As filed with the Securities and Exchange Commission on June 18, 2019

Registration No. 333-232023

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

Amendment No. 1 to
FORM S-1

REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933

GENOCEA BIOSCIENCES, INC.

(Exact name of registrant as specified in its charter)

Delaware	**2836**	**51-0596811**
(State or other jurisdiction of incorporation or organization)	(Primary Standard Industrial Classification Code Number)	(I.R.S. Employer Identification Number)

100 Acorn Park Drive
Cambridge, MA 02140
(617) 876-8191
(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

William D. Clark
President & Chief Executive Officer
100 Acorn Park Drive
Cambridge, MA 02140
(617) 876-8191
(Name, address, including zip code, and telephone number, including area code, of agent for service)

Copies to:

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Approximate date of commencement of proposed sale to public: As soon as practicable after this Registration Statement is declared effective.

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, 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 post-effective amendment filed pursuant to Rule 462(d) 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. ☐

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 ☐	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 financing 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(1)	Proposed Maximum Offering Price Per Share(2)	Proposed Maximum Aggregate Offering Price(2)	Amount of Registration Fee
Common Stock, $0.001 par value per share	11,500,000	$5.31	$61,065,000	$7,401.08

(**1**) Includes shares that the underwriters have the option to purchase.

(**2**) Estimated solely for the purpose of calculating the registration fee pursuant to Rule 457(c) under the Securities Act of 1933, as amended, and based on the average of the high and low sales price of the registrant's common stock as reported on The Nasdaq Capital Market on June 17, 2019.

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 the Securities and Exchange Commission is effective. This prospectus is not an offer to sell these securities and it is not soliciting an offer to buy these securities in any state where the offer or sale is not permitted.

SUBJECT TO COMPLETION, DATED JUNE 18, 2019

PRELIMINARY PROSPECTUS

10,000,000 Shares

Common Stock

We are offering 10,000,000 shares of our common stock in this offering.

Our common stock is listed on The Nasdaq Capital Market under the symbol "GNCA". On June 17, 2019, the last sale price on our common stock was $5.38 per share.

We are an "emerging growth company" as that term is used in the Jumpstart Our Business Startups Act of 2012 and, as such, have elected to comply with certain reduced public company reporting requirements for this prospectus and future filings. See "Summary—Implications of Being an Emerging Growth Company."

Investing in our common stock involves risk. See "Risk Factors" beginning on page 7.

	Per share	Total
Public Offering Price	$	$
Underwriting Discounts and Commissions(1)	$	$
Proceeds to Genocea (before expenses)	$	$

(1) We refer you to "Underwriting" beginning on page 29 for additional information regarding underwriting compensation.

We have granted the underwriters an option to purchase up to 1,500,000 additional shares of common stock at the public offering price less the underwriting discount. The underwriters can exercise this option at any time within 30 days after the date of this prospectus.

Certain of our existing stockholders and their affiliated entities, including holders of more than 5% of our common stock, have indicated an interest in purchasing an aggregate of up to approximately $24.2 million in shares of our common stock in this offering at the public offering price per share and on the same terms as the other purchasers in this offering. However, because indications of interest are not binding agreements or commitments to purchase, the underwriters could determine to sell more, less or no shares to any of these existing stockholders and any of these existing stockholders could determine to purchase more, less or no shares in this offering. The underwriters will receive the same underwriting discounts and commissions on these shares as they will on any other shares sold to the public in this offering.

The underwriters expect to deliver the shares of common stock to investors on or about , 2019 through the book entry facilities of The Depositary Trust Company.

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

Joint Book-Running Managers

SVB Leerink **Stifel**

Co-Managers

Baird **Needham & Company**

The date of this prospectus is , 2019

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You should rely only on the information contained in this prospectus or contained in any free writing prospectus filed with the Securities and Exchange Commission. Neither we nor the underwriters have authorized anyone to provide you with additional information or information different from that contained in this prospectus or in any free writing prospectus filed with the Securities and Exchange Commission. We are offering to sell, and seeking offers to buy, our common stock only in jurisdictions where offers and sales are permitted. The information contained in this prospectus is accurate only as of the date of this prospectus, regardless of the time of delivery of this prospectus, or of any sale of our common stock.

For investors outside the United States: We have not, and the underwriters have not, done anything that would permit this offering or possession or distribution of this prospectus in any jurisdiction where action for that purpose is required, other than in the United States. Persons outside the United States who come into possession of this prospectus must inform themselves about, and observe any restrictions relating to, the offering of the shares of our common stock and the distribution of this prospectus outside the United States.

SUMMARY

This summary highlights information contained in other parts of this prospectus or incorporated by reference into this prospectus from our Annual Report on Form 10-K for the year ended December 31, 2018, our Quarterly Report on Form 10-Q for the quarter ended March 31, 2019 and our other filings with the Securities and Exchange Commission (the "SEC") listed in the section of this prospectus entitled "Incorporation of Documents By Reference" and does not contain all of the information that you should consider in making your investment decision. Before investing in our common stock, you should also consider, among other things, the matters described under "Risk Factors" and "Management's Discussion and Analysis of Financial Condition and Results of Operations," appearing elsewhere in this prospectus, in our Annual Report on Form 10-K for the year ended December 31, 2018 or in our Quarterly Report on Form 10-Q for the quarter ended March 31, 2019, incorporated by reference herein. Unless the context requires otherwise, references in this prospectus to "Genocea", "we", "us" and "our" refer to Genocea Biosciences, Inc.

Overview

We are a biopharmaceutical company that discovers and develops novel cancer immunotherapies using the ATLAS™ proprietary discovery platform. The ATLAS platform profiles each patient's $CD4^+$ and $CD8^+$ T cell immune responses to every potential target or "antigen" in that patient's tumor. We believe that this approach optimizes antigen selection for cancer vaccines and cellular therapies, because it identifies antigens to which a patient's T cells already mount anti-tumor responses. We believe that ATLAS could lead to more immunogenic and efficacious cancer immunotherapies.

Our most advanced program is GEN-009, a personalized neoantigen cancer vaccine, for which we are conducting a Phase 1/2a clinical trial. The GEN-009 program uses ATLAS to identify neoantigens, or immunogenic tumor mutations unique to each patient, for inclusion in each patient's GEN-009 vaccine. We are also advancing GEN-011, a neoantigen-specific adoptive T cell therapy program, as well as GEN-010, a next-generation neoantigen vaccine program.

ATLAS Platform

Harnessing and directing the T cell arm of the immune system to kill tumor cells is increasingly viewed as having potential in the treatment of many cancers, and this approach has shown efficacy in hematologic malignancies. Vaccines or cellular therapies employing this approach must target specific differences from normal tissue present in a tumor, such as genetic mutations. However, the discovery of such antigens has been particularly challenging for two reasons. First, the genetic diversity of human T cell responses means that effective antigens vary from person to person. Second, the number of candidate antigens can be very large, with up to thousands of candidates per patient in some cancers.

We have designed the ATLAS platform to overcome these antigen discovery challenges. We believe that ATLAS represents the most comprehensive, accurate, and high-throughput system for antigen discovery in the biopharmaceutical industry. ATLAS employs components of the T cell arm of the human immune system from each patient that it profiles in a laboratory setting. Using ATLAS, we measure that patient's T cell responses to an extensive set of candidate neoantigens, tumor-associated antigens or tumor-associated viral antigens for any individual's cancer, allowing us to select those targets associated with the anti-tumor T cell responses that may kill that individual's cancer.

Using ATLAS, we have profiled $CD4^+$ and $CD8^+$ T cell responses to more than 2,500 potential neoantigens to date. The T cell responses we have seen appear to challenge previous assumptions in the field - specifically, that all neoantigens are "good neoantigens," or stimulatory to the immune system. At the meeting of the Society for Immunotherapy of Cancer in November 2018, we presented data from preclinical research in which "inhibitory" neoantigens were observed to promote tumor progression, suggesting that a patient's ratio of stimulatory to inhibitory neoantigens may be predictive of their response to immunotherapies. We are not aware of another platform capable of this comprehensive neoantigen profiling.

The ATLAS portfolio currently includes three patent families, one of which is specifically directed to ATLAS-based methods for cancer diagnosis, prognosis and patient selection, as well as related compositions. This patent family currently comprises a pending PCT application and a pending U.S. application. Patents issuing from these applications are expected to have a patent term until at least March 2038.

Our Immuno-Oncology Programs

Our cancer immunotherapies consist of vaccines that are designed to educate T cells to recognize and attack specific targets, as well as cellular therapies intended to introduce T cells that have been educated to attack these targets, thereby killing

cancer cells. We are developing personalized cancer vaccines using our proprietary ATLAS platform to identify patient-specific neoantigens that are associated with that individual's pre-existing immune responses to a tumor.

Data published in recent years indicate that an individual's response to neoantigens drives the efficacy of immune checkpoint inhibitor, or ICI, therapy and that it is possible to vaccinate an individual against his or her own neoantigens. We believe that neoantigen vaccines could be used in combination with existing treatment approaches for cancer, including ICI therapy, to potentially direct and enhance an individual's T cell response to his or her cancer, thereby potentially effecting better clinical outcomes. Data also support the potential of isolating and expanding T cell populations targeting specific neoantigens for therapeutic benefit.

Our lead immuno-oncology program, GEN-009, is an adjuvanted neoantigen peptide vaccine candidate. Using ATLAS to identify specific neoantigens, we then manufacture a personalized vaccine for each patient using only those neoantigens determined by ATLAS to be stimulatory to that patient's immune system.

The following table describes our active immuno-oncology programs in development:

Program	Description	Stage of Development	Next Milestone(s)	Anticipated Timeline for Next Milestone(s)
GEN-009	First generation neoantigen cancer vaccine	Phase 1/2a	Additional monotherapy results from Part A of clinical trial	Fourth quarter of 2019
			Clinical efficacy data from Part B of clinical trial	Mid-2020
GEN-011	Adoptive T cell therapy	Preclinical	IND filing	First half of 2020
GEN-010	Second generation neoantigen cancer vaccine	Preclinical	Select delivery technology platform	Ongoing

We are currently conducting a Phase 1/2a clinical trial for GEN-009 across a range of solid tumor types:

- Part A of the trial is assessing the safety and immunogenicity of GEN-009 as monotherapy in certain cancer patients with no evidence of disease; and
- Part B of the trial, which we expect to initiate in the second half of 2019, is designed to assess the safety, immunogenicity, and preliminary antitumor activity of GEN-009 in combination with ICI therapy in patients with advanced or metastatic solid tumors.

At the Annual Meeting of the American Society of Clinical Oncology in June 2019, we presented the first peer-reviewed data from Part A of the ongoing clinical trial. In the data from the first five evaluable patients:

- 100% of patients had measurable $CD4^+$ and $CD8^+$ T cell responses to their GEN-009 vaccine;
- Responses were detected for 91% of the administered vaccine neoantigens (N=5), which is significantly higher results than first-generation target prediction methods;
- GEN-009 elicited $CD8^+$ T cell responses *ex vivo,* which is a measure of effector function, for 47% of vaccine neoantigens (N=5);
- GEN-009 elicited broad immune responses using a 10-day *in vitro stimulation* assay, which is a measure of central memory, with 86% of neoantigens eliciting a $CD4^+$ response (N=5) and 33% of neoantigens eliciting a $CD8^+$ response (N=2); and
- GEN-009 was well tolerated, with no dose-limiting toxicities observed.

We currently anticipate reporting the first GEN-009 clinical efficacy data from Part B of the trial in mid-2020.

In addition to GEN-009, we also are advancing preclinical work on GEN-011, an adoptive T cell therapy to neoantigens identified by ATLAS, for which we expect to file an Investigational New Drug Application, or IND, with the U.S. Food and Drug Administration, or FDA, in the first half of 2020, with preliminary clinical efficacy data anticipated in the second half of 2020.

We also continue to explore GEN-010, our vaccine candidate employing next-generation antigen delivery technology, which we may advance to provide an opportunity for better immunogenicity and/or efficiency of production.

In addition, we are using ATLAS to pursue discovery of novel candidate antigens for non-personalized cancer immunotherapies. Such programs could target shared neoantigens, non-mutated, shared tumor-associated antigens, and cancers of viral origin such as cancers driven by Epstein-Barr Virus infection.

Our Strengths

We offer a differentiated and rational approach to neoantigen selection through our proprietary ATLAS platform. ATLAS is a real-time test of T cells from each individual's immune system designed to determine what tumor mutations are recognized by T cells in each patient. Using ATLAS, we believe that we can both optimize neoantigens for inclusion in our immunotherapies and exclude inhibitory antigens that appear to exert an immunosuppressive effect on the patient. We are advancing complementary programs built from insights derived from using our ATLAS platform, including GEN-009, our neoantigen vaccine candidate for which we are conducting a Phase 1/2a clinical trial across a variety of solid tumor types, and GEN-011, our neoantigen-specific adoptive T cell therapy, for which we intend to file an IND in the first half of 2020. Key aspects of our strengths are highlighted below:

- **We are a clinical-stage cancer immunotherapy company focused on the discovery and development of T cell vaccines.** Recent studies from academia and industry have shown that neoantigen-based vaccines can stimulate an efficacious anti-tumor immune response that can prolong melanoma remission. A neoantigen vaccine to amplify responses to therapeutic levels against multiple neoantigens may lead to clinical responses by killing tumor cells and preventing tumor escape via immuno-editing, or the elimination of cancer cells that display only a single neoantigen, while leaving behind cells that do not express that antigen.
- **ATLAS provides us an advantage in identifying and validating vaccine antigens that generate a strong cellular immune response.** The ATLAS platform places us in an advantageous position by allowing identification of neoantigens for which $CD8^+$ and/or $CD4^+$ T cell responses exist in a patient, thereby bypassing the uncertainty of predictive algorithms that cannot determine whether a patient's immune system can actually respond to a particular neoantigen. Immuno-profiling studies have shown that traditional predictive algorithms failed to predict many of the true neoantigens identified by ATLAS, which has been validated in the screening of around 200 cancer patients.
- **Strong management team, advisors, and investors.** We believe that we are a leader in the field of T cell-related immunotherapy discovery and development. Our management and scientific teams possess considerable experience in oncology, immunology, and vaccinology, spanning research, manufacturing, clinical development, and regulatory affairs.

Our Strategy

Our goal is to become a leading cancer immune therapeutics company focused on the discovery and development of personalized cancer immunotherapies using our proprietary ATLAS vaccine discovery platform. We believe that using ATLAS to identify neoantigens could lead to more immunogenic and efficacious cancer vaccines and immunotherapies. Key elements of our strategy are to:

- **Continue to advance our lead neoantigen cancer vaccine candidate, GEN-009.** GEN-009 is a personalized cancer vaccine that uses our proprietary ATLAS platform to ensure the vaccine targets the right neoantigens in each person, for which we have currently evaluating the safety, immunogenicity, and efficacy in a Phase 1/2a clinical trial. We reported the first immunogenicity data available from the trial in June 2019 and expect preliminary clinical efficacy data in mid-2020.
- **Advance GEN-011 into an IND application and explore proprietary vaccine modalities for GEN-010.** Our second product candidate, GEN-011, is a neoantigen adoptive T cell therapy program. We are using ATLAS to identify patient-specific neoantigens that stimulate a patient's immune system. Isolating the T cells that are activated by those neoantigens allows us to expand the patient's own autologous T cells to create a cell-based therapeutic. We are currently conducting preclinical studies of GEN-011 with an aim of filing an IND to begin clinical study in the United States in the first half of 2020. Additionally, we expect to advance GEN-010, our novel neoantigen cancer vaccine program.
- **Utilize ATLAS, our antigen discovery platform, to support development of additional cancer immunotherapies.** We are currently exploring a variety of partnership opportunities both to accelerate development of GEN-009, GEN-011, GEN-010, and our shared antigen vaccine programs, as well as to expand the applications for our ATLAS technology. For example, in May 2019, we entered into a research collaboration with Iovance Biotherapeutics, Inc. to assess the potential utility of ATLAS in the development of next-generation tumor-infiltrating lymphocyte therapies. Through these

collaborations, we intend to allow access to our ATLAS platform and intellectual property, in exchange for potential upfront payments, development and commercial milestones, and royalties, to third parties developing cancer immunotherapies in areas that are not competitive with our product candidates.

Participation in This Offering By Existing Stockholders

In February 2019, we entered into a subscription agreement with certain investors pursuant to which we offered, in an unregistered offering, shares of our common stock and warrants to purchase shares of our common stock in two closings. The first closing occurred in February 2019, in which we sold shares and warrants for net proceeds of approximately $14.0 million. The occurrence of the second closing, at which we could sell additional shares and warrants for gross proceeds of up to $24.2 million, was at our option, and was contingent upon the receipt of top-line results from Part A of our Phase 1/2a clinical trial for GEN-009. In June 2019, we announced top-line results from this trial and elected not to proceed with a potential second closing under the subscription agreement. However, the investors have indicated an interest in purchasing an aggregate of up to approximately $24.2 million in shares of our common stock in this offering at the public offering price per share and on the same terms as the other purchasers in this offering. Because indications of interest are not binding agreements or commitments to purchase, the underwriters could determine to sell more, less or no shares to any of these existing stockholders and any of these existing stockholders could determine to purchase more, less or no shares in this offering.

Risks Associated with Our Business

Our business is subject to numerous risks and uncertainties, including those highlighted in the section entitled "Risk Factors" immediately following this prospectus summary. These risks include, among others, the following:

- We have incurred significant losses since our founding in 2006 and anticipate that we will continue to incur significant losses for the foreseeable future and may never achieve or maintain profitability.
- We will require substantial additional financing to achieve our goals, and a failure to obtain this necessary capital when needed would force us to delay, limit, reduce or terminate our product development or commercialization efforts.
- We cannot be certain that we will be successful in advancing GEN-009, our lead product candidate, through clinical development, obtaining regulatory approval for it, or commercializing it or any of our future product candidates.
- Because our active product candidate is in an early stage of clinical development, there is a high risk of failure, and we may never succeed in developing marketable products or generating product revenue.
- We may find it difficult to enroll patients in our clinical trials, which could delay or prevent clinical trials of our product candidates.
- Our active development product, GEN-009, includes a novel vaccine adjuvant and our other current and potential future product candidates may include one or more novel adjuvants, which may make it difficult for us to predict the time and cost of product development as well as the requirements the FDA or other regulatory agencies may impose to demonstrate the safety of such product candidates.
- We rely on third parties to conduct non-clinical studies and clinical trials for our product candidates, including our active clinical development product, GEN-009, and any other current or future product candidates, and if they do not properly and successfully perform their obligations to us, we may not be able to obtain regulatory approvals for our product candidates.
- If we are unable to obtain or protect intellectual property rights related to our product candidates, we may not be able to compete effectively in our markets.
- Our level of indebtedness and debt service obligations could adversely affect our financial condition and may make it more difficult for us to fund our operations.
- Our largest stockholder, New Enterprise Associates, could exert significant influence over us and could limit your ability to influence the outcome of key transactions, including any change of control.

Implications of Being an Emerging Growth Company

We are an "emerging growth company" as defined in the Jumpstart Our Business Startups Act of 2012. We will remain an emerging growth company until December 31, 2019. We refer to the Jumpstart Our Business Startups Act of 2012 in this prospectus as the "JOBS Act," and references in this prospectus to "emerging growth company" shall have the meaning ascribed to it in the JOBS Act.

As an emerging growth company, we may take advantage of specified reduced disclosure and other requirements that are otherwise applicable, in general, to public companies that are not emerging growth companies. These provisions include:

- reduced disclosure about our executive compensation arrangements;
- exemption from the non-binding shareholder advisory votes on executive compensation or golden parachute arrangements;
- exemption from the auditor attestation requirement in the assessment of our internal control over financial reporting; and
- reduced disclosure of financial information in this prospectus and the documents incorporated by reference into this prospectus, such as being permitted to include only two years of audited financial information and two years of selected financial information in addition to any required unaudited interim financial statements, with correspondingly reduced "Management's Discussion and Analysis of Financial Condition and Results of Operations" disclosure.

