short sales

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of the common stock in the course of hedging the positions they assume. The selling stockholders may also sell shares of our common stock short and if such short sale shall take place after the date that the registration statement of which this prospectus forms a part is declared effective by the SEC, the selling stockholders may deliver shares of common stock covered by this prospectus to close out short positions and to return borrowed shares in connection with such short sales. The selling stockholders may also enter into option or other transactions with broker-dealers or other financial institutions or the creation of one or more derivative securities which require the delivery to such broker-dealer or other financial institution of shares offered by this prospectus, which shares such broker-dealer or other financial institution may resell pursuant to this prospectus (as supplemented or amended to reflect such transaction). Notwithstanding the foregoing, the selling stockholders have been advised that they may not use shares registered on the registration statement to cover short sales of our common stock made prior to the date the registration statement, of which this prospectus forms a part, has been declared effective by the SEC.

The aggregate proceeds to the selling stockholders from the sale of the common stock offered by them will be the purchase price of the common stock less discounts or commissions, if any. Each of the selling stockholders reserves the right to accept and, together with their agents from time to time, to reject, in whole or in part, any proposed purchase of common stock to be made directly or through agents.

The selling stockholders also may resell all or a portion of the shares in open market transactions in reliance upon Rule 144 under the Securities Act of 1933, provided that they meet the criteria and conform to the requirements of that rule.

The selling stockholders and any underwriters, broker-dealers or agents that participate in the sale of the common stock or interests therein may be deemed to be “underwriters” within the meaning of Section 2(11) of the Securities Act. Any discounts, commissions, concessions or profit they earn on any resale of the shares may be deemed to be underwriting discounts and commissions under the Securities Act. Selling stockholders who are “underwriters” within the meaning of Section 2(11) of the Securities Act will be subject to the prospectus delivery requirements of the Securities Act, including Rule 172 thereunder and may be subject to certain statutory liabilities of, including but not limited to, Sections 11, 12 and 17 of the Securities Act and Rule 10b-5 under the Securities Exchange Act of 1934, as amended, or the Exchange Act.

To the extent required, the shares of our common stock to be sold, the names of the selling stockholders, the respective purchase prices and public offering prices, the names of any agents, dealer or underwriter, and any applicable commissions or discounts with respect to a particular offer will be set forth in an accompanying prospectus supplement or, if appropriate, a post-effective amendment to the registration statement that includes this prospectus.

In order to comply with the securities laws of some states, if applicable, the common stock may be sold in these jurisdictions only through registered or licensed brokers or dealers.

Each selling stockholder and any other person participating in such distribution will be subject to applicable provisions of the Exchange Act and the rules and regulations thereunder, including, without limitation, to the extent applicable, Regulation M of the Exchange Act, which may limit the timing of purchases and sales of any of the shares of common stock by the selling stockholder and any other participating person. To the extent applicable, Regulation M may also restrict the ability of any person engaged in the distribution of the shares of common stock to engage in market-making activities with respect to the shares of common stock. All of the foregoing may affect the marketability of the shares of common stock and the ability of any person or entity to engage in market-making activities with respect to the shares of common stock.

To the extent applicable, we will make copies of this prospectus (as it may be supplemented or amended from time to time) available to the selling stockholders for the purpose of satisfying the prospectus delivery requirements of the Securities Act. The selling stockholders may indemnify any broker-dealer that participates in

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transactions involving the sale of the shares against certain liabilities, including liabilities arising under the Securities Act.

Broker dealers engaged by the selling stockholders may arrange for other broker dealers to participate in sales. If the selling stockholders effect such transactions by selling shares of common stock to or through underwriters, broker dealers or agents, such underwriters, broker-dealers or agents may receive commissions in the form of discounts, concessions or commissions from the selling stockholders or commissions from purchasers of the shares of common stock for whom they may act as agent or to whom they may sell as principal. Such commissions will be in amounts to be negotiated, but, except as set forth in a supplement to this prospectus, in the case of an agency transaction will not be in excess of a customary brokerage commission in compliance with FINRA Rule 2440; and in the case of a principal transaction a markup or markdown in compliance with FINRA IM-2440.