We may choose to take advantage of some, but not all, of the available exemptions. We have taken advantage of some reduced reporting burdens in this prospectus and the documents incorporated by reference into this prospectus. Accordingly, the information contained herein may be different than the information you receive from other public companies in which you hold stock. The JOBS Act permits an emerging growth company to take advantage of an extended transition period to comply with new or revised accounting standards applicable to public companies. We have irrevocably elected not to avail ourselves of this extended transition period and, as a result, we will adopt new or revised accounting standards on the relevant dates on which adoption of such standards is required for non-emerging growth companies.

Corporate Information

We were incorporated in the state of Delaware in August 2006 as Genocea, Inc., and we subsequently changed our name to Genocea Biosciences, Inc. Our principal executive offices are located at 100 Acorn Park Drive, Cambridge, MA 02140, and our telephone number is (617) 876-8191. Our website address is: www.genocea.com. We have included our website address as a factual reference and do not intend it to be an active link to our website. The information that can be accessed through our website is not part of this prospectus, and investors should not rely on any such information in deciding whether to purchase our common stock.

Genocea® and the Genocea logo are our registered trademarks. The other trademarks, trade names and service marks appearing in this prospectus are the property of their respective owners.

THE OFFERING

Common stock we are offering	10,000,000 shares
Common stock outstanding after this offering	24,049,181 shares (or 25,549,181 shares if the underwriters exercise their option to purchase additional shares in full)
Option to purchase additional shares	The underwriters have a 30-day option to purchase a total of 1,500,000 additional shares of common stock.
Use of proceeds	The net proceeds from this offering will be approximately $48.7 million, or approximately $56.3 million if the underwriters exercise their option to purchase 1,500,000 additional shares in full, at the assumed public offering price of $5.38 per share (the last reported price of our common stock on the Nasdaq Capital Market on June 17, 2019), after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us. We intend to use the net proceeds from this offering, together with our existing cash and cash equivalents, to conduct additional clinical trials evaluating the efficacy of GEN-009; to file an IND and commence clinical development to determine the clinical efficacy of GEN-011; to further preclinical development of GEN-010; and to further invest in ATLAS and related research programs. See "Use of Proceeds."
Risk factors	See "Risk Factors" beginning on page 7 and the other information included and incorporated by reference in this prospectus for a discussion of factors you should carefully consider before deciding to invest in our common stock.
Nasdaq Capital Market Symbol	"GNCA"

In this prospectus, unless otherwise indicated, the amount of shares of common stock outstanding and the other information based thereon is based on 14,049,181 shares of common stock outstanding as of March 31, 2019 and does not reflect:

- 1,303,407 shares of common stock issuable upon exercise of stock options outstanding at March 31, 2019 at a weighted-average exercise price of $12.88;
- 5,131,398 shares of common stock issuable upon exercise of warrants outstanding at March 31, 2019 at a weighted-average exercise price of $7.77;
- 204,375 shares of common stock issuable upon conversion of preferred stock outstanding at March 31, 2019;
- 271,743 shares of common stock reserved for future issuance under our 2014 Amended and Restated Equity Incentive Plan as of March 31, 2019; and
- 289,085 shares of common stock reserved for future issuance under our 2014 Employee Stock Purchase Plan as of March 31, 2019.

Unless otherwise indicated, all information in this prospectus reflects or assumes the following:

- a one-for-eight reverse stock split of our common stock that we effected on May 22, 2019;
- no exercise of stock options or warrants or conversion of preferred stock after March 31, 2019; and
- no exercise by the underwriters of their option to purchase up to 1,500,000 additional shares of common stock in this offering.

RISK FACTORS

Investing in our common stock involves a high degree of risk. Before investing in our common stock, you should consider carefully the risks described below, together with the other information contained in this prospectus and incorporated by reference in this prospectus, including the risk factors incorporated by reference from our Annual Report on Form 10-K for the year ended December 31, 2018 and other filings we make with the SEC. We believe the risks described below and incorporated by reference herein are the risks that are material to us as of the date of this prospectus. The risks and uncertainties described below are not the only ones we face. Additional risks and uncertainties not presently known to us or that we currently believe to be immaterial may also adversely affect our business.

Additional Risks Related to This Offering

We may allocate the net proceeds from this offering in ways that you and other stockholders may not approve.

We intend to use the net proceeds from this offering, together with our existing cash and cash equivalents, to conduct additional clinical trials evaluating the efficacy of GEN-009; to file an IND and commence clinical development to determine the clinical efficacy of GEN-011; to further preclinical development of GEN-010; and to further invest in ATLAS and related research programs. This expected use of the net proceeds from this offering represents our intentions based upon our current plans and business conditions. The amounts and timing of our actual expenditures may vary significantly depending on numerous factors, including the progress of our development efforts, the status of and results from clinical trials, as well as any collaborations that we may enter into with third parties for our product candidates, and any unforeseen cash needs. Because of the number and variability of factors that will determine our use of the proceeds from this offering, their ultimate use may vary substantially from their currently intended use. As a result, our management will retain broad discretion over the allocation of the net proceeds from this offering and could spend the proceeds in ways that do not necessarily improve our operating results or enhance the value of our common stock. See “Use of Proceeds."

If you purchase our common stock in this offering, you will incur immediate and substantial dilution in the book value of your shares.

The public offering price of our common stock is substantially higher than the net tangible book value per share of our common stock. Therefore, if you purchase shares of our common stock in this offering, you will pay a price per share that substantially exceeds our net tangible book value per share after this offering. After giving effect to the sale of 10,000,000 shares of our common stock in this offering based on an assumed public offering price of $5.38 per share (the last reported sale price of our common stock on The Nasdaq Capital Market on June 17, 2019), less the estimated underwriting discounts and commissions, and estimated offering expenses payable by us and based on a net tangible book value per share of our common stock of $0.35 as of March 31, 2019, if you purchase shares in this offering, you will suffer immediate and substantial dilution of $3.15 per share in the net tangible book value of common stock purchased. To the extent shares are issued under outstanding options, warrants or preferred stock or we sell additional equity or convertible debt securities in the future, you will incur further dilution. See "Dilution" for a more detailed description of the dilution to new investors in the offering.

Investors in this offering may experience future dilution.

In order to raise additional capital, we may in the future offer additional shares of our common stock or other securities convertible into, or exchangeable for, our common stock at prices that may not be the same as the price per share in this offering. We cannot assure you that we will be able to sell shares of our common stock or other related securities in any other offering at a price per share that is equal to or greater than the price per share paid by investors in this offering. If the price per share at which we sell additional shares of our common stock or related securities in future transactions is less than the price per share in this offering, investors who purchase our common stock in this offering will suffer a dilution in their investment.

A significant portion of our total outstanding shares may be sold into the market at any time, which could cause the market price of our common stock to drop significantly, even if our business is doing well.

Sales of a substantial number of shares of our common stock in the public market could occur at any time. These sales, or the perception in the market that the holders of a large number of shares intend to sell shares, could reduce the market price of our common stock.

Upon the completion of this offering, approximately 4.8 million shares of our common stock beneficially owned by our officers and directors will be subject to lock-up agreements with the underwriters that prohibit, subject to certain exceptions, the disposal or pledge of, or the hedging against, any of their common stock or securities convertible into or exchangeable for shares

of common stock for a period of 90 days after the date of this prospectus. However, all of the shares sold in this offering and the remaining shares of our common stock outstanding prior to this offering will not be subject to lock-up agreements with the underwriters and, except to the extent such shares are held by our affiliates, will be freely tradable. The market price of our common stock could decline as a result of sales by our stockholders in the market following completion of this offering or the perception that these sales could occur. These factors could also make it difficult for us to raise additional capital by selling stock.

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus and the documents incorporated by reference into this prospectus contain forward-looking statements. Forward-looking statements are neither historical facts nor assurances of future performance. Instead, they are based on our current beliefs, expectations and assumptions regarding the future of our business, future plans and strategies, our clinical results and other future conditions. The words "anticipate", "believe", "contemplate", "continue", "could", "estimate", "expect", "forecast", "goal", "intend", "may", "plan", "potential", "predict", "project", "should", "target", "will", "would", or the negative of these terms or other similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words. In particular, you should consider the numerous risks described in this prospectus and in our Annual Report on Form 10-K for the year ended December 31, 2018 incorporated by reference in this prospectus.

The forward-looking statements in this prospectus include, among other things, statements about:

- our estimates regarding the timing and amount of funds we require to conduct clinical trials for GEN-009, to file our IND for our other product candidates and to continue our investments in immuno-oncology;
- our estimates regarding expenses, future revenues, capital requirements, the sufficiency of our current and expected cash resources and our need for additional financing;
- the timing of, and our ability to, obtain and maintain regulatory approvals for our product candidates;
- the potential benefits of strategic partnership agreements and our ability to enter into strategic partnership arrangements;
- our intellectual property position;
- the rate and degree of market acceptance and clinical utility of any approved product candidate;
- our ability to quickly and efficiently identify and develop product candidates; and
- our commercialization, marketing and manufacturing capabilities and strategy.

We may not actually achieve the plans, intentions or expectations disclosed in our forward-looking statements, and you should not place undue reliance on our forward-looking statements. Actual results or events could differ materially from the plans, intentions and expectations disclosed in the forward-looking statements we make. Our forward-looking statements do not reflect the potential impact of any future acquisitions, mergers, dispositions, joint ventures or investments we may make or collaborations or strategic partnerships we may enter into.

You should read this prospectus, other documents incorporated by reference herein and the documents that we have filed as exhibits to the registration statement of which this prospectus is a part completely and with the understanding that our actual future results may be materially different from what we expect. The forward-looking statements represent our views as of the date of this prospectus. We anticipate that subsequent events and developments will cause our views to change. However, while we may elect to update these forward-looking statements at some point in the future, we have no current intention of doing so except to the extent required by applicable law. You should, therefore, not rely on these forward-looking statements as representing our views as of any date subsequent to the date of this prospectus.

This prospectus and the other documents incorporated by reference herein include statistical and other industry and market data that we obtained from industry publications and research, surveys and studies conducted by third parties. Industry publications and third party research, surveys and studies generally indicate that their information has been obtained from sources believed to be reliable, although they do not guarantee the accuracy or completeness of such information. While we believe these industry publications and third party research, surveys and studies are reliable, we have not independently verified such data.

USE OF PROCEEDS

The net proceeds of the sale of shares of common stock in this offering will be approximately $48.7 million assuming a public offering price of $5.38 per share (the last reported price of our common stock on The Nasdaq Capital Market on June 17, 2019) after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us. If the underwriters exercise their option to purchase additional share of common stock in full, we estimate that the net proceeds will be approximately $56.3 million, after deducting underwriting discounts and commissions and estimated offering expenses payable by us. Each $1.00 increase or decrease in the assumed public offering price of $5.38 per share (the last reported price of our common stock on The Nasdaq Capital Market on June 17, 2019) would increase or decrease our net proceeds by approximately $9.4 million, assuming the number of shares offered by us, as set forth on the cover of this prospectus, remains the same. We may also increase or decrease the number of shares we are offering. An increase or decrease of 1,000,000 shares in the number of common stock we are offering would increase or decrease the net proceeds from this offering by $5.1 million, assuming no change in the assumed public offering price.

As of March 31, 2019, we had cash and cash equivalents of $29.0 million. We intend to use the net proceeds from this offering, together with our existing cash and cash equivalents, to conduct additional clinical trials evaluating the efficacy of GEN-009; to file an IND and commence clinical development to determine the clinical efficacy of GEN-011; to further preclinical development of GEN-010; and to further invest in ATLAS and related research programs. The remainder will be used for other general corporate purposes.

Our expected use of net proceeds from this offering represents our current intentions based upon our present plans and business condition, which could change in the future as our plans and business conditions evolve. As of the date of this prospectus, we cannot predict with certainty all of the particular uses for the net proceeds to be received upon the completion of this offering or the amounts that we will actually spend on the uses set forth above. We may also use a portion of the net proceeds to in-license, acquire or invest in complementary technologies, products or assets, although we have no current agreements, arrangements or commitments with respect to any potential acquisition, investment or license as of the date of this prospectus. We believe that our cash, cash equivalents and investments, together with the net proceeds from this offering, will fund our operations into the first quarter of 2021. However, we have based this estimate on assumptions that may prove to be wrong, and we could use our available capital resources sooner than we currently expect.

The amount and timing of our actual expenditures will depend upon numerous factors, including the results of our research and development efforts, the timing and success of non-clinical studies, our ongoing clinical trials or clinical trials we may commence in the future and the timing of regulatory submissions. As a result, our management will have broad discretion over the use of the net proceeds from this offering.

Pending the use of the proceeds from this offering, we intend to invest the net proceeds in short-term, interest-bearing, investment-grade securities, certificates of deposit or government securities.

MARKET PRICE OF OUR COMMON STOCK

Our common stock is listed on The Nasdaq Capital Market under the symbol "GNCA." On June 17, 2019, the closing price for our common stock as reported on The Nasdaq Capital Market was $5.38 per share. As of June 17, 2019, we had 19 holders of record of our common stock.

DIVIDEND POLICY

We have never declared or paid cash dividends on our common stock. We currently intend to retain all available funds and any future earnings, if any, to fund the development and expansion of our business and we do not anticipate paying any cash dividends in the foreseeable future. Any future determination to pay dividends will be made at the discretion of our board of directors. Additionally, our ability to pay dividends on our common stock is limited by restrictions under the terms of the agreements governing our secured credit facility with Hercules Capital, Inc. Payment of future cash dividends, if any, will be at the discretion of the board of directors after taking into account various factors, including our financial condition, operating results, current and anticipated cash needs, the requirements of current or then-existing debt instruments and other factors the board of directors deems relevant.

CAPITALIZATION

Effective May 22, 2019, we effected a reverse stock split of our issued and outstanding common stock, par value $0.001 per share, at a ratio of one-for-eight, and decreased the number of authorized shares of common stock from 250,000,000 shares to 85,000,000 shares. The share numbers below reflect the reverse stock split.

The following table sets forth our cash and cash equivalents and capitalization as of March 31, 2019:

- on an actual basis; and
- on an as adjusted basis to give further effect to the sale of shares of our common stock offered in this offering at an assumed public offering price of $5.38 per share (the last reported price of our common stock on The Nasdaq Capital Market on June 17, 2019), after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us.

	As of March 31, 2019	
(in thousands, except per share data)	**Actual**	**As Adjusted**
	(unaudited)	
Cash and cash equivalents	$ 29,038	$ 77,785
Long-term debt, including current portion and discount	14,122	14,122
Stockholders equity:		
Preferred stock, $0.001 par value; 25,000,000 shares authorized, 1,635 shares issued and outstanding, actual and as adjusted	701	701
Common stock, $0.001 par value; 85,000,000 shares authorized, 14,049,181 shares issued and outstanding, actual; 24,049,181 shares issued and outstanding, as adjusted	112	122
Additional paid-in capital	312,993	361,730
Accumulated deficit	(307,571)	(307,571)
Total stockholders' equity	6,235	54,982
Total capitalization	$ 20,357	$ 69,104

You should read this information together with our unaudited financial statements and related notes and the “Management's Discussion and Analysis of Financial Condition and Results of Operations” in our Quarterly Report on Form 10-Q for the quarter ended March 31, 2019, which are incorporated by reference into this prospectus.

A $1.00 increase (decrease) in the assumed public offering price of $5.38 per share, which was the last reported sale price of our common stock on the Nasdaq Capital Market on June 17, 2019, would increase (decrease) the as adjusted amount of each of cash and cash equivalents, total stockholders’ equity and total capitalization by $9.4 million, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting estimated underwriting discounts and commissions. An increase (decrease) of 1,000,000 shares in the number of shares offered by us, as set forth on the cover page of this prospectus, would increase (decrease) the as adjusted amount of each of cash and cash equivalents, total stockholders’ equity and total capitalization by $5.1 million, assuming no change in the assumed public offering price per share and after deducting estimated underwriting discounts and commissions.

The table above does not include:

- 1,303,407 shares of common stock issuable upon exercise of stock options outstanding at March 31, 2019 at a weighted-average exercise price of $12.88;
- 5,131,398 shares of common stock issuable upon exercise of warrants outstanding at March 31, 2019 at a weighted-average exercise price of $7.77;
- 204,375 shares of common stock issuable upon conversion of preferred stock outstanding at March 31, 2019;
- 271,743 shares of common stock reserved for future issuance under our 2014 Amended and Restated Equity Incentive Plan as of March 31, 2019; and
- 289,085 shares of common stock reserved for future issuance under our 2014 Employee Stock Purchase Plan as of March 31, 2019.

DILUTION

If you invest in our common stock in this offering, your ownership interest will be diluted immediately to the extent of the difference between the public offering price per share of our common stock and the as adjusted net tangible book value per share of our common stock after this offering.

Our historical net tangible book value as of March 31, 2019 was $5.0 million, or $0.35 per share of our common stock. Historical net tangible book value per share represents the amount of our total tangible assets less total liabilities, divided by 14,049,181 shares of our common stock outstanding, after giving effect to our reverse stock split effected on May 22, 2019.

After giving effect to the sale of 10,000,000 shares of common stock by us, at an assumed public offering price of $5.38 per share (the last reported sale price of our common stock on The Nasdaq Capital Market on June 17, 2019), less the estimated underwriting discounts and commissions and estimated offering expenses payable by us, our as adjusted net tangible book value will be approximately $53.7 million, or approximately $2.23 per share, after this offering. This represents an immediate increase in net tangible book value per share of $1.88 to existing stockholders and immediate dilution of $3.15 in net tangible book value per share to new investors purchasing common stock in this offering.

Dilution per share to new investors is determined by subtracting as adjusted net tangible book value per share after this offering from the assumed public offering price per share paid by new investors. The following table illustrates this dilution on a per share basis.

Assumed public offering price per share			$	5.38
Net tangible book value per share as of March 31, 2019	$	0.35		
Increase in net tangible book value per share attributable to new investors	$	1.88		
As adjusted net tangible book value per share after this offering			$	2.23
Dilution per share to new investors			$	3.15

The dilution information discussed above is for illustrative purposes only and will change based on the actual public offering price. Each $1.00 increase (decrease) in the assumed public offering price of $5.38 per share would increase (decrease) our as adjusted net tangible book value by approximately $9.4 million, the as adjusted net tangible book value per share by approximately $0.39 per share and the dilution to investors purchasing shares in this offering by approximately $0.61 per share, assuming the number of shares offered by us, as set forth on the cover of this prospectus, remains the same and after deducting the underwriting discounts and commissions and estimated offering expenses payable by us. An increase of 1,000,000 shares in the number of shares offered by us, as set forth on the cover page of this prospectus, would increase the as adjusted net tangible book value after this offering by $0.12 per share and decrease the dilution to new investors purchasing common stock in this offering by $0.12 per share, assuming no change in the assumed public offering price per share and after deducting estimated underwriting discounts and commissions. A decrease of 1,000,000 shares in the number of shares offered by us, as set forth on the cover page of this prospectus, would decrease the as adjusted net tangible book value after this offering by $0.12 per share and increase the dilution to new investors purchasing common stock in this offering by $0.12 per share, assuming no change in the assumed public offering price per share and after deducting estimated underwriting discounts and commissions.

If the underwriters exercise their option to purchase additional shares or if any additional shares are issued under outstanding options, warrants or preferred stock, you will experience further dilution.

The number of shares of our common stock to be outstanding upon completion of this offering as reflected in the foregoing dilution calculations excludes:

- 1,303,407 shares of common stock issuable upon exercise of stock options outstanding at March 31, 2019 at a weighted-average exercise price of $12.88;
- 5,131,398 shares of common stock issuable upon exercise of warrants outstanding at March 31, 2019 at a weighted-average exercise price of $7.77;
- 204,375 shares of common stock issuable upon conversion of preferred stock outstanding at March 31, 2019;
- 271,743 shares of common stock reserved for future issuance under our 2014 Amended and Restated Equity Incentive Plan as of March 31, 2019; and
- 289,085 shares of common stock reserved for future issuance under our 2014 Employee Stock Purchase Plan as of March 31, 2019.

PRINCIPAL STOCKHOLDERS

The following table sets forth information relating to the beneficial ownership of our common stock as of May 31, 2019 by: each person, or group of affiliated persons, known by us to beneficially own more than 5% of our outstanding shares of common stock; each of our directors; each of our named executive officers; and all directors and executive officers as a group.

The number of shares beneficially owned by each entity, person, director or executive officer is determined in accordance with the rules of the SEC, and the information is not necessarily indicative of beneficial ownership for any other purpose. Under such rules, beneficial ownership includes any shares over which the individual has sole or shared voting power or investment power as well as any shares that the individual has the right to acquire within 60 days of May 31, 2019 through the exercise of any stock options, warrants or other rights. Except as otherwise indicated, and subject to applicable community property laws, the persons named in the table have sole voting and investment power with respect to all shares of common stock held by that person.

The percentage of shares beneficially owned is computed on the basis of 14,050,250 shares of our common stock outstanding as of May 31, 2019. Shares of our common stock that a person has the right to acquire within 60 days of May 31, 2019 are deemed outstanding for purposes of computing the percentage ownership of the person holding such rights, but are not deemed outstanding for purposes of computing the percentage ownership of any other person, except with respect to the percentage ownership of all directors and executive officers as a group. Unless otherwise indicated below, the address for each beneficial owner listed is c/o Genocea Biosciences, Inc., Cambridge Discovery Park, 100 Acorn Park Drive, Cambridge, MA 02140.

Certain holders of more than 5% of our common stock and their affiliated entities have indicated an interest in purchasing an aggregate of up to approximately $24.2 million in shares of our common stock in this offering at the public offering price. Assuming a public offering price of $5.38 per share (the last reported price of our common stock on the Nasdaq Capital Market on June 17, 2019), these entities would purchase an aggregate of up to approximately 4,500,000 of the 10,000,000 shares in this offering based on these indications of interest. However, because indications of interest are not binding agreements or commitments to purchase, the underwriters could determine to sell more, less or no shares to any of these existing stockholders and any of these existing stockholders could determine to purchase more, less or no shares in this offering. The following table does not reflect any such potential purchases by these existing principal stockholders or their affiliated entities. However, if any shares are purchased by these stockholders, the number of shares of common stock beneficially owned after this offering and the percentage of common stock beneficially owned after this offering will differ from that set forth in the table below.

Name and Address of Beneficial Owned	Number of Shares Beneficially Owned	Percentage of Shares Beneficially Owned Before Offering	Percentage of Shares Beneficially Owned After Offering
5% or greater stockholders:			
New Enterprise Associates 16, L.P. (1) 1954 Greenspring Drive, Suite 600 Timonium, MD 21093	6,241,918	39.20%	24.08%
S.R. One, Limited (2) 980 Great West Road Brentford, Middlesex, TW8 9GS England	1,819,627	12.67%	7.47%
BVF Partners L.P. (3) 44 Montgomery Street, 40th Floor San Francisco, CA 94104	1,450,799	9.99%	8.12%
Vivo Opportunity , LLC (4) 505 Hamilton Avenue, Suite 2017 Palo Alto, CA 94301	1,423,236	9.99%	7.40%
Directors and Named Executive Officers:			
William Clark (5)	203,456	1.43%	*
Jessica Baker Flechtner, Ph.D. (6)	54,561	*	*
Pamela Carroll, Ph.D. (7)	15,849	*	*
Kenneth Bate (8)	11,267	*	*
Ali Behbahani, M.D. (9)	3,125	*	*
Katrine Bosley (10)	18,514	*	*
Ronald Cooper (11)	10,625	*	*
Michael Higgins (12)	10,636	*	*
Howard Mayer, M.D. (13)	7,709	*	*
George Siber, M.D. (14)	38,662	*	*
All executive officers and directors as a group (15 persons) (15)	402,708	2.80%	1.65%

(1) Based on a Schedule 13D filed with the SEC on February 14, 2019, consisting of 4,368,534 shares of common stock and warrants to purchase 1,873,384 shares of common stock. NEA Partners 16, L.P. ("NEA Partners 16") is the sole general partner of NEA 16. NEA 16 GP, LLC ("NEA 16 LLC") is the sole general partner of NEA Partners 16. The individual managers of NEA 16 LLC are Peter J. Barris, Forest Baskett, Ali Behbahani, Carmen Chang, Anthony A. Florence, Jr., Mohamad H. Makhzoumi, Joshua Makower, David M. Mott, Scott D. Sandell, Peter W. Sonsini and Paul Walker (collectively, the "Managers"). The Managers share voting and dispositive power with regard to the shares held directly by NEA 16.

(2) Based on a Schedule 13D filed with the SEC on February 25, 2019, consisting of 1,508,743 shares of common stock and 310,884 shares of common stock issuable upon the exercise of warrants. These shares and warrants are held directly by S.R. One, Limited, an indirect wholly-owned subsidiary of GlaxoSmithKline plc.

(3) Based on a Schedule 13G filed with the SEC on February 14, 2019, which discloses shares as of December 31, 2018, and securities purchased in connection with a private placement in February 2019. Consists of 472,236 shares of common stock held of record by Biotechnology Value Fund, L.P. ("BVF"), 365,519 shares of common stock held of record by Biotechnology Value Fund II, L.P. ("BVF2"), 73,929 shares of common stock held of record by Biotechnology Value Trading Fund OS LP ("Trading Fund OS"), and 66,848 shares of common stock held of record by the Partners Managed Accounts ("Managed Accounts"). Also includes 472,267 shares of common stock issuable upon exercise of warrants held by the above referenced BVF entities. Excludes 589,102 shares of common stock issuable upon the exercise of

warrants, which are not exercisable within 60 days of May 31, 2019 by virtue of the beneficial ownership limitation described below. The number of shares of common stock into which the warrants are convertible is limited to that number of shares of common stock which would result in the stockholders, together with its affiliates, having an aggregate beneficial ownership of no more than 9.99% of the total issued and outstanding shares of common stock. This beneficial ownership limitation may be increased or decreased to an amount not to exceed 19.99% of the number of shares of common stock outstanding immediately after giving effect to the issuance of shares of common stock issuable upon exercise of warrants.

(4) Based on a Schedule 13G filed with the SEC on January 26, 2018, consisting of 1,022,500 shares of common stock, 204,375 shares of common stock upon conversion of 1,635 shares of Series A convertible preferred stock held of record by Vivo Opportunity Fund, L.P., and 196,361 shares of common stock issuable upon exercise of 392,722 warrants. Excludes 417,077 shares of common stock issuable upon the exercise of warrants, which are not exercisable within 60 days of May 31, 2019 by virtue of the beneficial ownership limitation described below. Vivo Opportunity, LLC is the general partner of Vivo Opportunity Fund, L.P. The voting members of Vivo Opportunity, LLC are Frank Kung, Albert Cha, Shan Fu, Gaurav Aggarwal and Michael Chang, none of whom has individual voting or investment power with respect to these shares of common stock and each of whom disclaims beneficial ownership of such shares of common stock. The number of shares of common stock into which the Series A convertible preferred stock are convertible is limited to that number of shares of common stock which would result in the stockholder, together with its affiliates, having an aggregate beneficial ownership of no more than 9.99% of the total issued and outstanding shares of common stock. The number of shares of common stock issuable upon exercise of warrants is limited to that number of shares of common stock which would result in the stockholder, together with its affiliates, having an aggregate beneficial ownership of no more than 4.99% to the total issued and outstanding shares of common stock. This beneficial ownership limitation may be increased or decreased to an amount not to exceed 9.99% of the number of shares of common stock outstanding immediately after giving effect to the issuance of shares of common stock issuable upon exercise of the warrants.

(5) Consisting of 14,992 shares of common stock and 188,464 shares of common stock that can be acquired upon the exercise of options within 60 days of May 31, 2019.

(6) Consisting of 2,099 shares of common stock and 52,462 shares of common stock that can be acquired upon the exercise of options within 60 days of May 31, 2019.

(7) Consisting of 1,450 shares of common stock and 14,399 shares of common stock that can be acquired upon the exercise of options within 60 days of May 31, 2019.

(8) Consisting of 11,267 shares of common stock that can be acquired upon the exercise of options within 60 days of May 31, 2019.

(9) Consisting of 3,125 shares of common stock that can be acquired upon the exercise of options within 60 days of May 31, 2019.

(10) Consisting of 3,887 shares of common stock and 14,627 shares of common stock that can be acquired upon the exercise of options within 60 days of May 31, 2019.

(11) Consisting of 10,625 shares of common stock that can be acquired upon the exercise of options within 60 days of May 31, 2019.

(12) Consisting of 10,636 shares of common stock that can be acquired upon the exercise of options within 60 days of May 31, 2019.

(13) Consisting of 7,709 shares of common stock that can be acquired upon the exercise of options within 60 days of May 31, 2019.

(14) Consisting of 20,678 shares of common stock and 17,984 shares of common stock that can be acquired upon the exercise of options within 60 days of May 31, 2019.

(15) Consisting of 50,841 shares of common stock and 351,867 shares of common stock that can be acquired upon the exercise of options within 60 days of May 31, 2019.

DESCRIPTION OF CAPITAL STOCK

General

The following description of our capital stock is intended as a summary only and is qualified in its entirety by reference to our fifth amended and restated certificate of incorporation, as amended, our amended and restated by-laws and the applicable provisions of the Delaware General Corporation Law. We refer in this section to our fifth amended and restated certificate of incorporation, as amended, as our certificate of incorporation, and we refer to our amended and restated by-laws as our by-laws. As of the date of this prospectus, our authorized capital stock consists of 85,000,000 shares of our common stock, par value $0.001 per share and 25,000,000 shares of our preferred stock, par value $0.001 per share.

As of March 31, 2019, after giving effect to the reverse stock split effected on May 22, 2019, we had issued and outstanding:

- 14,049,181 shares of our common stock;
- 1,635 shares of our preferred stock;
- options to purchase a total of 1,303,407 shares of our common stock with a weighted average exercise price of $12.88 per share; and
- 5,131,398 shares of common stock issuable upon the exercise of warrants outstanding at a weighted-average exercise price of $7.77 per share.

As of March 31, 2019, we had 23 holders of record of our common stock and one holder of record of our preferred stock.

Common Stock

Dividend Rights. Subject to preferences that may apply to shares of preferred stock outstanding at the time, holders of outstanding shares of common stock are entitled to receive dividends out of assets legally available at the times and in the amounts as the board of directors may from time to time determine.

Conversion or Redemption Rights. Our common stock is neither convertible nor redeemable.

Liquidation Rights. Upon our liquidation, dissolution or winding up, the holders of our common stock are entitled to receive pro rata our assets which are legally available for distribution, after payment of all debts and other liabilities and the satisfaction of any liquidation preference granted to the holders of any then-outstanding shares of preferred stock.

Rights and Preferences. Holders of common stock have no preemptive, conversion or subscription rights and there are no redemption or sinking fund provisions applicable to the common stock. The rights, preferences and privileges of the holders of common stock are subject to, and may be adversely affected by, the rights of the holders of shares of any series of preferred stock that we may designate in the future.

Preferred Stock

Our board of directors have the authority, without further action by our stockholders, to issue up to 25,000,000 shares of preferred stock in one or more series, to establish from time to time the number of shares to be included in each such series, to fix the rights, preferences and privileges of the shares of each wholly unissued series and any qualifications, limitations or restrictions thereon, and to increase or decrease the number of shares of any such series, but not below the number of shares of such series then outstanding.

Our board of directors may authorize the issuance of preferred stock with voting or conversion rights that could adversely affect the voting power or other rights of the holders of our common stock. The purpose of authorizing our board of directors to issue preferred stock and determine its rights and preferences is to eliminate delays associated with a stockholder vote on specific issuances. The issuance of preferred stock, while providing flexibility in connection with possible acquisitions and other corporate purposes, could, among other things, have the effect of delaying, deferring or preventing a change in control of us and may adversely affect the market price of our common stock and the voting and other rights of the holders of our common stock. It is not possible to state the actual effect of the issuance of any shares of preferred stock on the rights of holders of common stock until the board of directors determines the specific rights attached to that preferred stock.

Our board of directors has designated 1,635 of the 25,000,000 authorized shares of preferred stock as Series A preferred stock. The Series A preferred stock ranks pari passu on an as-converted to common stock basis with all of our common stock as to distributions of assets upon our liquidation, dissolution or winding up, whether voluntarily or involuntarily, or a "Fundamental Transaction," as defined in the Series A preferred stock certificate of designation (the "Certificate of Designation"). Each share of our Series A preferred stock is convertible into 204,375 shares of our common stock (subject to adjustment as provided in the Certificate of Designation) at any time at the option of the holders at a conversion price of $8.00 per share, provided that the holders will be prohibited from converting Series A preferred stock into shares of our common stock if, as a result of such conversion, a holder, together with its affiliates, would own more than 9.99% of the total number of shares of our common stock then issued and outstanding.

Shares of Series A preferred stock generally have no voting rights, except as required by law and except that the consent of holders of a majority of the outstanding Series A preferred stock will be required to amend the terms of the Series A preferred stock. Shares of Series A preferred stock are entitled to receive dividends equal, on an as-converted to common stock basis, to and in the same form as dividends actually paid on shares of common stock when, as and if such dividends are paid on shares of common stock. We are not obligated to redeem or repurchase any shares of Series A preferred stock. Shares of Series A preferred stock are not otherwise entitled to any redemption rights, or mandatory sinking fund or analogous fund provisions.

Warrants

As of March 31, 2019, we had the following warrants outstanding:

- warrants exercisable for an aggregate of 9,216 shares of our common stock at an exercise price of $65.92 per share that expire on November 20, 2019 and may be exercised at any time and from time to time, in whole or in part.
- warrants exercisable for an aggregate of 3,616,944 shares of our common stock at an exercise price of $9.60 per share that expire on January 18, 2023 and may be exercised at any time and from time to time, in whole or in part.
- warrants exercisable for an aggregate of 41,177 shares of our common stock at an exercise price of $6.80 per share that expire on April 24, 2023 and may be exercised at any time and from time to time, in whole or in part.
- warrants exercisable for an aggregate of 932,812 shares of our common stock at an exercise price of $4.52 per share that expire on February 14, 2024 and may be exercised at any time and from time to time, in whole or in part.
- warrants exercisable for an aggregate of 531,250 shares of our common stock for which the aggregate exercise price was partially paid by the holders of the warrants on or prior to the date of issuance, which warrants expire on February 14, 2039 and may be exercised at any time and from time to time, in whole or in part, by payment of the remaining aggregate exercise price.

Each of the foregoing warrants have a net exercise provision under which their holders may, in lieu of payment of the exercise price in cash, surrender the warrant and receive a net amount of shares based on the fair market value of our stock at the time of exercise of the warrants after deduction of the aggregate exercise price. These warrants contain provisions for adjustment of the exercise price and number of shares issuable upon the exercise of warrants in the event of certain stock dividends, stock splits, reorganizations, reclassifications and consolidations.

Except for the right to participate in certain dividends and distributions and as otherwise provided in the warrants or by virtue of such holder's ownership of our common stock, the holders of the warrants do not have the rights or privileges of holders of our common stock, including any voting rights, until they exercise their warrants.

Our warrant agent is Computershare Trust Company, N.A.

Registration Rights

We are party to an amended and restated registration rights agreement with the holders of approximately 0.2 million shares of our common stock.

Demand Registration Rights

Under the amended and restated registration rights agreement, holders of registrable shares can demand that we file a registration statement or request that their shares be included on a registration statement that we are otherwise filing, in either case, registering the resale of their shares of common stock. These registration rights are subject to conditions and limitations, including the right, in certain circumstances, of the underwriters of an offering to limit the number of shares included in such

registration and our right, in certain circumstances, not to effect a requested registration within 90 days before or 180 days following our filing of a registration statement pertaining to an underwritten public offering of securities for our account.

Piggyback Registration Rights

If we propose to register any of our securities under the Securities Act of 1933, as amended, or the Securities Act, for our own account or the account of any other holder, the holders of registrable shares are entitled to notice of such registration and to request that we include registrable shares for resale on such registration statement, subject to the right of any underwriter to limit the number of shares included in such registration. These registration rights have been waived in connection with this offering.

Expenses of Registration; Indemnification

We will pay all expenses relating to any registration, other than underwriting discounts and commissions, subject to specified conditions and limitations.

The amended and restated registration rights agreement contains customary cross-indemnification provisions, pursuant to which we are obligated to indemnify the selling stockholders, in the event of misstatements or omissions in the registration statement attributable to us except in the event of fraud and they are obligated to indemnify us for misstatements or omissions attributable to them.

Termination of Registration Rights

The registration rights granted to any holder of registrable shares will terminate when all such holder's registrable securities have been sold or may be distributed without volume limitation or other restrictions on transfer under Rule 144 of the Securities Act.

Anti-Takeover Effects of Our Certificate of Incorporation and Our By-Laws

Our certificate of incorporation and by-laws contain certain provisions that are intended to enhance the likelihood of continuity and stability in the composition of the board of directors and which may have the effect of delaying, deferring or preventing a future takeover or change in control of the company unless such takeover or change in control is approved by the board of directors.

These provisions include:

Classified Board. Our certificate of incorporation provides that our board of directors is divided into three classes of directors, with the classes as nearly equal in number as possible. As a result, approximately one-third of our board of directors will be elected each year. The classification of directors will have the effect of making it more difficult for stockholders to change the composition of our board. Our certificate of incorporation also provides that, subject to any rights of holders of preferred stock to elect additional directors under specified circumstances, the number of directors will be fixed exclusively pursuant to a resolution adopted by our board of directors.

Action by Written Consent; Special Meetings of Stockholders. Our certificate of incorporation provides that stockholder action can be taken only at an annual or special meeting of stockholders and cannot be taken by written consent in lieu of a meeting. Our certificate of incorporation and the by-laws also provide that, except as otherwise required by law, special meetings of the stockholders can be called only by or at the direction of the board of directors pursuant to a resolution adopted by a majority of the total number of directors. Except as described above, stockholders are not be permitted to call a special meeting or to require the board of directors to call a special meeting.

Removal of Directors. Our certificate of incorporation provides that our directors may be removed only for cause by the affirmative vote of at least 75% of the voting power of our outstanding shares of capital stock, voting together as a single class. This requirement of a supermajority vote to remove directors could enable a minority of our stockholders to prevent a change in the composition of our board.

Advance Notice Procedures. Our by-laws establish an advance notice procedure for stockholder proposals to be brought before an annual meeting of our stockholders, including proposed nominations of persons for election to the board of directors. Stockholders at an annual meeting are only be able to consider proposals or nominations specified in the notice of meeting or brought before the meeting by or at the direction of the board of directors or by a stockholder who was a stockholder of record on the record date for the meeting, who is entitled to vote at the meeting and who has given our Secretary timely written notice, in

proper form, of the stockholder's intention to bring that business before the meeting. Although the by-laws do not give the board of directors the power to approve or disapprove stockholder nominations of candidates or proposals regarding other business to be conducted at a special or annual meeting, the by-laws may have the effect of precluding the conduct of certain business at a meeting if the proper procedures are not followed or may discourage or deter a potential acquirer from conducting a solicitation of proxies to elect its own slate of directors or otherwise attempting to obtain control of the company.

Super Majority Approval Requirements. The Delaware General Corporation Law generally provides that the affirmative vote of a majority of the shares entitled to vote on any matter is required to amend a corporation's certificate of incorporation or by-laws, unless either a corporation's certificate of incorporation or by-laws requires a greater percentage. Our certificate of incorporation and by-laws provide that the affirmative vote of holders of at least 75% of the total votes eligible to be cast in the election of directors is required to amend, alter, change or repeal the by-laws. This requirement of a supermajority vote to approve amendments to our by-laws could enable a minority of our stockholders to exercise veto power over any such amendments.

Authorized but Unissued Shares. Our authorized but unissued shares of common stock and preferred stock are available for future issuance, including this offering, without stockholder approval. These additional shares may be utilized for a variety of corporate purposes, including future public offerings to raise additional capital, corporate acquisitions and employee benefit plans. The existence of authorized but unissued shares of common stock and preferred stock could render more difficult or discourage an attempt to obtain control of a majority of our common stock by means of a proxy contest, tender offer, merger or otherwise.