We have agreed to indemnify the selling stockholders against liabilities, including liabilities under the Securities Act and state securities laws, relating to the registration of the shares offered by this prospectus.

We have agreed with the selling stockholders to keep the registration statement of which this prospectus constitutes a part effective until the earlier of (1) such time as all of the shares covered by this prospectus held by non-affiliates have been sold pursuant to and in accordance with such registration statement or (2) the date on which all of the shares may be sold by non-affiliates without restriction pursuant to Rule 144 of the Securities Act.

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, as amended, for the year ended December 31, 2016, 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.

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.

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The SEC permits us to “incorporate by reference” the information contained in documents we file with the SEC, which means that we can disclose important information to you by referring you to those documents rather than by including them in this prospectus. Information that is incorporated by reference is considered to be part of this prospectus and you should read it with the same care that you read this prospectus. Later information that we file with the SEC will automatically update and supersede the information that is either contained, or incorporated by reference, in this prospectus, and will be considered to be a part of this prospectus from the date those documents are filed. We have filed with the SEC, and incorporate by reference in this prospectus:

- our Annual Report on Form 10-K for the year ended December 31, 2016, as amended by Amendment No. 1 to Form 10-K filed with the SEC on June 23, 2017 and Amendment No. 2 to Form 10-K filed with the SEC on June 26, 2017;
- our Quarterly Reports on Form 10-Q for the quarters ended March 31, 2017 and June 30, 2017;
- our Current Reports on Form 8-K filed with the SEC on January 6, 2017, January 9, 2017, February 9, 2017, May 19, 2017, June 1, 2017, June 13, 2017, August 1, 2017, August 4, 2017 and August 7, 2017; and
- 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.

We also incorporate by reference all additional documents that we file with the SEC under the terms of Section 13(a), 13(c), 14 or 15(d) of the Exchange Act 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. We are not, however, incorporating, in each case, any documents or information that we are deemed to furnish and not file in accordance with SEC rules.

You may request a copy of any or all of the documents incorporated by reference but not delivered with this prospectus, at no cost, by writing or telephoning us at the following address and number: Investor Relations, Invitae Corporation, 1400 16th Street, San Francisco, California 94103 and (415) 374-7782. We will not, however, send exhibits to those documents, unless the exhibits are specifically incorporated by reference in those documents.

We make available free of charge on our website our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and amendments to those reports, as soon as reasonably practicable after we electronically file or furnish such materials to the SEC. You may also obtain a free copy of these reports in the Investor Relations section of our website, www.invitae.com.

PART II
Information Not Required In Prospectus

Item 14. Other Expenses of Issuance and Distribution.

The following is a statement of estimated expenses in connection with the issuance and distribution of the securities being registered, other than brokerage or underwriting discounts and commissions. All expenses and all brokerage or underwriting discounts and commissions will be paid by the selling stockholders.

SEC registration fee	\$ 5,761
Legal fees and expenses	250,000*
Accounting fees and expenses	50,000*
Printing and miscellaneous fees and expenses	\$ 5,239*
	<u>\$ 311,000*</u>

* Amounts 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

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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 list of exhibits in the Exhibit Index to this registration statement is incorporated herein by reference.

Item 17. Undertakings .

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 Securities and Exchange 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 (i), (ii) and (iii) above do 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 Securities and Exchange Commission by the Registrant pursuant to Section 13 or Section 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:

(A) Each prospectus filed by the 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

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(B) 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 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.

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 any charter provision, by law 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 Securities Act of 1933 and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than 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 Securities 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 Registration Statement to be signed on its behalf by the undersigned, thereunto duly authorized in the City of San Francisco, State of California, on August 18, 2017.