Exclusive Forum. Our certificate of incorporation provides that, subject to limited exceptions, the state or federal courts located in the State of Delaware are the sole and exclusive forum for (i) any derivative action or proceeding brought on our behalf, (ii) any action asserting a claim of breach of a fiduciary duty owed by any of our directors, officers or other employees to us or our stockholders, (iii) any action asserting a claim against us arising pursuant to any provision of the Delaware General Corporation Law, our certificate of incorporation or our by-laws, or (iv) any other action asserting a claim against us that is governed by the internal affairs doctrine. Any person or entity purchasing or otherwise acquiring any interest in shares of our capital stock shall be deemed to have notice of and to have consented to the provisions of our certificate of incorporation described above. Although we believe these provisions benefit us by providing increased consistency in the application of Delaware law for the specified types of actions and proceedings, the provisions may have the effect of discouraging lawsuits against our directors and officers. The enforceability of similar choice of forum provisions in other companies' certificates of incorporation has been challenged in legal proceedings, and it is possible that, in connection with one or more actions or proceedings described above, a court could find the choice of forum provisions contained in our certificate of incorporation to be inapplicable or unenforceable.

Section 203 of the Delaware General Corporation Law

We are subject to the provisions of Section 203 of the Delaware General Corporation Law. In general, Section 203 prohibits a publicly-held Delaware corporation from engaging in a "business combination" with an "interested stockholder" for a three-year period following the time that this stockholder becomes an interested stockholder, unless the business combination is approved in a prescribed manner. A "business combination" includes, among other things, a merger, asset or stock sale or other transaction resulting in a financial benefit to the interested stockholder. An "interested stockholder" is a person who, together with affiliates and associates, owns, or did own within three years prior to the determination of interested stockholder status, 15% or more of the corporation's voting stock.

Under Section 203, a business combination between a corporation and an interested stockholder is prohibited unless it satisfies one of the following conditions: before the stockholder became interested, the board of directors approved either the business combination or the transaction which resulted in the stockholder becoming an interested stockholder; upon consummation of the transaction which resulted in the stockholder becoming an interested stockholder, the interested stockholder owned at least 85% of the voting stock of the corporation outstanding at the time the transaction commenced, excluding for purposes of determining the voting stock outstanding, shares owned by persons who are directors and also officers, and employee stock plans, in some instances; or at or after the time the stockholder became interested, the business combination was approved by the board of directors of the corporation and authorized at an annual or special meeting of the stockholders by the affirmative vote of at least two-thirds of the outstanding voting stock which is not owned by the interested stockholder.

A Delaware corporation may "opt out" of these provisions with an express provision in its original certificate of incorporation or an express provision in its certificate of incorporation or by-laws resulting from a stockholders' amendment approved by at least a majority of the outstanding voting shares. We have not opted out of these provisions. As a result, mergers or other takeover or change in control attempts of us may be discouraged or prevented.

Transfer Agent and Registrar

The transfer agent and registrar for our common stock is Computershare Trust Company, N.A. The transfer agent and registrar's address is 144 Fernwood Ave, Edison, New Jersey 08837.

Listing

Our common stock is listed on The Nasdaq Capital Market under the symbol "GNCA".

SHARES ELIGIBLE FOR FUTURE SALE

We cannot predict the effect, if any, that future sales of shares of common stock, or the availability for future sales of shares of common stock, will have on the market price of shares of our common stock prevailing from time to time. The sale of substantial amounts of shares of our common stock in the public market, or the perception that such sales could occur, could harm the prevailing market price of shares of our common stock.

Upon completion of this offering, we will have a total of 24,049,181 shares of our common stock outstanding (or 25,549,181 shares of common stock if the underwriters exercise in full their option to purchase additional shares of common stock), based upon 14,049,181 shares of our common stock that were outstanding at March 31, 2019, after giving effect to the reverse stock split effected on May 22, 2019.

Of those shares, we expect that 19.6 million shares, including the shares sold in this offering, will be freely tradeable without restriction under the Securities Act by persons other than our "affiliates." Under the Securities Act, an "affiliate" of an issuer is a person who directly or indirectly controls, is controlled by or is under common control with that issuer.

In addition, 1,575,150 shares of common stock may be granted under the Amended and Restated 2014 Equity Incentive Plan, which amount includes 1,303,407 shares subject to options outstanding as of March 31, 2019.

356,995 shares of our outstanding common stock will be "restricted securities" under Rule 144 promulgated under the Securities Act. Of these shares, 50,841 shares will be subject to a 90-day lock-up period under the lock-up agreements entered into in connection with this offering, as further described below. Upon expiration of the lock-up period, these restricted securities may be sold in the public market only if registered or pursuant to an exemption from registration, such as Rule 144.

Our amended and restated certificate of incorporation authorizes us to issue additional shares of common stock and options, rights and warrants relating to common stock for the consideration and on the terms and conditions established by our board of directors in its sole discretion. In accordance with the Delaware General Corporation Law and the provisions of our amended and restated certificate of incorporation, we may also issue preferred stock that has designations, preferences, rights, powers and duties that are different from, and may be senior to, those applicable to shares of common stock. See "Description of Capital Stock."

Lock-up Agreements

In connection with this offering, we, our directors, our executive officers and certain stockholders beneficially owning approximately 42.0% of our shares of common stock outstanding as of May 31, 2019, have agreed with the underwriters not to dispose of or hedge any shares of our common stock or securities convertible into or exchangeable for shares of common stock during the period from the date of the lock-up agreement continuing through the date 90 days after the date of this prospectus, except with the prior written consent of SVB Leerink LLC and Stifel, Nicolaus & Company, Incorporated, the representatives of the underwriters. The representatives of the underwriters have advised us that they have no current intent or arrangement to release any of the shares subject to the lock-up agreements prior to the expiration of the lock-up period.

The lock-up agreements do not contain any pre-established conditions to the waiver by SVB Leerink LLC and Stifel, Nicolaus & Company, Incorporated on behalf of the underwriters of any terms of the lock-up agreements. Any determination to release shares subject to the lock-up agreements would be based on a number of factors at the time of determination, including but not necessarily limited to the market price of the common stock, the liquidity of the trading market for the common stock, general market conditions, the number of shares proposed to be sold, contractual obligations to release certain shares subject to the lock-up agreements in the event any such shares are released, subject to certain specific limitations and thresholds, and the timing, purpose and terms of the proposed sale.

Following the lock-up periods set forth in the agreements described above, and assuming that the representatives of the underwriters do not release any parties from these agreements, all of the shares of our common stock that are restricted securities or are held by our affiliates as of the date of this prospectus will be eligible for sale in the public market in compliance with Rule 144 under the Securities Act.

Rule 144

In general, under Rule 144 a person (or persons whose shares are aggregated) who may be deemed our affiliate is entitled to sell within any three-month period a number of restricted securities that does not exceed the greater of 1% of the then outstanding shares of common stock and the average weekly trading volume during the four calendar weeks preceding each such sale, provided

that at least six months has elapsed since such shares of common stock were acquired from us or any affiliate of ours and certain manner of sale, notice requirements and requirements as to availability of current public information about us are satisfied.

Any person who is deemed to be our affiliate must also comply with such provisions of Rule 144 (other than the six-month holding period requirement) in order to sell shares of common stock which are not restricted securities (such as shares of common stock acquired by affiliates through purchases in the open market following this offering).

A person who is not our affiliate, and who has not been our affiliate at any time during the 90 days preceding any sale, is entitled to sell shares of common stock (i) subject only to the requirements as to availability of current public information about us, provided that a period of at least six months has elapsed since the shares of common stock were acquired from us or any affiliate of ours, and (ii) without regard to the requirements as to availability of current public information about us or any other requirement of Rule 144, provided that at least one year has elapsed since the shares of common stock were acquired from us or any affiliate of ours.

Registration Rights

The holders of 0.2 million shares of our common stock are entitled to specified rights with respect to the registration of the offer and sale of their shares under the Securities Act. Registration of the offer and sale of these shares under the Securities Act would result in the shares becoming freely tradable without restriction under the Securities Act immediately upon the effectiveness of the registration. See the section of this prospectus titled “Description of Capital Stock-Registration Rights” for additional information.

Stock Options and Form S-8 Registration Statement

As of May 31, 2019, we had outstanding options to purchase an aggregate of 1,288,590 shares of our common stock, of which options to purchase 349,244 shares were vested. We have filed a registration statement on Form S-8 under the Securities Act to register all of the shares of our common stock subject to outstanding options and other awards issuable pursuant to our equity plans. Accordingly, shares of our common stock registered under the registration statements will be available for sale in the open market, subject to Rule 144 volume limitations applicable to affiliates, and subject to any vesting restrictions and lock-up agreements applicable to these shares.

MATERIAL UNITED STATES FEDERAL INCOME AND ESTATE TAX CONSIDERATIONS FOR NON-U.S. HOLDERS

The following discussion summarizes certain material United States federal income and estate tax considerations relating to the purchase, ownership, and disposition of shares of our common stock by a non-U.S. holder (as defined below) that acquires our common stock in this offering and holds it as a capital asset within the meaning of Section 1221 of the Internal Revenue Code of 1986, as amended, or the Code. This discussion is based on the tax laws of the United States, including the Code, U.S. Treasury regulations promulgated or proposed thereunder, and administrative and judicial interpretations thereof, all as in effect on the date of this prospectus. These tax laws are subject to change, possibly with retroactive effect, and subject to differing interpretations that could affect the tax consequences described herein.

For purposes of this summary, a "Non-U.S. Holder" means a person (other than a partnership or any other entity or arrangement treated as a partnership for United States federal income tax purposes) that is not for U.S. federal income tax purposes any of the following:

- an individual citizen or resident of the United States;
- a corporation (or any other entity treated as a corporation for U.S. federal income tax purposes) created or organized in or under the laws of the United States, any state thereof or the District of Columbia;
- an estate the income of which is subject to U.S. federal income taxation regardless of its source; or
- a trust if it (1) is subject to the primary supervision of a court within the United States and one or more U.S. persons have the authority to control all substantial decisions of the trust or (2) has a valid election in effect under applicable U.S. Treasury regulations to be treated as a U.S. person.

This summary does not address all aspects of U.S. federal taxes, including the alternative minimum tax, or the Medicare tax on net investment income, and does not address any foreign, state, local or other tax considerations that may be relevant to Non-U.S. Holders in light of their personal circumstances. In addition, this discussion does not address all aspects of United States federal income and estate taxation that may be applicable to non-U.S. holders in light of their particular circumstances or status, including, for example, including a holder that is a U.S. expatriate, "controlled foreign corporation," "passive foreign investment company," "real estate investment trust," "regulated investment company," a person who has a functional currency other than the U.S. dollar, person that owns, or has owned, actually or constructively, more than 5% of our common stock, a person who acquired our common stock as compensation for services, a person required to recognize any items of gross income with respect to our common stock being taken into account in an applicable financial statement, financial institutions, banks, investment funds, broker-dealers or traders in securities, insurance companies, partnerships or other pass-through entities, corporations that accumulate earnings to avoid U.S. federal income tax, certain United States expatriates, tax-exempt organizations, pension plans, persons in special situations, such as those that have elected to mark securities to market or that hold shares of our common stock as part of a straddle, hedge or other integrated investment, and foreign governments or agencies.

If a partnership (including any entity or arrangement treated as a partnership for United States federal income tax purposes) purchases, owns, or disposes of our common stock, the tax treatment of a person treated as a partner in the partnership for United States federal income tax purposes generally will depend on the status of the partner and the activities of the partnership. Partnerships (and other entities or arrangements so treated for United States federal income tax purposes) and their partners should consult their own tax advisors.

THIS SUMMARY IS FOR GENERAL INFORMATION ONLY AND IS NOT INTENDED TO BE TAX ADVICE. NON-U.S. HOLDERS ARE URGED TO CONSULT THEIR TAX ADVISORS CONCERNING THE U.S. FEDERAL INCOME AND ESTATE TAXATION, STATE, LOCAL AND NON-U.S. TAXATION AND OTHER TAX CONSEQUENCES TO THEM OF THE PURCHASE, OWNERSHIP AND DISPOSITION OF OUR COMMON STOCK.

Distributions on Our Common Stock

As discussed under "Dividend Policy" above, we do not anticipate paying any cash dividends in the foreseeable future. If we do make a distribution of cash or property with respect to our common stock, any such distribution generally will constitute a dividend for United States federal income tax purposes to the extent of our current or accumulated earnings and profits, as determined under United States federal income tax principles. Subject to the discussion below under "FATCA Withholding "and "Information Reporting and Backup Withholding," any such dividend paid to a non-U.S. holder generally will be subject to withholding tax at a 30% rate or at a lower rate under an applicable income tax treaty between the United States and the non-U.S. holder's country of residence. In order to receive a reduced treaty withholding tax rate and to avoid backup withholding, as

described below, a non-U.S. holder must furnish to us or our paying agent a properly executed Internal Revenue Service Form W-8BEN or Form W-8BEN-E (or other applicable form) prior to payment of the dividend, certifying under penalties of perjury that the non-U.S. holder is entitled to a reduction in withholding under an applicable income tax treaty. A non-U.S. holder that holds our common stock through a financial institution or other agent will be required to provide appropriate documentation to the financial institution or other agent, which then will be required to provide certification to us or our paying agent either directly or through other intermediaries. A non-U.S. holder that is eligible for a reduced rate of withholding tax pursuant to an income tax treaty may obtain a refund of any excess amounts withheld by filing a refund claim with the Internal Revenue Service.

A non-U.S. holder is exempt from the withholding tax described above if the dividend is "effectively connected" with the conduct of a trade or business in the United States of the non-U.S. holder (and, if an applicable income tax treaty so provides, attributable to a permanent establishment or fixed base maintained by the non-U.S. holder in the United States) and the non-U.S. holder furnishes to us or our paying agent an Internal Revenue Service Form W-8ECI (or applicable successor form), certifying under penalties of perjury that the dividend is effectively connected with the non-U.S. holder's conduct of a trade or business in the United States (and, if an applicable income tax treaty so provides, attributable to a permanent establishment or fixed base maintained in the United States). "Effectively connected" dividends will generally be subject to United States federal income tax at the graduated rates that also apply to U.S. persons. A corporate non-U.S. holder may, under certain circumstances, be subject to an additional branch profits tax at a 30% rate (or at a lower rate under an applicable income tax treaty) with respect to its ''effectively connected'' dividends.

Any distribution in excess of our current or accumulated earnings and profits will be treated, first, as a tax-free return of the non-U.S. holder's capital, up to the holder's adjusted tax basis in shares of our common stock, and thereafter, as capital gain subject to the tax treatment described below in "Gain on Sale, Exchange or Other Taxable Disposition."

Gain on Sale, Exchange or Other Taxable Disposition

Subject to the discussion below under "FATCA Withholding" and "Information Reporting and Backup Withholding", a non-U.S. holder generally will not be subject to United States federal income tax or withholding tax on gain realized upon a sale, exchange or other taxable disposition of shares of our common stock (including a redemption, but only if the redemption would be treated as a sale or exchange rather than a distribution for United States federal income tax purposes) unless:

- the gain is "effectively connected" with the conduct of a trade or business of the non-U.S. holder in the United States (and, if required by an applicable income tax treaty, attributable to a permanent establishment or fixed base maintained in the United States), in which case the non-U.S. holder generally will be subject to United States federal income tax on a net income basis with respect to such gain in the same manner as if such holder were a resident of the United States and, if the non-U.S. holder is a corporation for United States federal income tax purposes, will be subject to an additional ''branch profits tax'' at a 30% rate (or at a lower rate under an applicable income tax treaty);
- the non-U.S. holder is an individual who is present in the United States for 183 or more days in the taxable year of the disposition and meets certain other conditions, in which case the non-U.S. holder generally will be subject to United States federal income tax at a 30% rate (or at a lower rate under an applicable income tax treaty) on the gain derived from the sale, which gain may be offset by U.S.-source capital losses for the year; or
- we are or have been a "United States real property holding corporation" ("USRPHC") at any time within the shorter of the five-year period preceding the disposition and the non-U.S. holder's holding period for our common stock (the "relevant period") and the non-U.S. holder (i) disposes of our common stock during a calendar year when our common stock is no longer regularly traded on an established securities market or (ii) owned (directly, indirectly and constructively) more than 5% of our common stock at any time during the relevant period, in which case such a non-U.S. holder will be subject to tax on the gain on the disposition of shares of our common stock generally as if the gain were effectively connected with the conduct of a trade or business in the United States, except that the "branch profits tax" will not apply. We believe we currently are not, and we do not anticipate becoming, a USRPHC for United States federal income tax purposes. Generally, a corporation is a USRPHC only if the fair market value of its United States real property interests (as defined in the Code) equals or exceeds 50% of the sum of the fair market value of its worldwide real property interests and its other assets used or held for use in a trade or business. If we are a USRPHC and our common stock is not regularly traded on an established securities market, a non-U.S. holder's proceeds received on the disposition of common stock will also generally be subject to withholding at a rate of 15%. Non-U.S. holders should consult their own tax advisors about the consequences that could result if we are, or become, a URSPHC.

FATCA Withholding

Sections 1471 through 1474 of the Code and related Treasury Regulations, together with other Treasury Department or IRS guidance issued thereunder (''FATCA'') impose a 30% withholding tax on certain payments unless:

- the foreign entity (i) is a "foreign financial institution" (as defined under FATCA) that undertakes specified due diligence, reporting, withholding and certification obligations or (ii) in the case of a foreign financial institution that is a resident in a jurisdiction that has entered into an intergovernmental agreement with the United States relating to FATCA, complies with the diligence and reporting requirements of the intergovernmental agreement and local implementing rules;
- the foreign entity is a "non-financial foreign entity" (as defined under FATCA) and identifies certain of its U.S. investors or that it does not have such U.S. investors, generally on Internal Revenue Service Form W-8BEN-E; or
- the foreign entity otherwise is exempted from withholding under FATCA.

Withholding under FATCA generally applies to payments of dividends on our common stock and, after December 31, 2018, to payments of gross proceeds from a sale or other disposition of our common stock. Withholding agents may, however, rely on recently proposed Treasury Regulations that, finalized in their current form, would no longer require FATCA withholding on payments of gross proceeds.

An intergovernmental agreement between the United States and an applicable foreign country where a foreign entity is a resident may modify the requirements under FATCA in the previous paragraph and, under certain circumstances, can eliminate FATCA withholding tax. Under certain circumstances, a non-U.S. holder will be eligible for refunds or credits of withholding taxes imposed under FATCA by filing a United States federal income tax return. Prospective investors should consult their tax advisors regarding the effect of FATCA on their ownership and disposition of our common stock.

Information Reporting and Backup Withholding

Except as described below, a non-U.S. holder generally will be exempt from backup withholding and information reporting requirements with respect to dividend payments and the payment of the proceeds from the sale of shares or our common stock effected at a United States office of a broker, as long as the payor or broker does not have actual knowledge or reason to know that the holder is a United States person and has furnished to the payor or broker:

- a valid Internal Revenue Service Form W-8BEN or Form W-8BEN-E on which the non-U.S. holder certifies, under penalties of perjury, that it is a non-United States person; or
- other documentation upon which it may rely to treat the payments as made to a non-United States person in accordance with Treasury regulations, or the non-U.S. holder otherwise establishes an exemption.

However, we must report annually to the Internal Revenue Service and to non-U.S. holders the amount of dividends paid to non-U.S. holders and the tax withheld with respect to such dividends, regardless of whether withholding was required. Copies of the information returns reporting such dividends and withholding may also be made available to the tax authorities in the country in which the respective non-U.S. holder resides under the provisions of an applicable income tax treaty.

Payment of the proceeds from the sale of our common stock effected at a foreign office of a broker generally will not be subject to information reporting or backup withholding. However, a sale of our common stock by a non-U.S. holder that is effected at a foreign office of a broker will be subject to information reporting and backup withholding if:

- the proceeds are transferred to an account maintained by the non-U.S. holder in the United States;
- the payment of proceeds or the confirmation of the sale is mailed to the non-U.S. holder at a United States address; or
- the sale has some other specified connection with the United States as provided in the Treasury regulations,

unless the broker does not have actual knowledge or reason to know that the holder is a United States person and the documentation requirements described above are met or the non-U.S. holder otherwise establishes an exemption.

In addition, a sale of shares of our common stock will be subject to information reporting if it is effected at a foreign office of a broker that is:

- a United States person under Section 7701(a)(30) of the Code;
- a ''controlled foreign corporation'' for United States federal income tax purposes;

- a foreign person 50% or more of whose gross income is effectively connected with the conduct of a United States trade or business for a specified three-year period (or such part of such period as the person has been in existence); or
- a foreign partnership, if at any time during its tax year (a) one or more of its partners are "U.S. persons", as defined in the Treasury regulations, who in the aggregate hold more than 50% of the income or capital interest in the partnership, or (b) such foreign partnership is engaged in the conduct of a trade or business in the United States,

unless the broker does not have actual knowledge or reason to know that the holder is a United States person and the documentation requirements described above are met or an exemption is otherwise established. Backup withholding will apply if the sale is subject to information reporting and the broker has actual knowledge that the holder is a United States person.

Backup withholding is not an additional tax. A non-U.S. holder generally may obtain a refund of any amounts withheld under the backup withholding rules that exceed the non-U.S. holder's income tax liability by filing a refund claim with the Internal Revenue Service.

Federal Estate Tax

The estates of nonresident alien decedents generally are subject to United States federal estate tax on property with a United States situs. Because we are a United States corporation, our common stock will be United States situs property and therefore will be included in the taxable estate of a nonresident alien decedent at the time of the decedent's death, unless an applicable estate tax treaty between the United States and the decedent's country of residence provides otherwise. An estate tax credit is available to reduce the net tax liability of a nonresident alien's estate, but the estate tax credit for a nonresident alien is generally much smaller than the applicable credit for computing the estate tax of a United States resident. Nonresident aliens should consult their personal tax advisors regarding the United States federal estate tax consequences of owning our common stock.

UNDERWRITING

SVB Leerink LLC and Stifel, Nicolaus & Company, Incorporated are acting as representatives of each of the underwriters named below and as joint bookrunning managers for this offering. Subject to the terms and conditions set forth in the underwriting agreement among us and the underwriters, we have agreed to sell to the underwriters, and each of the underwriters has agreed, severally and not jointly, to purchase from us, the number of shares of common stock set forth opposite its name below.

Underwriter	Number of Shares
SVB Leerink LLC	
Stifel, Nicolaus & Company, Incorporated	
Robert W. Baird & Co. Incorporated	
Needham & Company, LLC	
Total	10,000,000

Subject to the terms and conditions set forth in the underwriting agreement, the underwriters have agreed, severally and not jointly, to purchase all of the shares sold under the underwriting agreement if any of the shares are purchased. If an underwriter defaults, the underwriting agreement provides that the purchase commitments of the non-defaulting underwriters may be increased or the underwriting agreement may be terminated.

We have agreed to indemnify the underwriters against certain liabilities, including liabilities under the Securities Act, or to contribute to payments the underwriters may be required to make in respect of those liabilities.

The underwriters are offering the shares, subject to prior sale, when, as and if issued to and accepted by them, subject to approval of legal matters by their counsel, including the validity of the shares, and subject to other conditions contained in the underwriting agreement, such as the receipt by the underwriters of officers' certificates and legal opinions. The underwriters reserve the right to withdraw, cancel or modify offers to the public and to reject orders in whole or in part.

Commissions and Discounts

The representatives have advised us that the underwriters propose initially to offer the shares to the public at the public offering price set forth on the cover page of this prospectus and to dealers at that price less a concession not in excess of $ per share. After the initial offering of the shares, the public offering price, concession or any other term of this offering may be changed by the representatives.

The following table shows the public offering price, underwriting discounts and commissions and proceeds, before expenses, to us. The information assumes either no exercise or full exercise by the underwriters of their option to purchase additional shares of our common stock.

		Total	
	Per Share	Without Option	With Option
Public offering price	$	$	$
Underwriting discounts and commissions	$	$	$
Proceeds, before expenses, to us	$	$	$

We estimate expenses payable by us in connection with this offering, other than the underwriting discounts and commissions referred to above, will be approximately $1.8 million. We also have agreed to reimburse the underwriters for up to $30,000 for their FINRA counsel fee. In accordance with FINRA Rule 5110, this reimbursed fee is deemed underwriting compensation for this offering.

Option to Purchase Additional Shares

We have granted an option to the underwriters, exercisable for 30 days after the date of this prospectus, to purchase up to 1,500,000 additional shares at the public offering price, less underwriting discounts and commissions. If the underwriters exercise this option, each underwriter will be obligated, subject to the conditions contained in the underwriting agreement, to purchase a number of additional shares proportionate to that underwriter's initial amount reflected in the above table.

No Sales of Similar Securities

We, our executive officers and directors and certain of our other existing security holders have agreed not to sell or transfer any common stock or securities convertible into or exchangeable or exercisable for common stock, for 90 days after the date of this prospectus without first obtaining the written consent of SVB Leerink LLC and Stifel, Nicolaus & Company, Incorporated on behalf of the underwriters. Specifically, we and these other persons have agreed, with certain limited exceptions, not to directly or indirectly:

- offer, sell, contract to sell, pledge or otherwise dispose of (or enter into any transaction which is designed to, or might reasonably be expected to, result in the disposition (whether by actual disposition or effective economic disposition due to cash settlement or otherwise)), directly or indirectly, including the filing (or participation in the filing) of a registration statement with the SEC in respect of, or establish or increase a put equivalent position or liquidate or decrease a call equivalent position within the meaning of Section 16 of the Exchange Act, any shares of common stock, options or warrants to acquire shares of common stock, or securities exchangeable or exercisable for or convertible into shares of common stock currently or hereafter owned either of record or beneficially; or
- publicly announce an intention to do any of the foregoing for a period of 90 days after the date of this prospectus.

The lock-up provisions apply to common stock and to securities convertible into or exchangeable or exercisable for common stock. They also apply to common stock owned now or acquired later by the person executing the lock-up agreement or for which the person executing the lock-up agreement later acquires the power of disposition.

Nasdaq Capital Market Listing

Our common stock is listed on the Nasdaq Capital Market under the symbol "GNCA."

Price Stabilization, Short Positions and Penalty Bids

Until the distribution of the shares is completed, SEC rules may limit underwriters and selling group members from bidding for and purchasing our common stock. However, the representatives may engage in transactions that stabilize the price of the common stock, such as bids or purchases to peg, fix or maintain that price.

In connection with this offering, the underwriters may purchase and sell our common stock in the open market. These transactions may include short sales, purchases on the open market to cover positions created by short sales and stabilizing transactions. Short sales involve the sale by the underwriters of a greater number of shares than they are required to purchase in this offering. "Covered" short sales are sales made in an amount not greater than the underwriters' option to purchase additional shares described above. The underwriters may close out any covered short position by either exercising their option to purchase additional shares or purchasing shares in the open market. In determining the source of shares to close out the covered short position, the underwriters will consider, among other things, the price of shares available for purchase in the open market as compared to the price at which they may purchase shares through the option to purchase additional shares granted to them under the underwriting agreement described above. "Naked" short sales are sales in excess of such option. The underwriters must close out any naked short position by purchasing shares in the open market. A naked short position is more likely to be created if the underwriters are concerned that there may be downward pressure on the price of our common stock in the open market after pricing that could adversely affect investors who purchase in this offering. Stabilizing transactions consist of various bids for or purchases of shares of common stock made by the underwriters in the open market prior to the closing of this offering.

The underwriters may also impose a penalty bid. This occurs when a particular underwriter repays to the underwriters a portion of the underwriting discount received by it because the representatives have repurchased shares sold by or for the account of such underwriter in stabilizing or short covering transactions.

Similar to other purchase transactions, the underwriters' purchases to cover the syndicate short sales may have the effect of raising or maintaining the market price of our common stock or preventing or retarding a decline in the market price of our common stock. As a result, the price of our common stock may be higher than the price that might otherwise exist in the open market. The underwriters may conduct these transactions on the Nasdaq Capital Market, in the over-the-counter market or otherwise.

Neither we nor any of the underwriters make any representation or prediction as to the direction or magnitude of any

effect that the transactions described above may have on the price of our common stock. In addition, neither we nor any of the underwriters make any representation that the representatives will engage in these transactions or that these transactions, once commenced, will not be discontinued without notice.

The underwriters may also engage in passive market making transactions in our common stock on the Nasdaq Capital Market in accordance with Rule 103 of Regulation M during a period before the commencement of offers or sales of shares of our common stock in this offering and extending through the completion of distribution. A passive market maker must display its bid at a price not in excess of the highest independent bid of that security. However, if all independent bids are lowered below the passive market maker's bid, that bid must then be lowered when specified purchase limits are exceeded.

Electronic Distribution

In connection with this offering, certain of the underwriters or securities dealers may distribute prospectuses by electronic means, such as e-mail.

Other Relationships

The underwriters and certain of their affiliates are full service financial institutions engaged in various activities, which may include securities trading, commercial and investment banking, financial advisory, investment management, investment research, principal investment, hedging, financing and brokerage activities. Some of the underwriters and certain of their affiliates may in the future engage in investment banking and other commercial dealings in the ordinary course of business with us and our affiliates, for which they may in the future receive customary fees, commissions and expenses.

In addition, in the ordinary course of their business activities, the underwriters and their affiliates may make or hold a broad array of investments and actively trade debt and equity securities (or related derivative securities) and financial instruments (including bank loans) for their own account and for the accounts of their customers. Such investments and securities activities may involve securities and/or instruments of ours or our affiliates. The underwriters and their affiliates may also make investment recommendations and/or publish or express independent research views in respect of such securities or financial instruments and may hold, or recommend to clients that they acquire, long and/or short positions in such securities and instruments.

Selling Restrictions

Notice to Prospective Investors in the European Economic Area

In relation to each Member State of the European Economic Area which has implemented the Prospectus Directive (each, a "Relevant Member State"), with effect from and including the date on which the Prospectus Directive is implemented in that Relevant Member State, no offer of shares may be made to the public in that Relevant Member State other than:

A. to any legal entity which is a qualified investor as defined in the Prospectus Directive;

B. to fewer than 150 natural or legal persons (other than qualified investors as defined in the Prospectus Directive), as permitted under the Prospectus Directive, subject to obtaining the prior consent of the representatives; or

C. in any other circumstances falling within Article 3(2) of the Prospectus Directive,

provided that no such offer of shares shall require the Company or the representatives to publish a prospectus pursuant to Article 3 of the Prospectus Directive or supplement a prospectus pursuant to Article 16 of the Prospectus Directive.

Each person in a Relevant Member State who initially acquires any shares or to whom any offer is made will be deemed to have represented, acknowledged and agreed that it is a "qualified investor" within the meaning of the law in that Relevant Member State implementing Article 2(1)(e) of the Prospectus Directive. In the case of any shares being offered to a financial intermediary as that term is used in Article 3(2) of the Prospectus Directive, each such financial intermediary will be deemed to have represented, acknowledged and agreed that the shares acquired by it in the offer have not been acquired on a non-discretionary basis on behalf of, nor have they been acquired with a view to their offer or resale to, persons in circumstances which may give rise to an offer of any shares to the public other than their offer or resale in a Relevant Member State to qualified investors as so defined or in circumstances in which the prior consent of the representatives has been obtained to each such proposed offer or resale.

We, the representatives and each of our and the representatives' affiliates will rely upon the truth and accuracy of the

foregoing representations, acknowledgements and agreements.

This prospectus has been prepared on the basis that any offer of shares in any Relevant Member State will be made pursuant to an exemption under the Prospectus Directive from the requirement to publish a prospectus for offers of shares. Accordingly, any person making or intending to make an offer in that Relevant Member State of shares which are the subject of the offering contemplated in this prospectus may only do so in circumstances in which no obligation arises for the company or any of the underwriters to publish a prospectus pursuant to Article 3 of the Prospectus Directive in relation to such offer. Neither we nor the underwriters have authorized, nor do they authorize, the making of any offer of shares in circumstances in which an obligation arises for the company or the underwriters to publish a prospectus for such offer.

For the purpose of the above provisions, the expression "an offer to the public" in relation to any shares in any Relevant Member State means the communication in any form and by any means of sufficient information on the terms of the offer and the shares to be offered so as to enable an investor to decide to purchase or subscribe the shares, as the same may be varied in the Relevant Member State by any measure implementing the Prospectus Directive in the Relevant Member State and the expression "Prospectus Directive" means Directive 2003/71/EC (including the 2010 PD Amending Directive, to the extent implemented in the Relevant Member States) and includes any relevant implementing measure in the Relevant Member State and the expression "2010 PD Amending Directive" means Directive 2010/73/EU.

MiFID II Product Governance

Any person offering, selling or recommending the shares (a "distributor") should take into consideration the manufacturers' target market assessment; however, a distributor subject to MiFID II is responsible for undertaking its own target market assessment in respect of the shares (by either adopting or refining the manufacturers' target market assessment) and determining appropriate distribution channels.

Notice to Prospective Investors in the United Kingdom

In addition, in the United Kingdom, this document is being distributed only to, and is directed only at, and any offer subsequently made may only be directed at persons who are "qualified investors" (as defined in the Prospectus Directive) (i) who have professional experience in matters relating to investments falling within Article 19(5) of the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005, as amended (the "Order") and/or (ii) who are high net worth companies (or persons to whom it may otherwise be lawfully communicated) falling within Article 49(2)(a) to (d) of the Order (all such persons together being referred to as "relevant persons") or otherwise in circumstances which have not resulted and will not result in an offer to the public of the shares in the United Kingdom within the meaning of the Financial Services and Markets Act 2000.

Any person in the United Kingdom that is not a relevant person should not act or rely on the information included in this document or use it as basis for taking any action. In the United Kingdom, any investment or investment activity that this document relates to may be made or taken exclusively by relevant persons.

Notice to Prospective Investors in Canada

The shares may be sold only to purchasers purchasing, or deemed to be purchasing, as principal that are accredited investors, as defined in National Instrument 45-106 Prospectus Exemptions or subsection 73.3(1) of the Securities Act (Ontario), and are permitted clients, as defined in National Instrument 31-103 Registration Requirements, Exemptions and Ongoing Registrant Obligations. Any resale of the shares must be made in accordance with an exemption from, or in a transaction not subject to, the prospectus requirements of applicable securities laws.

Securities legislation in certain provinces or territories of Canada may provide a purchaser with remedies for rescission or damages if this prospectus (including any amendment thereto) contains a misrepresentation, provided that the remedies for rescission or damages are exercised by the purchaser within the time limit prescribed by the securities legislation of the purchaser's province or territory. The purchaser should refer to any applicable provisions of the securities legislation of the purchaser's province or territory for particulars of these rights or consult with a legal advisor.

Pursuant to section 3A.3 of National Instrument 33-105 Underwriting Conflicts (NI 33-105), the underwriters are not required to comply with the disclosure requirements of NI 33-105 regarding underwriter conflicts of interest in connection with this offering.

LEGAL MATTERS

The validity of the issuance of our common stock offered in this prospectus will be passed upon for us by Ropes & Gray LLP, Boston, Massachusetts. Cooley LLP is acting as counsel for the underwriters in connection with this offering.

EXPERTS

The financial statements of Genocea Biosciences, Inc. appearing in Genocea Biosciences, Inc.'s Annual Report on Form 10-K for the year ended December 31, 2018 have been audited by Ernst & Young LLP, independent registered public accounting firm, as set forth in its report thereon, included therein, and incorporated herein by reference. Such financial statements are incorporated herein by reference in reliance upon such report given on the authority of such firm as experts in accounting and auditing.

WHERE YOU CAN FIND MORE INFORMATION

We have filed with the SEC a registration statement on Form S-1 under the Securities Act with respect to the shares of common stock offered hereby. This prospectus, which constitutes a part of the registration statement, does not contain all of the information set forth in the registration statement or the exhibits and schedules filed therewith. For further information with respect to us and the common stock offered hereby, reference is made to the registration statement and the exhibits and schedules filed therewith. Statements contained in this prospectus regarding the contents of any contract or any other document that is filed as an exhibit to the registration statement are not necessarily complete, and each such statement is qualified in all respects by reference to the full text of such contract or other document filed as an exhibit to the registration statement.

We are subject to the information and periodic reporting requirements of the Exchange Act and, in accordance therewith, file periodic reports, proxy statements and other information with the SEC. The SEC maintains a website that contains reports, proxy and information statements and other information regarding registrants that file electronically with the SEC. The address is www.sec.gov.

We also maintain a website at http://www.genocea.com and make available free of charge through this website our Annual Report on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, proxy statements and amendments to those reports filed or furnished pursuant to Sections 13(a) and 15(d) of the Exchange Act. We make these reports available through our website as soon as reasonably practicable after we electronically file such reports with, or furnish such reports to, the SEC. The information contained on, or that can be accessed through, our website is not a part of this prospectus. The reference to our web address does not constitute incorporation by reference of the information contained in, or that can be accessed through, our website.

INCORPORATION OF DOCUMENTS BY REFERENCE

The SEC allows us to "incorporate by reference" information from other documents that we file with it, which means that we can disclose important information to you by referring you to those documents. The information incorporated by reference is considered to be part of this prospectus.

Information in this prospectus supersedes information incorporated by reference that we filed with the SEC prior to the date of this prospectus.

We are incorporating by reference into this prospectus and the registration statement of which this prospectus is a part the filings listed below and any additional documents that we may file with the SEC (File No. 001-36289) pursuant to Section 13(a), 13(c), 14 or 15(d) of the Exchange Act on or after the date we file this prospectus and prior to the termination of the offering, except we are not incorporating by reference any information furnished (but not filed) under Item 2.02 or Item 7.01 of any Current Report on Form 8-K and corresponding information furnished under Item 9.01 as an exhibit thereto:

- our Annual Report on Form 10-K for the fiscal year ended December 31, 2018, filed on February 28, 2019;
- our Quarterly Report on Form 10-Q for the quarter ended March 31, 2019, filed on April 30, 2019;
- the information specifically incorporated by reference into our Annual Report on Form 10-K for the year ended December 31, 2018 from our definitive proxy statement on Schedule 14A, filed on March 29, 2019; and
- our Current Reports on Form 8-K filed on February 12, 2019, February 28, 2019 (with respect to Item 5.02 contained therein) and May 21, 2019.

Any statement contained in a document incorporated or deemed to be incorporated by reference in this prospectus will be deemed modified, superseded or replaced for purposes of this prospectus to the extent that a statement contained in this prospectus modifies, supersedes or replaces such statement.

You may request, orally or in writing, a copy of any or all of the documents incorporated herein by reference. These documents will be provided to you at no cost, by contacting: Investor Relations, Genocea Biosciences, Inc. 100 Acorn Park Drive, Cambridge, Massachusetts 02140, (617) 876-8191 email address: ir@genocea.com. In addition, copies of any or all of the documents incorporated herein by reference may be accessed at our website at www.genocea.com. The information contained in, or accessible through, our website does not constitute part of this prospectus.

10,000,000 Shares

Common Stock

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PRELIMINARY PROSPECTUS

, 2019

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SVB Leerink **Stifel**

Baird **Needham & Company**

PART II

INFORMATION NOT REQUIRED IN PROSPECTUS

Item 13. Other Expenses of Issuance and Distribution

The following table sets forth the costs and expenses, other than the underwriting discounts and commissions, payable by the registrant in connection with the sale of common stock being registered. All amounts are estimates except for the SEC registration fee and the Financial Industry Regulatory Authority, or FINRA, filing fee.

Item	Amount to be paid
SEC registration fee	$ 7,401
FINRA filing fee	9,660
Printing expenses	25,000
Legal fees and expenses	300,000
Accounting fees and expenses	25,000
Transfer Agent fees and expenses	5,000
Miscellaneous expenses	1,452,939
Total	$ 1,825,000

Item 14. Indemnification of Directors and Officers

Section 145 of the General Corporation Law of the State of Delaware provides as follows:

A corporation shall have the power to 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, whether civil, criminal, administrative or investigative (other than an action by or in the right of the corporation) by reason of the fact that the person is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent 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 him in connection with such action, suit or proceeding if the person acted in good faith and in a manner the person reasonably believed to be in or not opposed to the best interest of the corporation, and, with respect to any criminal action or proceeding, had no reasonable cause to believe his conduct was unlawful. The termination of any action, suit or proceeding by judgment, order, settlement, conviction or upon a plea of nolo contendere or its equivalent shall not, of itself, create a presumption that the person did not act in good faith and in a manner which the person reasonably believed to be in or not opposed to the best interests of the corporation, and, with respect to any criminal action or proceeding, had reasonable cause to believe that his conduct was unlawful.