INVITAE CORPORATION

By: / S / S E A N E . G E O R G E , P H . D .
Sean E. George, Ph.D.
President and Chief Executive Officer

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below hereby constitutes and appoints Sean E. George, Ph.D., Shelly D. Guyer and Patricia E. Dumond, and each of them, his or her true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him or her and in his or her name, place and stead, in any and all capacities, to sign any and all amendments, including post-effective amendments, to this Registration Statement, and any registration statement relating to the offering covered by this Registration Statement and filed pursuant to Rule 462(b) under the Securities Act of 1933, and to file the same, with exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done, as fully for all intents and purposes as he or she might or could do in person, hereby ratifying and confirming all that each of said attorneys in fact and agents or their substitute or substitutes may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act of 1933, this Registration Statement has been signed by the following persons in the capacities and on the dates indicated.

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/ S / S E A N E . G E O R G E , P H . D .</u> Sean E. George, Ph.D.	President and Chief Executive Officer (Principal Executive Officer) and Director	August 18, 2017
<u>/ S / S H E L L Y D . G U Y E R</u> Shelly D. Guyer	Chief Financial Officer (Principal Financial Officer)	August 18, 2017
<u>/ S / P A T R I C I A E . D U M O N D</u> Patricia E. Dumond	Chief Accounting Officer (Principal Accounting Officer)	August 18, 2017
<u>/ S / R A N D A L W . S C O T T , P H . D .</u> Randal W. Scott, Ph.D.	Chairman of the Board of Directors	August 18, 2017
<u>/ S / E R I C A G U I A R , M . D .</u> Eric Aguiar, M.D.	Director	August 18, 2017
<u>/ S / G E O F F R E Y S . C R O U S E</u> Geoffrey S. Crouse	Director	August 18, 2017
<u>/ S / C H R I S T I N E M . G O R J A N C</u> Christine M. Gorjanc	Director	August 18, 2017

EXHIBIT INDEX

<u>Exhibit No.</u>	<u>Description</u>
4.1	Registration Rights Agreement, dated as of July 31, 2017 (incorporated by reference to Exhibit 10.2 to the Registrant's Current Report on Form 8-K filed with the SEC on August 1, 2017).
5.1	Opinion of Pillsbury Winthrop Shaw Pittman LLP.
23.1	Consent of Pillsbury Winthrop Shaw Pittman LLP (included in Exhibit 5.1).
23.2	Consent of Independent Registered Public Accounting Firm.
24.1	Power of Attorney (included on the signature page hereof).

PILLSBURY WINTHROP SHAW PITTMAN LLP
2550 Hanover Street
Palo Alto, CA 94304-1115

August 18, 2017

Invitae Corporation
1400 16th Street
San Francisco, California 94103

Re: Registration Statement on Form S-3

Ladies and Gentlemen:

We are acting as counsel for Invitae Corporation, a Delaware corporation (the "Company"), in connection with the Registration Statement on Form S-3 relating to the registration under the Securities Act of 1933 (the "Act") of 5,188,235 shares of common stock, \$0.0001 par value per share (the "Common Stock"), of the Company, all of which are to be offered and sold by certain stockholders of the Company (the "Selling Stockholders"). Such Registration Statement, as amended, is herein referred to as the "Registration Statement."

We have reviewed and are familiar with such documents, corporate proceedings and other matters as we have considered relevant or necessary as a basis for the opinions expressed in this letter. Based upon the foregoing, and subject to the other qualifications and limitations set forth herein, we are of the opinion that the shares of Common Stock to be offered and sold by the Selling Stockholders have been duly authorized and validly issued and are 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 Registration Statement (Form S-3) and related Prospectus of Invitae Corporation for the registration of 5,188,235 shares of its common stock and to the incorporation by reference therein of our report dated March 16, 2017, with respect to the consolidated financial statements of Invitae Corporation included in its Annual Report (Form 10-K), as amended, for the year ended December 31, 2016, filed with the Securities and Exchange Commission.

/s/ Ernst & Young LLP

Redwood City, California
August 17, 2017