A corporation shall have the power to indemnify any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action or suit by or in the right of the corporation to procure a judgment in its favor by reason of the fact that the person is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise against expenses (including attorneys' fees) actually and reasonably incurred by him in connection with the defense or settlement of such action or suit if the person acted in good faith and in a manner the person reasonably believed to be in or not opposed to the best interests of the corporation and except that no indemnification shall be made with respect to any claim, issue or matter as to which such person shall have been adjudged to be liable to the corporation unless and only to the extent that the Court of Chancery or the court in which such action or suit was brought shall determine upon application that, despite the adjudication of liability but in view of all the circumstances of the case, such person is fairly and reasonably entitled to indemnity for such expenses which the Court of Chancery or such other court shall deem proper.

As permitted by the Delaware General Corporation Law, we have included in our certificate of incorporation a provision to eliminate the personal liability of our directors for monetary damages for breach of their fiduciary duties as directors, subject to certain exceptions. In addition, our certificate of incorporation and by-laws provide that we are required to indemnify our officers and directors under certain circumstances, including those circumstances in which indemnification would otherwise be discretionary, and we are required to advance expenses to our officers and directors as incurred in connection with proceedings against them for which they may be indemnified.

We entered into indemnification agreements with our directors and officers that provide broader indemnity rights than those provided under the Delaware General Corporation Law and our certificate of incorporation. The indemnification agreements are not intended to deny or otherwise limit third-party or derivative suits against us or our directors or officers, but to the extent a director or officer were entitled to indemnity or contribution under the indemnification agreement, the financial burden of a third-party suit would be borne by us, and we would not benefit from derivative recoveries against the director or officer. Such recoveries would accrue to our benefit but would be offset by our obligations to the director or officer under the indemnification agreement.

The underwriting agreement provides that the underwriters are obligated, under certain circumstances, to indemnify our directors, officers and controlling persons against certain liabilities, including liabilities under the Securities Act. Reference is made to the form of underwriting agreement filed as Exhibit 1.1 hereto.

We maintain directors' and officers' liability insurance for the benefit of our directors and officers.

Item 15. Recent Sales of Unregistered Securities

In the three years preceding the filing of this registration statement, we have issued the following securities that were not registered under the Securities Act.

Sales of Common Stock and Warrants

On February 14, 2019, we sold 3.2 million shares of common stock and 531 thousand pre-funded warrants to purchase common stock, along with accompanying warrants to purchase 0.25 shares of common stock for each share of common stock or pre-funded warrant purchased, for net proceeds of approximately $14.0 million.

On April 24, 2018, we issued warrants to purchase 41 thousand shares of our common stock at an exercise price of $6.80 per share to Hercules Capital Inc.

Issuances of common stock, pre-funded warrants and warrants were exempt pursuant to Rule 506 and Section 4(a)(2) of the Securities Act.

Item 16. Exhibits

(a) Exhibits

Exhibit No.	Exhibit
1.1	Form of Underwriting Agreement
3.1	Fifth Amended and Restated Certificate of Incorporation (incorporated by reference to Exhibit 3.1 to the Company's Current Report on Form 8-K, File No. 001-36289, filed on February 12, 2014)
3.2	Certificate of Amendment to Restated Certificate of Incorporation (incorporated by reference to Exhibit 3.1 to the Company's Current Report on Form 8-K, File No. 001-36289, filed on May 21, 2019)
3.3	Certificate of Amendment to Restated Certificate of Incorporation (incorporated by reference to Exhibit 3.1 to the Company's Current Report on Form 8-K, File No. 001-36289, filed on June 25, 2018)
3.4	Amended and Restated By-laws (incorporated by reference to Exhibit 3.2 to the Company's Current Report on Form 8-K, File No. 001-36289, filed on February 12, 2014)
4.1	Form of Common Stock Certificate (incorporated by reference to Exhibit 4.1 to the Company's Registration Statement on Form S-1, File No. 333-193043, filed on December 23, 2013)
4.2	Fourth Amended and Restated Registration Rights Agreement (incorporated by reference to Exhibit 4.5 to the Company's Registration Statement on Form S-1, File No. 333-193043, filed on December 23, 2013)
4.3	Warrant Agreement between the Company and Hercules Technology Growth Capital, Inc., dated November 20, 2014 (incorporated by reference to Exhibit 4.1 to the Company's Current Report on Form 8-K, File No. 001-36289, filed on November 21, 2014)

4.4	Certificate of Designation of Preferences, Rights and Limitations of Series A Convertible Preferred Stock (incorporated by reference to Exhibit 4.1 to the Company's Current Report on Form 8-K, File No. 001-36289 filed on January 19, 2018)
4.5	Form of Class A Warrant to Purchase Shares of Common Stock of Genocea Biosciences, Inc. (incorporated by reference to Exhibit 4.5 to the Company's Annual Report on Form 8-K, File No. 001-36289, filed on February 16, 2018)
4.6	Warrant Agreement between the Company and Hercules Capital, Inc., dated April 24, 2018 (incorporated by reference to Exhibit 4.1 to the Company's Current Report on Form 8-K, File No. 001-36289, filed on April 30, 2018)
4.7	Form of Pre-Funded Warrant to Purchase Shares of Common Stock of Genocea Biosciences, Inc. (incorporated by reference to Exhibit 4.1 to the Company's Form 8-K, File No. 001-36289, filed on February 12, 2019)
4.8	Form of Class B Warrant to Purchase Shares of Common Stock of Genocea Biosciences, Inc.(incorporated by reference to Exhibit 4.8 to the Company's Annual Report on Form 10-K, File No. 001-36289, filed on February 28, 2019)
5.1	Opinion of Ropes & Gray LLP
10.1	Form of Director Indemnification Agreement (incorporated by reference to Exhibit 10.1 to the Company's Registration Statement on Form S-1, File No. 333-193043, filed on December 23, 2013)
10.2+	Amended and Restated License Agreement between Genocea Biosciences, Inc. and President and Fellows of Harvard College, dated November 19, 2012 (incorporated by reference to Exhibit 10.2 to the Company's Form 10-Q, File No.001-36289, dated November 4, 2016)
10.3+	License and Collaboration Agreement between Genocea Biosciences, Inc. and Isconova AB, dated August 5, 2009, as amended on March 19, 2010, June 18, 2010, August 17, 2010, October 19, 2011 and February 6, 2012 (incorporated by reference to Exhibit 10.3 to the Company's Form 10-Q, File No.001-36289, dated November 4, 2016)
10.4+	Exclusive License Agreement for Escherichia Coli K12 to Deliver Protein to the Macrophage Cytosol between Genocea Biosciences, Inc. and The Regents of the University of California, dated August 18, 2006 (incorporated by reference to Exhibit 10.5 to the Company's Registration Statement on Form S-1, File No. 333-193043, as amended on January 13, 2014)
10.5	Lease, dated as of July 3, 2012 between TBCI, LLC and Genocea Biosciences, Inc. (incorporated by reference to Exhibit 10.8 to the Company's Registration Statement on Form S-1, File No. 333-193043, dated December 23, 2013)
10.6	Agreement Regarding Sublease, dated as of July 9, 2012, by TBCI, LLC, FoldRx Pharmaceuticals, Inc., Pfizer Inc. and Genocea Biosciences, Inc. (incorporated by reference to Exhibit 10.9 to the Company's Registration Statement on Form S-1, File No. 333-193043, filed on December 23, 2013)
10.7†	Genocea Biosciences, Inc. Amended and Restated 2007 Equity Incentive Plan, as amended on June 24, 2013 (incorporated by reference to Exhibit 10.10 to the Company's Registration Statement on Form S-1, File No. 333-193043, filed on December 23, 2013)
10.8†	Consulting Agreement between Genocea Biosciences, Inc. and George Siber, dated May 16, 2007, as amended on June 30, 2009, December 16, 2010, June 15, 2011 and June 5, 2013 (incorporated by reference to Exhibit 10.11 to the Company's Registration Statement on Form S-1, File No. 333-193043, filed on December 23, 2013)
10.9†	Amended and Restated Employment Letter Agreement between William Clark and Genocea Biosciences, Inc., dated January 16, 2014 (incorporated by reference to Exhibit 10.12 to the Company's Registration Statement on Form S-1, File No. 333-193043, as amended on January 23, 2014)
10.10†	Letter Agreement, dated April 7, 2014, between the Company and Jonathan Poole (incorporated by referenced to Exhibit 10.1 to the Company's Current Report on Form 8-K, File No. 001-36289, filed on April 8, 2014)
10.11†	Genocea Biosciences, Inc. Amended and Restated 2014 Equity Incentive Plan (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K, File No. 001-36289, filed on June 25, 2018)

10.12†	Genocea Biosciences, Inc. Cash Incentive Plan (incorporated by reference to Exhibit 10.16 to the Company's Registration Statement on Form S-1, File No. 333-193043, as amended on January 13, 2014)
10.13†	Form of Nonstatutory Stock Option Granted under the Genocea Biosciences, Inc. Amended and Restated 2007 Equity Incentive Plan (incorporated by reference to Exhibit 10.20 to the Company's Registration Statement on Form S-1, File No. 333-193043, filed on December 23, 2013)
10.14†	Form of Incentive Stock Option Granted under the Genocea Biosciences, Inc. Amended and Restated 2007 Equity Incentive Plan (incorporated by reference to Exhibit 10.21 to the Company's Registration Statement on Form S-1, File No. 333-193043, filed on December 23, 2013)
10.15†	Form of Incentive Stock Option under the Genocea Biosciences, Inc. 2014 Equity Incentive Plan (incorporated by reference to Exhibit 10.22 to the Company's Registration Statement on Form S-1, File No. 333-193043, as amended on January 13, 2014)
10.16†	Form of Nonstatutory Stock Option under the Genocea Biosciences, Inc. 2014 Equity Incentive Plan (incorporated by reference to Exhibit 10.23 to the Company's Registration Statement on Form S-1, File No. 333-193043, as amended on January 13, 2014)
10.17†	Restricted Stock Agreement between Genocea Biosciences, Inc. and Katrine Bosley, dated November 7, 2013 (incorporated by reference to Exhibit 10.25 to the Company's Registration Statement on Form S-1, File No. 333-193043, as amended on January 13, 2014)
10.18†	Genocea Biosciences, Inc. 2014 Employee Stock Purchase Plan , as amended (incorporated by reference to Exhibit 10.2 to the Company's Current Report on Form 8-K, File No. 001-36289, filed on June 25, 2018)
10.19†	Nonstatutory Stock Option granted under the Genocea Biosciences, Inc. Amended and Restated 2007 Equity Incentive Plan to Katrine Bosley, dated May 13, 2013 (incorporated by reference to Exhibit 10.27 to the Company's Registration Statement on Form S-1, File No. 333-193043, as amended on January 13, 2014)
10.20†	Nonstatutory Stock Option granted under the Genocea Biosciences, Inc. Amended and Restated 2007 Equity Incentive Plan to Katrine Bosley, dated November 5, 2013 (incorporated by reference to Exhibit 10.28 to the Company's Registration Statement on Form S-1, File No. 333-193043, as amended on January 13, 2014)
10.21	Loan and Security Agreement between the Company and Hercules Technology Growth Capital, Inc., dated November 20, 2014 (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K, File No. 001-36289, filed on November 21, 2014)
10.22	Equity Rights Letter Agreement between the Company and Hercules Technology Growth Capital, Inc., dated November 20, 2014 (incorporated by reference to Exhibit 10.2 to the Company's Current Report on Form 8-K, File No. 001-36289, filed on November 21, 2014)
10.23†	Fifth Amendment to the Consulting Agreement between Genocea Biosciences, Inc. and George Siber, dated June 15, 2015 (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K, File No. 001-36289, filed on June 19, 2015)
10.24	Amendment No. 1 to Loan and Security Agreement between the Company and Hercules Technology Growth Capital, Inc., dated December 17, 2015 (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K File No. 001-36289, filed on December 18, 2015)
10.25	Sublease Agreement between the Company and the Smithsonian Institution, dated June 15, 2015 (incorporated by reference to Exhibit 10.2 to the Company's Current Report on Form 8-K, File No. 001-36289, filed on June 19, 2015)
10.26	First Amendment to Lease, dated May 16, 2016, between 100 Discovery Park DE, LLC, a Delaware limited liability company (as successor in interest to TBCI, LLC, as Trustee of 100 Discovery Park Realty Trust) and Genocea Biosciences, Inc. (incorporated by reference to Exhibit 10.30 to the Company's Form 10-Q, File No. 001-36289, filed on August 5, 2016)
10.27†	Sixth Amendment to the Consulting Agreement between Genocea Biosciences, Inc. and George Siber, dated June 13, 2017 (incorporated by reference to Exhibit 10.29 to the Company's Annual Report on Form 10-K, File No. 001-36289, filed on February 16, 2018)
10.28	Amendment No. 2 to the Loan and Security Agreement between the Company and Hercules Technology Growth Capital, Inc., dated January 19, 2018 (incorporated by reference to Exhibit 10.30 to the Company's Annual Report on Form 10-K, File No. 001-36289, filed on February 16, 2018)

10.29+	License and Supply Agreement, between the Company and Oncovir, Inc., dated January 26, 2018 (incorporated by reference to Exhibit 10.31 to the Company's Annual Report on Form 10-K, File No. 001-36289, filed on February 16, 2018)
10.30+	Amended and Restated Loan and Security Agreement between the Company, the several banks and other financial institutions or entities from time to time parties thereto and Hercules Capital, Inc., dated April 24, 2018 (incorporated by reference to Exhibit 10.4 to the Company's Quarterly Report on Form 10-Q, File No. 001-36289, filed on August 3, 2018)
10.31	Amendment to Equity Rights Letter Agreement between the Company, Hercules Capital, Inc. (f/k/a Hercules Technology Growth Capital, Inc.), dated April 24, 2018 (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K, File No. 001-36289, filed on April 30, 2018)
10.32	Subscription Agreement, dated February 11, 2019, among Genocea Biosciences, Inc. and the purchasers party thereto (incorporated by reference to Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q, File No. 001-36289, filed on April 30, 2019)
23.1	Consent of Ernst & Young LLP
23.2	Consent of Ropes & Gray LLP (included in Exhibit 5.1)
24.1	Power of Attorney (previously filed)

_____

† Indicates a management contract or compensatory plan.

+ Certain confidential information contained in this exhibit has been omitted because it (i) is not material and (ii) would be competitively harmful if publicly disclosed.

(b) Financial statement schedules

Schedules not listed above have been omitted because the information required to be set forth therein is not applicable or is shown in the financial statements or notes thereto.

Item 17. Undertakings

The undersigned Registrant hereby undertakes to provide to the underwriters at the closing specified in the underwriting agreement certificates in such denominations and registered in such names as required by the underwriters to permit prompt delivery to each purchaser.

Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers and controlling persons of the Registrant pursuant to the foregoing provisions, or otherwise, the Registrant has been advised that in the opinion of the SEC such indemnification is against public policy as expressed in the Securities 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.

The undersigned Registrant hereby undertakes that:

(1) For purposes of determining any liability under the Securities Act, the information omitted from the form of prospectus filed as part of this registration statement in reliance upon Rule 430A and contained in a form of prospectus filed by the Registrant pursuant to Rule 424(b)(1) or (4) or 497(h) under the Securities Act shall be deemed to be part of this registration statement as of the time it was declared effective.

(2) For the purpose of determining any liability under the Securities Act, each post-effective amendment that contains a form of prospectus 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.

Signatures

Pursuant to the requirements of the Securities Act of 1933, as amended, the Registrant has duly caused this Registration Statement on Form S-1 to be signed on its behalf by the undersigned, thereunto duly authorized, in the city of Cambridge, Commonwealth of Massachusetts, on June 18, 2019.

GENOCEA BIOSCIENCES, INC.

By: /s/ William Clark

William Clark
President and Chief Executive Officer

Pursuant to the requirements of the Securities Act of 1933, as amended, this Registration Statement on Form S-1 has been signed by the following persons in the capacities and on the dates indicated.

Signature	Title	Date
/s/ William Clark William Clark	President and Chief Executive Officer and Director (Principal Executive Officer)	June 18, 2019
/s/ Diantha Duvall Diantha Duvall	Chief Financial Officer (Principal Financial Officer and Principal Accounting Officer)	June 18, 2019
* Kenneth Bate	Director	June 18, 2019
* Ali Behbahani	Director	June 18, 2019
* Katrine Bosley	Director	June 18, 2019
* Ronald Cooper	Director	June 18, 2019
* Michael Higgins	Director	June 18, 2019
* Howard Mayer, M.D.	Director	June 18, 2019
* George Siber, M.D.	Director	June 18, 2019

*By: /s/ Diantha Duvall

Diantha Duvall
Attorney-in-Fact

Exhibit 1.1

Genocea Biosciences, Inc.

[·] Shares of Common Stock
($0.001 par value per share)

Underwriting Agreement

New York, New York
June [·], 2019

SVB Leerink LLC
Stifel, Nicolaus & Company, Incorporated
As Representatives of the several Underwriters

c/o SVB Leerink LLC
One Federal Street, 37th Floor
Boston, Massachusetts 02110

c/o Stifel, Nicolaus & Company, Incorporated
787 Seventh Avenue, 11th Floor
New York, New York 10019

Ladies and Gentlemen:

Genocea Biosciences, Inc., a corporation organized under the laws of the State of Delaware (the "***Company***"), proposes to sell to the several underwriters named in Schedule I hereto (the "***Underwriters***"), for whom you are acting as representatives (the "***Representatives***"), (i) [·] shares (the "***Firm Shares***") of common stock, $0.001 par value (the "***Common Stock***"), of the Company. The Company also proposes to grant to the Underwriters an option to purchase up to (i) [·] additional shares of Common Stock (the "***Option Shares***" and together with the Firm Shares, the "***Securities***") to be issued and sold by the Company. Certain terms used herein are defined in Section 20 hereof.

1. Representations and Warranties.

The Company represents and warrants to, and agrees with, each Underwriter as set forth below in this Section 1.

(a) The Company has prepared and filed with the Commission a registration statement (file number 333-232023) on Form S-1, including a related preliminary prospectus, for registration under the Act of the offering and sale of the Securities. Such Registration Statement, including any amendments thereto filed prior to the Execution Time, has become effective. The Company has filed one or more amendments thereto, including a related preliminary prospectus, each of which has previously been furnished to you. The Company will file with the Commission a final prospectus

in accordance with Rule 424(b). As filed, such final prospectus shall contain all information required by the Act and the rules thereunder and, except to the extent the Representatives shall agree in writing to a modification, shall be in all substantive respects in the form furnished to you prior to the Execution Time or, to the extent not completed at the Execution Time, shall contain only such specific additional information and other changes (beyond that contained in the latest Preliminary Prospectus) as the Company has advised you, prior to the Execution Time, will be included or made therein. The Company meets the requirements necessary to incorporate its Exchange Act reports by reference into the Registration Statement pursuant to General Instruction VII to Form S-1 under the Act.

(b) On the Effective Date, the Registration Statement did, and when the Prospectus is filed in accordance with Rule 424(b) and on the Closing Date (as defined herein) and on any date on which Option Shares are purchased, if such date is not the Closing Date (a "***settlement date***"), the Prospectus (and any supplement thereto) will, comply in all material respects with the applicable requirements of the Act and the rules thereunder; on the Effective Date and at the Execution Time, the Registration Statement did not and will not contain any untrue statement of a material fact or omit to state any material fact required to be stated therein or necessary in order to make the statements therein not misleading; and on the date of any filing pursuant to Rule 424(b) and on the Closing Date and any settlement date, the Prospectus (together with any supplement thereto) will not include any untrue statement of a material fact or omit to state a material fact necessary in order to make the statements therein, in the light of the circumstances under which they were made, not misleading; provided, however, that the Company makes no representations or warranties as to the information contained in or omitted from the Registration Statement, or the Prospectus (or any supplement thereto) in reliance upon and in conformity with information furnished in writing to the Company by or on behalf of any Underwriter through the Representatives specifically for inclusion in the Registration Statement or the Prospectus (or any supplement thereto), it being understood and agreed that the only such information furnished by or on behalf of any Underwriter consists of the information described as such in Section 8 hereof.

(c) (i) The Disclosure Package and the price to the public, and the number of Shares to be included on the cover page of the Prospectus, when taken together as a whole, (ii) each electronic road show when taken together as a whole with the Disclosure Package and the price to the public, and the number of Shares to be included on the cover page of the Prospectus, and (iii) any individual Written Testing-the-Waters Communication, when taken together as a whole with the Disclosure Package and the price to the public, and the number of Shares to be included on the cover page of the Prospectus, does not contain any untrue statement of a material fact or omit to state any material fact necessary in order to make the statements therein, in the light of the circumstances under which they were made, not misleading. The preceding sentence does not apply to statements in or omissions from the Disclosure Package based upon and in conformity with written information furnished to the Company by or on behalf of any Underwriter through the Representatives specifically for use therein, it being understood and agreed that the only such information furnished by or on behalf of any Underwriter consists of the information described as such in Section 8 hereof.

(d) The documents incorporated by reference in the Registration Statement, the Prospectus and the Disclosure Package, when they were filed with the Commission, complied in

all material respects with the requirements of the Exchange Act; and any further documents so filed and incorporated by reference in the Registration Statement, the Prospectus or the Disclosure Package, when such documents are filed with the Commission, will comply in all material respects with the requirements of the Exchange Act.

(e) (i) At the time of filing the Registration Statement and (ii) as of the Execution Time (with such date being used as the determination date for purposes of this clause (ii)), the Company was not and is not an Ineligible Issuer (as defined in Rule 405), without taking account of any determination by the Commission pursuant to Rule 405 that it is not necessary that the Company be considered an Ineligible Issuer.

(f) From the time of initial filing of the Registration Statement with the Commission (or, if earlier, the first date on which the Company engaged directly or through any person authorized to act on its behalf in any Testing-the-Waters Communication (as defined below)) through the Execution Time, the Company has been and is an "emerging growth company," as defined in Section 2(a) of the Act (an "***Emerging Growth Company***").

(g) The Company (i) has not alone engaged in any Testing-the-Waters Communication other than Testing the Waters Communications with the consent of the Representatives with entities that are qualified institutional buyers within the meaning of Rule 144A under the Act or institutions that are accredited investors within the meaning of Rule 501 under the Act and (ii) has not authorized anyone other than the Representatives to engage in Testing-the-Waters Communications. The Company reconfirms that the Representatives have been authorized to act on its behalf in undertaking Testing-the-Waters Communications. The Company has not distributed any Written Testing-the-Waters Communications. "***Testing-the-Waters Communication***" means any oral or written communication with potential investors undertaken in reliance on Section 5(d) of the Act. "***Written Testing-the-Waters Communication***" means any Testing-the-Waters Communication that is a written communication within the meaning of Rule 405 under the Act.

(h) Each Issuer Free Writing Prospectus does not include any information that conflicts with the information contained in the Registration Statement, including any document incorporated by reference therein that has not been superseded or modified. The foregoing sentence does not apply to statements in or omissions from any Issuer Free Writing Prospectus based upon and in conformity with written information furnished to the Company by or on behalf of any Underwriter through the Representatives specifically for use therein, it being understood and agreed that the only such information furnished by or on behalf of any Underwriter consists of the information described as such in Section 8 hereof.

(i) The Company has been duly incorporated and is validly existing as a corporation in good standing under the laws of the jurisdiction in which it is chartered or organized with full corporate power and authority to own or lease, as the case may be, and to operate its properties and conduct its business as described in the Disclosure Package and the Prospectus, and to execute and deliver this Agreement. The Company is duly qualified to do business as a foreign corporation and is in good standing under the laws of each jurisdiction which requires such qualification. The Company has no subsidiaries.

(j) The Company's authorized equity capitalization is as set forth in the Disclosure Package and the Prospectus; the capital stock of the Company conforms to the description thereof contained in the Disclosure Package and the Prospectus; the outstanding shares of Common Stock have been duly and validly authorized and issued and are fully paid and nonassessable; the Securities have been duly and validly authorized and, when issued and delivered to and paid for by the Underwriters pursuant to this Agreement, will be fully paid and nonassessable; the certificates for the Securities are in valid form; the holders of outstanding shares of capital stock of the Company are not entitled to preemptive or other rights to subscribe for the Securities, except for any such rights as have been effectively waived or complied with; and, except as set forth in the Disclosure Package and the Prospectus, no options, warrants or other rights to purchase, agreements or other obligations to issue, or rights to convert any obligations into or exchange any securities for, shares of capital stock of or ownership interests in the Company are outstanding.

(k) There is no franchise, contract or other document of a character required to be described in the Registration Statement or Prospectus, or to be filed as an exhibit thereto or to any document incorporated by reference therein, which is not described or filed as required (and the Preliminary Prospectus contains in all material respects the same description of the foregoing matters contained in the Prospectus); and the statements in the Preliminary Prospectus and the Prospectus (including by means of incorporation by reference therein) under the headings "Risk Factors – Risks Related to Our Intellectual Property," "Business – Intellectual Property," "Business – Government Regulation," "Business – Legal Proceedings," "Description of Common Stock," and "Material United States Federal Income and Estate Tax Considerations for Non-U.S. Holders of Shares of our Common Stock," insofar as such statements summarize legal matters, agreements, documents or proceedings discussed therein, are accurate and fair summaries of such legal matters, agreements, documents or proceedings.

(l) This Agreement has been duly authorized, executed and delivered by the Company.

(m) The Company is not and, after giving effect to the offering and sale of the Securities and the application of the proceeds thereof as described in the Disclosure Package and the Prospectus, will not be an "investment company" as defined in the Investment Company Act of 1940, as amended.

(n) No consent, approval, authorization, filing with or order of any court or governmental agency or body is required in connection with the transactions contemplated herein, except such as have been obtained under the Act and such as may be required under the blue sky laws of any jurisdiction in connection with the purchase and distribution of the Securities by the Underwriters in the manner contemplated herein and in the Disclosure Package and the Prospectus.

(o) Neither the issue and sale of the Securities, nor the consummation of any other of the transactions herein contemplated nor the fulfillment of the terms hereof, will conflict with, result in a breach or violation of, or imposition of any lien, charge or encumbrance upon any property or assets of the Company pursuant to, (i) the charter or by-laws of the Company, (ii) the terms of any indenture, contract, lease, mortgage, deed of trust, note agreement, loan agreement or other agreement, obligation, condition, covenant or instrument to which the Company is a party or

bound or to which its property is subject, or (iii) any statute, law, rule, regulation, judgment, order or decree applicable to the Company of any court, regulatory body, administrative agency, governmental body, arbitrator or other authority having jurisdiction over the Company or any of its properties.

(p) No holders of securities of the Company have rights to the registration of such securities under the Registration Statement except for any such rights as have been effectively waived.

(q) The historical financial statements of the Company included in the Preliminary Prospectus, the Prospectus and the Registration Statement present fairly the financial condition, results of operations and cash flows of the Company as of the dates and for the periods indicated, comply as to form with the applicable accounting requirements of the Act and have been prepared in conformity with generally accepted accounting principles applied on a consistent basis throughout the periods involved (except as otherwise noted therein). The selected financial data set forth under the caption "Selected Financial Data" in the Registration Statement, the Preliminary Prospectus and the Prospectus fairly present, on the basis stated therein, the information included therein.

(r) No action, suit or proceeding by or before any court or governmental agency, authority or body or any arbitrator involving the Company or its property is pending or, to the knowledge of the Company, threatened that is likely to have a Material Adverse Effect, whether or not arising from transactions in the ordinary course of business, except as set forth in or contemplated in the Disclosure Package and the Prospectus (exclusive of any supplement thereto).

(s) The Company owns or leases all such properties as are necessary to the conduct of its operations as presently conducted in all material respects.

(t) The Company is not in violation or default of (i) any provision of its charter or bylaws, (ii) the terms of any indenture, contract, lease, mortgage, deed of trust, note agreement, loan agreement or other agreement, obligation, condition, covenant or instrument to which it is a party or bound or to which its property is subject, or (iii) any statute, law, rule, regulation, judgment, order or decree of any court, regulatory body, administrative agency, governmental body, arbitrator or other authority having jurisdiction over the Company or any of its properties, as applicable, except in the case of clauses (ii) and (iii), as would not reasonably be expected to have a Material Adverse Effect.

(u) Ernst & Young LLP, who have certified certain financial statements of the Company and delivered their report with respect to the audited financial statements included in the Disclosure Package and the Prospectus, are independent public accountants with respect to the Company within the meaning of the Act and the applicable published rules and regulations thereunder.

(v) There are no transfer taxes or other similar fees or charges under Federal law or the laws of any state, or any political subdivision thereof, required to be paid in connection with

the execution and delivery of this Agreement, or the issuance by the Company or sale by the Company of the Securities.

(w) The Company has filed all tax returns that are required to be filed or has requested extensions thereof (except in any case in which the failure so to file would not have a Material Adverse Effect, whether or not arising from transactions in the ordinary course of business, except as set forth in or contemplated in the Disclosure Package and the Prospectus (exclusive of any supplement thereto)) and has paid all taxes required to be paid by it and any other assessment, fine or penalty levied against it, to the extent that any of the foregoing is due and payable, except for any such assessment, fine or penalty that is currently being contested in good faith or as would not have a Material Adverse Effect, whether or not arising from transactions in the ordinary course of business, except as set forth in or contemplated in the Disclosure Package and the Prospectus (exclusive of any supplement thereto).

(x) No labor problem or dispute with the employees of the Company exists or, to the knowledge of the Company, is threatened or imminent, and the Company is not aware of any existing or imminent labor disturbance by the employees of any of its principal suppliers, contractors or customers, that could have a Material Adverse Effect, whether or not arising from transactions in the ordinary course of business, except as set forth in or contemplated in the Disclosure Package and the Prospectus (exclusive of any supplement thereto).

(y) The Company is insured by insurers of recognized financial responsibility against such losses and risks and in such amounts as the Company reasonably believes are prudent and customary in the businesses in which it is engaged; all policies of insurance and fidelity or surety bonds insuring the Company or its business, assets, employees, officers and directors are in full force and effect; the Company is in compliance with the terms of such policies and instruments in all material respects; and there are no claims by the Company under any such policy or instrument as to which any insurance company is denying liability or defending under a reservation of rights clause; the Company has not been refused any insurance coverage sought or applied for; and the Company has no reason to believe that it will not be able to renew its existing insurance coverage as and when such coverage expires or to obtain similar coverage from similar insurers as may be necessary to continue its business at a cost that would not have a Material Adverse Effect, whether or not arising in the ordinary course of business, except as set forth in or contemplated in the Disclosure Package and the Prospectus (exclusive of any supplement thereto).

(z) The Company possesses all licenses, certificates, permits and other authorizations issued by all applicable authorities necessary to conduct its business, and the Company has not received any notice of proceedings relating to the revocation or modification of any such certificate, authorization or permit which, singly or in the aggregate, if the subject of an unfavorable decision, ruling or finding, would have a Material Adverse Effect, except as set forth in or contemplated in the Disclosure Package and the Prospectus (exclusive of any supplement thereto).

(aa) Except as described in the Registration Statement, the Disclosure Package and the Prospectus, and except as would not, individually or in the aggregate, result in a Material Adverse Effect: (i) the Company is and has been in compliance with statutes, laws, ordinances, rules and

regulations applicable to the Company for the ownership, testing, development, manufacture, packaging, processing, use, labeling, storage, or disposal of any product manufactured by or on behalf of the Company or out-licensed by the Company, including without limitation, the Federal Food, Drug, and Cosmetic Act, 21 U.S.C. § 301, et seq., the Public Health Service Act, 42 U.S.C. § 262, similar laws of other Governmental Entities and the regulations promulgated pursuant to such laws (collectively, "***Applicable Laws***"); (ii) the Company possess all licenses, certificates, approvals, authorizations, permits and supplements or amendments thereto required by any such Applicable Laws and/or for the ownership of its properties or the conduct of its business as described in the Registration Statement, the Disclosure Package and the Prospectus (collectively, "***Authorizations***") and such Authorizations are valid and in full force and effect and the Company is not in violation of any term of any such Authorizations; (iii) the Company has not received any written notice of adverse finding, warning letter or other written correspondence or notice from the U.S. Food and Drug Administration ("***FDA***") or any other Governmental Entity alleging or asserting noncompliance with any Applicable Laws or Authorizations; (iv) the Company has not received notice of any ongoing claim, action, suit, proceeding, hearing, enforcement, investigation, arbitration or other action from any Governmental Entity or third party alleging that any product, operation or activity is in violation of any Applicable Laws or Authorizations or has any knowledge that any such Governmental Entity or third party is considering any such claim, litigation, arbitration, action, suit, investigation or proceeding, nor, to the best of the Company's knowledge, has there been any noncompliance with or violation of any Applicable Laws by the Company that could reasonably be expected to require the issuance of any such written notice or result in an investigation, corrective action, or enforcement action by FDA or similar Governmental Entity; (v) the Company has not received notice that any Governmental Entity has taken, is taking or intends to take action to limit, suspend, modify or revoke any Authorizations or has any knowledge that any such Governmental Entity has threatened or is considering such action; and (vi) the Company has filed, obtained, maintained or submitted all reports, documents, forms, notices, applications, records, claims, submissions and supplements or amendments as required by any Applicable Laws or Authorizations and that all such reports, documents, forms, notices, applications, records, claims, submissions and supplements or amendments were complete, correct and not misleading on the date filed (or were corrected or supplemented by a subsequent submission). To the Company's knowledge, neither the Company, nor any of its directors, officers, employees or agents, has made, or caused the making of, any false statements on, or material omissions from, any other records or documentation prepared or maintained to comply with the requirements of the FDA or any other Governmental Entity.

(bb) The pre-clinical and clinical studies and tests conducted by the Company has been and, if still pending, are being conducted in all material respects pursuant to all Applicable Laws and Authorizations; the descriptions of the results of such pre-clinical and clinical studies and tests contained in the Registration Statement, the Disclosure Package and the Prospectus are accurate and complete in all material respects and fairly present the data derived from such clinical studies and tests; except to the extent disclosed in the Registration Statement, the Disclosure Package and the Prospectus, the Company is not aware of any clinical studies or tests, the results of which the Company believes reasonably call into question the research, nonclinical or clinical study or test results described or referred to in the Registration Statement, the Disclosure Package and the Prospectus when viewed in the context in which such results are described; and the Company has

not received any written notices or correspondence from any Governmental Entity requiring the termination, suspension or material modification of any clinical study or test conducted by or on behalf of the Company.

(cc) The Company owns, possesses, licenses or otherwise has sufficient rights to use, on reasonable terms, all patents, patent applications, trade and service marks, trade and service mark registrations, trade names, copyrights, licenses, inventions, trade secrets, technology, know-how and other intellectual property (collectively, the "***Intellectual Property***") necessary for the conduct of the Company's business as now conducted or as proposed in the Prospectus to be conducted. Except as set forth in the Preliminary Prospectus and the Prospectus under the caption "Business – Intellectual Property," (a) there are no rights of third parties to any material Intellectual Property; (b) there is no material infringement by third parties of any such Intellectual Property; (c) there is no pending or, to the knowledge of the Company, threatened action, suit, proceeding or claim by others challenging the Company's rights in or to any such Intellectual Property, and the Company is unaware of any facts which would form a reasonable basis for any such claim; (d) there is no pending or, to the knowledge of the Company, threatened action, suit, proceeding or claim by others challenging the validity or scope of any such Intellectual Property, and the Company is unaware of any facts which would form a reasonable basis for any such claim; (e) there is no pending or, to the knowledge of the Company, threatened action, suit, proceeding or claim by others that the Company infringes or otherwise violates any patent, trademark, copyright, trade secret or other proprietary rights of others, and the Company is unaware of any act which would form a reasonable basis for any such claim; (f) to the knowledge of the Company, there is no U.S. patent which contains claims that dominate or may dominate any Intellectual Property described in the Disclosure Package and the Prospectus as being owned by or licensed to the Company or that interferes with the issued claims of any such Intellectual Property; and (g) there is no prior art of which the Company is aware that may render any U.S. patent held by the Company invalid or any U.S. patent application held by the Company unpatentable which has not been disclosed to the U.S. Patent and Trademark Office.

(dd) The statements contained in the Preliminary Prospectus and the Prospectus under the captions "Risk Factors – Risks Related to Our Intellectual Property" and "Business – Intellectual Property," insofar as such statements summarize legal matters, agreements, documents, or proceedings discussed therein, are accurate and fair summaries of such legal matters, agreements, documents or proceedings.

(ee) The Company (i) does not have any material lending or other relationship with any bank or lending affiliate of the Underwriters and (ii) does not intend to use any of the proceeds from the sale of the Securities hereunder to repay any outstanding debt owed to any affiliate of the Underwriters.

(ff) The Company maintains a system of internal accounting controls sufficient to provide reasonable assurance that (i) transactions are executed in accordance with management's general or specific authorizations; (ii) transactions are recorded as necessary to permit preparation of financial statements in conformity with generally accepted accounting principles and to maintain asset accountability; (iii) access to assets is permitted only in accordance with management's general or specific authorization; and (iv) the recorded accountability for assets is compared with the existing

assets at reasonable intervals and appropriate action is taken with respect to any differences. The Company's internal controls over financial reporting are effective and the Company is not aware of any material weakness in its internal controls over financial reporting.

(gg) The Company maintains "disclosure controls and procedures" (as such term is defined in Rule 13a-15(e) under the Exchange Act); such disclosure controls and procedures are effective.

(hh) The Company has not taken, directly or indirectly, without giving effect to activities by the Underwriters, any action designed to or that would constitute or that might reasonably be expected to cause or result in, under the Exchange Act or otherwise, stabilization or manipulation of the price of any security of the Company to facilitate the sale or resale of the Securities.

(ii) The Company is (i) in compliance with any and all applicable foreign, federal, state and local laws and regulations relating to the protection of human health and safety, the environment or hazardous or toxic substances or wastes, pollutants or contaminants ("***Environmental Laws***"), (ii) have received and are in compliance with all permits, licenses or other approvals required of them under applicable Environmental Laws to conduct their respective businesses and (iii) have not received notice of any actual or potential liability under any environmental law, except where such non-compliance with Environmental Laws, failure to receive required permits, licenses or other approvals, or liability would not, individually or in the aggregate, have a Material Adverse Effect, whether or not arising from transactions in the ordinary course of business, except as set forth in or contemplated in the Disclosure Package and the Prospectus (exclusive of any supplement thereto). Except as set forth in the Disclosure Package and the Prospectus, the Company has not been named as a "potentially responsible party" under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended.

(jj) In the ordinary course of its business, the Company periodically reviews the effect of Environmental Laws on the business, operations and properties of the Company, in the course of which it identifies and evaluates associated costs and liabilities (including, without limitation, any capital or operating expenditures required for clean-up, closure of properties or compliance with Environmental Laws, or any permit, license or approval, any related constraints on operating activities and any potential liabilities to third parties). On the basis of such review, the Company has reasonably concluded that such associated costs and liabilities would not, singly or in the aggregate, have a Material Adverse Effect, whether or not arising from transactions in the ordinary course of business, except as set forth in or contemplated in the Disclosure Package and the Prospectus (exclusive of any supplement thereto).

(kk) None of the following events has occurred or exists: (i) a failure to fulfill the obligations, if any, under the minimum funding standards of Section 302 of the United States Employee Retirement Income Security Act of 1974, as amended ("***ERISA***"), and the regulations and published interpretations thereunder with respect to a Plan that is required to be funded, determined without regard to any waiver of such obligations or extension of any amortization period; (ii) an audit or investigation by the Internal Revenue Service, the U.S. Department of Labor, the Pension Benefit Guaranty Corporation or any other federal or state governmental agency or any

foreign regulatory agency with respect to the employment or compensation of employees by any of the Company that would reasonably be expected to have a Material Adverse Effect; (iii) any breach of any contractual obligation, or any violation of law or applicable qualification standards, with respect to the employment or compensation of employees by the Company that could have a Material Adverse Effect; or (iv) a non-exempt prohibited transaction, within the meaning of Section 406 of ERISA or Section 4975 of the Code with respect to any Plan that could have a Material Adverse Effect. None of the following events has occurred or is reasonably likely to occur: (i) a material increase in the aggregate amount of contributions required to be made to all Plans in the current fiscal year of the Company compared to the amount of such contributions made in the most recently completed fiscal year of the Company; (ii) a material increase in the "accumulated post-retirement benefit obligations" (within the meaning of Statement of Financial Accounting Standards 106) of the Company as compared to the amount of such obligations in the most recently completed fiscal year of the Company; (iii) any event or condition giving rise to a liability under Title IV of ERISA that would reasonably be expected to have a Material Adverse Effect; or (iv) the filing of a claim by one or more employees or former employees of the Company related to their employment that would reasonably be expected to have a Material Adverse Effect. For purposes of this paragraph, the term "Plan" means a plan (within the meaning of Section 3(3) of ERISA) subject to Title IV of ERISA with respect to which the Company may have any liability.

(ll) There is and has been no failure on the part of the Company and any of the Company's directors or officers, in their capacities as such, to comply with any provision of the Sarbanes-Oxley Act of 2002, as amended, and the rules and regulations promulgated in connection therewith (the "***Sarbanes-Oxley Act***"), including Section 402 relating to loans.

(mm) Neither the Company nor, to the knowledge of the Company, any director, officer, agent, employee or affiliate of the Company is aware of or has taken any action, directly or indirectly, that would result in a violation by such persons of the Foreign Corrupt Practices Act of 1977, as amended, and the rules and regulations thereunder (the "***FCPA***"), including, without limitation, making use of the mails or any means or instrumentality of interstate commerce corruptly in furtherance of an offer, payment, promise to pay or authorization of the payment of any money, or other property, gift, promise to give, or authorization of the giving of anything of value to any "foreign official" (as such term is defined in the FCPA) or any foreign political party or official thereof or any candidate for foreign political office, in contravention of the FCPA; and the Company, and, to the knowledge of the Company, its affiliates have conducted their businesses in compliance with the FCPA and have instituted and maintain policies and procedures designed to ensure, and which are reasonably expected to continue to ensure, continued compliance therewith.

(nn) The operations of the Company are and have been conducted at all times in compliance with applicable financial recordkeeping and reporting requirements and the money laundering statutes and the rules and regulations thereunder and any related or similar rules, regulations or guidelines, issued, administered or enforced by any governmental agency (collectively, the "***Money Laundering Laws***") and no action, suit or proceeding by or before any court or governmental agency, authority or body or any arbitrator involving the Company with respect to the Money Laundering Laws is pending or, to the knowledge of the Company, threatened.

(oo) Neither the Company nor, to the knowledge of the Company, any director, officer, agent, employee or affiliate of the Company (i) is currently subject to any sanctions administered or imposed by the United States (including any administered or enforced by the Office of Foreign Assets Control of the U.S. Treasury Department ("***OFAC***")) or (ii) will, directly or indirectly, use the proceeds of this offering, or lend, contribute or otherwise make available such proceeds to any subsidiary, joint venture partner or other person in any manner that will result in a violation of any economic sanctions imposed by the United States (including any administered or enforced by OFAC, the U.S. Department of State, or the Bureau of Industry and Security of the U.S. Department of Commerce), the United Nations Security Council, the European Union, or the United Kingdom (including sanctions administered or controlled by Her Majesty's Treasury) (collectively, "***Sanctions***" and such persons, "***Sanction Persons***") by, or could result in the imposition of Sanctions against, any person (including any person participating in the offering, whether as underwriter, advisor, investor or otherwise).

(pp) Neither the Company nor, to the knowledge of the Company, any director, officer, agent, employee or affiliate of the Company, is a person that is, or is 50% or more owned or otherwise controlled by a person that is: (i) the subject of any Sanctions; or (ii) located, organized or resident in a country or territory that is, or whose government is, the subject of Sanctions that broadly prohibit dealings with that country or territory (currently, Cuba, Iran, North Korea, Syria and the Crimea Region of the Ukraine) (collectively, "***Sanctioned Countries***" and each, a "***Sanctioned Country***").

(qq) The Company has not engaged in any dealings or transactions with or for the benefit of a Sanctioned Person, or with or in a Sanctioned Country, in the preceding 3 years, nor does the Company have any plans to increase its dealings or transactions with Sanctioned Persons, or with or in Sanctioned Countries.

(rr) The Common Stock is registered pursuant to Section 12(b) of the Exchange Act and is listed on the Nasdaq Capital Market. The Company has taken no action designed to, or likely to have the effect of, terminating the registration of the Common Stock under the Exchange Act or delisting the Common Stock from the Nasdaq Capital Market, nor has the Company received any notification that the Commission or the Nasdaq Capital Market is contemplating terminating such registration or listing, except as set forth in the Prospectus. Except as set forth in the Prospectus, to the Company's knowledge, it is in compliance with all applicable listing requirements of the Nasdaq Capital Market.

(ss) Each forward-looking statement (within the meaning of Section 27A of the Act or Section 21E of the Exchange Act) contained in the Registration Statement, the Disclosure Package and the Prospectus was so made or reaffirmed by the Company in good faith and with reasonable basis.

(tt) None of the Company's product candidates have received marketing approval from any Regulatory Authority.

(uu) (A) To the Company's knowledge, there has been no security breach or other compromise of or relating to the Company's information technology and computer systems,

networks, hardware, software, data and databases (including the data and information of its customers, employees, suppliers, vendors and any third party data maintained, processed or stored by the Company, and any such data processed or stored by third parties on behalf of the Company) (collectively, "***IT Systems and Data***"); (B) the Company has not been notified of, and has no knowledge of any event or condition that would reasonably be expected to result in, any security breach or incident, unauthorized access or disclosure, or other compromise of its IT Systems and Data; and (C) the Company has implemented controls, policies, procedures, and technological safeguards to maintain and protect the integrity, continuous operation, redundancy and security of its IT Systems and Data reasonably consistent with industry standards and practices, or as required by applicable regulatory standards. The Company is presently in compliance in all material respects with all applicable laws or statutes and all applicable judgments, orders, rules and regulations of any court or arbitrator or governmental or regulatory authority, internal policies and contractual obligations relating to the privacy and security of IT Systems and Data and to the protection of such IT Systems and Data from unauthorized use, access, misappropriation or modification.

(vv) The Company is, and at all prior times was, in material compliance with all applicable state and federal data privacy and security laws and regulations, including without limitation HIPAA, and the Company has taken any required and necessary actions to prepare to comply in all material respects with, and since May 25, 2018, have been and currently are in material compliance with, the European Union General Data Protection Regulation ("***GDPR***") (EU 2016/679) (collectively, the "***Privacy Laws***"). To ensure material compliance with the Privacy Laws, the Company has in place, comply with, and take appropriate steps reasonably designed to ensure compliance in all material respects with their policies and procedures relating to data privacy and security and the collection, storage, use, disclosure, handling, and analysis of Personal Data (the "***Policies***"). The Company has at all times made all disclosures to users or customers required by applicable laws and regulatory rules or requirements, except where the failure to do so would not, individually or in the aggregate, have a Material Adverse Effect. None of such disclosures made or contained in any Policy have, to the knowledge of the Company, been inaccurate or in violation of any applicable laws and regulatory rules or requirements in any material respect. The Company further certifies that it: (i) has not received notice of any actual or potential liability under or relating to, or actual or potential violation of, any of the Privacy Laws, and has no knowledge of any event or condition that would reasonably be expected to result in any such notice; (ii) is not currently conducting or paying for, in whole or in part, any investigation, remediation, or other corrective action pursuant to any Privacy Law; or (iii) is not a party to any order, decree, or agreement that imposes any obligation or liability under any Privacy Law.

(ww) The interactive data in eXtensible Business Reporting Language included in the Registration Statement fairly presents the information called for in all material respects and has been prepared in accordance with the Commission's rules and guidelines applicable thereto.

Any certificate signed by any officer of the Company and delivered to the Representatives or counsel for the Underwriters in connection with the offering of the Securities shall be deemed a representation and warranty by the Company, as to matters covered thereby, to each Underwriter.

2. Purchase and Sale.

(a) Subject to the terms and conditions and in reliance upon the representations and warranties herein set forth, the Company agrees to sell to each Underwriter, and each Underwriter agrees, severally and not jointly, to purchase from the Company, the respective number of Firm Shares as set forth opposite such Underwriters' name on Schedule I hereto. The purchase price to be paid to the Company by the Underwriters for each Firm Share shall be $[·].

(b) Subject to the terms and conditions and in reliance upon the representations and warranties herein set forth, the Company hereby grants an option to the several Underwriters to purchase, severally and not jointly, up to [·] Option Shares at the same purchase price per share as the Underwriters shall pay for the Firm Shares, less an amount per share equal to any dividends or distributions declared by the Issuer and payable on the Firms Shares but not payable on the Option Shares. Such option may be exercised in whole or in part at any time on or before the 30th day after the date of the Prospectus upon written or telegraphic notice by the Representatives to the Company setting forth the number of Option Shares as to which the several Underwriters are exercising the option and the settlement date. The number of Option Shares to be purchased by each Underwriter shall be the same percentage of the total number of Option Shares to be purchased by the several Underwriters as such Underwriter is purchasing of the Firm Shares, subject to such adjustments as you in your absolute discretion shall make to eliminate any fractional shares.

3. Delivery and Payment. Delivery of and payment for the Firm Shares and and the Option Shares (if such option provided for in Section 2(b) hereof shall have been exercised on or before one Business Day immediately preceding the Closing Date) shall be made at 10:00 A.M., New York City time on June [·], 2019, or at such time on such later date not more than three Business Days after the foregoing date as the Representatives shall designate, which date and time may be postponed by agreement among the Representatives and the Company or as provided in Section 9 hereof (such date and time of delivery and payment for the Securities being herein called the "***Closing Date***"). Delivery of the Securities shall be made to the Representatives for the respective accounts of the several Underwriters against payment by the several Underwriters through the Representatives of the purchase price thereof to or upon the order of the Company by wire transfer payable in same-day funds to the accounts specified by the Company. Delivery of the book-entry positions for the Securities shall be made through the facilities of The Depository Trust Company unless the Representatives shall otherwise instruct.

4. Offering by Underwriters. It is understood that the several Underwriters propose to offer the Securities for sale to the public as set forth in the Prospectus.

5. Agreements.

(i) The Company agrees with the several Underwriters that:

(a) Prior to the termination of the offering of the Securities, the Company will not file any amendment of the Registration Statement or supplement to the Prospectus or any Rule 462(b) Registration Statement unless the Company has furnished you a copy for your review prior to filing and will not file any such proposed amendment or supplement to which you reasonably object. The

Company will cause the Prospectus, properly completed, and any supplement thereto to be filed in a form approved by the Representatives with the Commission pursuant to the applicable paragraph of Rule 424(b) within the time period prescribed and will provide evidence satisfactory to the Representatives of such timely filing. The Company will promptly advise the Representatives (i) when the Prospectus, and any supplement thereto, shall have been filed (if required) with the Commission pursuant to Rule 424(b) or when any Rule 462(b) Registration Statement shall have been filed with the Commission, (ii) when, prior to termination of the offering of the Securities, any amendment to the Registration Statement shall have been filed or become effective, (iii) of any request by the Commission or its staff for any amendment of the Registration Statement, or any Rule 462(b) Registration Statement, or for any supplement to the Prospectus or for any additional information, (iv) of the issuance by the Commission of any stop order suspending the effectiveness of the Registration Statement or of any notice objecting to its use or the institution or threatening of any proceeding for that purpose and (v) of the receipt by the Company of any notification with respect to the suspension of the qualification of the Securities for sale in any jurisdiction or the institution or threatening of any proceeding for such purpose. The Company will use its best efforts to prevent the issuance of any such stop order or the occurrence of any such suspension or objection to the use of the Registration Statement and, upon such issuance, occurrence or notice of objection, to obtain as soon as possible the withdrawal of such stop order or relief from such occurrence or objection, including, if necessary, by filing an amendment to the Registration Statement or a new registration statement and using its best efforts to have such amendment or new registration statement declared effective as soon as practicable.

(b) If, at any time prior to the filing of the Prospectus pursuant to Rule 424(b), any event occurs as a result of which the Disclosure Package would include any untrue statement of a material fact or omit to state any material fact necessary to make the statements therein in the light of the circumstances under which they were made at such time not misleading, the Company will (i) notify promptly the Representatives so that any use of the Disclosure Package may cease until it is amended or supplemented; (ii) amend or supplement the Disclosure Package to correct such statement or omission; and (iii) supply any amendment or supplement to you in such quantities as you may reasonably request.

(c) If, at any time when a prospectus relating to the Securities is required to be delivered under the Act (including in circumstances where such requirement may be satisfied pursuant to Rule 172), any event occurs as a result of which the Prospectus as then supplemented would include any untrue statement of a material fact or omit to state any material fact necessary to make the statements therein in the light of the circumstances under which they were made or the circumstances then prevailing not misleading, or if it shall be necessary to amend the Registration Statement or supplement the Prospectus to comply with the Act or the rules thereunder, the Company promptly will (i) notify the Representatives of any such event; (ii) prepare and file with the Commission, subject to the second sentence of paragraph (a) of this Section 5, an amendment or supplement which will correct such statement or omission or effect such compliance; and (iii) supply any supplemented Prospectus to you in such quantities as you may reasonably request.

(d) As soon as practicable, the Company will make generally available to its security holders and to the Representatives an earnings statement or statements of the Company which will satisfy the provisions of Section 11(a) of the Act and Rule 158.

(e) The Company will furnish to the Representatives and counsel for the Underwriters, without charge, signed copies of the Registration Statement (including exhibits thereto) and to each other Underwriter a copy of the Registration Statement (without exhibits thereto) and, so long as delivery of a prospectus by an Underwriter or dealer may be required by the Act (including in circumstances where such requirement may be satisfied pursuant to Rule 172), as many copies of each Preliminary Prospectus, the Prospectus and each Issuer Free Writing Prospectus and any supplement thereto as the Representatives may reasonably request. The Company will pay the expenses of printing or other production of all documents relating to the offering.

(f) The Company will arrange, if necessary, for the qualification of the Securities for sale under the laws of such jurisdictions as the Representatives may designate and will maintain such qualifications in effect so long as required for the distribution of the Securities; provided that in no event shall the Company be obligated to qualify to do business in any jurisdiction where it is not now so qualified or to take any action that would subject it to service of process in suits, other than those arising out of the offering or sale of the Securities, in any jurisdiction where it is not now so subject.

(g) The Company will not, without the prior written consent of the Representatives, offer, sell, contract to sell, pledge, or otherwise dispose of, (or enter into any transaction which is designed to, or might reasonably be expected to, result in the disposition (whether by actual disposition or effective economic disposition due to cash settlement or otherwise) by the Company or any affiliate of the Company (except as permitted by the lock-up letter described in Section 6(k) hereof)) directly or indirectly, including the filing (or participation in the filing) of a registration statement with the Commission in respect of, or establish or increase a put equivalent position or liquidate or decrease a call equivalent position within the meaning of Section 16 of the Exchange Act, any other shares of Common Stock or any securities convertible into, or exercisable, or exchangeable for, shares of Common Stock (including, without limitation, pursuant to the Sales Agreement); or publicly announce an intention to effect any such transaction, for a period of 90 days after the date of the Underwriting Agreement, provided, however, that the Company may (i) issue and sell Common Stock pursuant to any employee stock option plan, stock ownership plan or dividend reinvestment plan of the Company in effect at the Execution Time; (ii) the Company may issue Common Stock issuable upon the conversion of securities or the exercise of warrants outstanding at the Execution Time; (iii) the Company may file one or more registration statements on Form S-8; and (iv) the Company may issue shares of Common Stock or securities convertible into Common Stock representing in the aggregate no more than 5% of the Company's issued and outstanding shares of Common Stock following the Closing Date to one or more counterparties in connection with the consummation of a credit facility, strategic partnership, joint venture, collaboration or the acquisition or license of any business products or intellectual property, provided, however, that the recipients of any such securities agree to be bound by a lock-up agreement in substantially the form of Exhibit A hereto.

(h) The Company will not take, directly or indirectly, any action designed to or that might constitute or that would reasonably be expected to cause or result in, under the Exchange Act or otherwise, stabilization or manipulation of the price of any security of the Company to facilitate the sale or resale of the Securities.

(i) The Company agrees to pay the costs and expenses relating to the following matters: (i) the preparation, printing or reproduction and filing with the Commission of the Registration Statement (including financial statements and exhibits thereto), each Preliminary Prospectus, the Prospectus and each Issuer Free Writing Prospectus, and each amendment or supplement to any of them; (ii) the printing (or reproduction) and delivery (including postage, air freight charges and charges for counting and packaging) of such copies of the Registration Statement, each Preliminary Prospectus, the Prospectus and each Issuer Free Writing Prospectus, and all amendments or supplements to any of them, as may, in each case, be reasonably requested for use in connection with the offering and sale of the Securities; (iii) the preparation, printing, authentication, issuance and delivery of certificates for the Securities, including any stamp or transfer taxes in connection with the original issuance and sale of the Securities; (iv) the printing (or reproduction) and delivery of this Agreement, any blue sky memorandum and all other agreements or documents printed (or reproduced) and delivered in connection with the offering of the Securities; (v) the registration of the Securities under the Exchange Act and the listing of Common Stock (including the Securities) on the Nasdaq Capital Market; (vi) any registration or qualification of the Securities for offer and sale under the securities or blue sky laws of the several states (including filing fees and the reasonable fees and expenses of counsel for the Underwriters relating to such registration and qualification); (vii) any filings required to be made with the Financial Industry Regulatory Authority, Inc. ("***FINRA***") (including filing fees and the reasonable fees and expenses of counsel for the Underwriters relating to such filings, with such fees and expenses of counsel not to exceed $30,000); (viii) the transportation and other expenses incurred by or on behalf of Company representatives in connection with presentations to prospective purchasers of the Securities; provided, however, that the Company shall only be responsible for one half of the cost of any aircraft chartered in connection with the "road show" for the Securities; (ix) the fees and expenses of the Company's accountants and the fees and expenses of counsel (including local and special counsel) for the Company; and (x) all other costs and expenses incident to the performance by the Company of its obligations hereunder.

(j) The Company agrees that, unless it has or shall have obtained the prior written consent of the Representatives, and each Underwriter, severally and not jointly, agrees with the Company that, unless it has or shall have obtained, as the case may be, the prior written consent of the Company, it has not made and will not make any offer relating to the Securities that would constitute an Issuer Free Writing Prospectus or that would otherwise constitute a "free writing prospectus" (as defined in Rule 405) required to be filed by the Company with the Commission or retained by the Company under Rule 433; provided that the prior written consent of the parties hereto shall be deemed to have been given in respect of the Free Writing Prospectuses included in Schedule II hereto any electronic road show. Any such free writing prospectus consented to by the Representatives or the Company is hereinafter referred to as a "Permitted Free Writing Prospectus." The Company agrees that (x) it has treated and will treat, as the case may be, each Permitted Free Writing Prospectus as an Issuer Free Writing Prospectus and (y) it has complied and will comply,

as the case may be, with the requirements of Rules 164 and 433 applicable to any Permitted Free Writing Prospectus, including in respect of timely filing with the Commission, legending and record keeping.

(k) The Company will notify promptly the Representatives if the Company ceases to be an Emerging Growth Company at any time prior to the later of (a) completion of the distribution of the Securities within the meaning of the Act and (b) completion of the 90-day restricted period referred to in Section 5(i)(g) hereof.

(l) If at any time following the distribution of any Written Testing-the-Waters Communication, any event occurs as a result of which such Written Testing-the-Waters Communication would include any untrue statement of a material fact or omit to state any material fact necessary to make the statements therein in the light of the circumstances under which they were made at such time not misleading, the Company will (i) notify promptly the Representatives so that use of the Written Testing-the-Waters Communication may cease until it is amended or supplemented; (ii) amend or supplement the Written Testing-the-Waters Communication to correct such statement or omission; and (iii) supply any amendment or supplement to the Representatives in such quantities as may be reasonably requested.

6. Conditions to the Obligations of the Underwriters. The obligations of the Underwriters to purchase the Firm Shares and the Option Shares, as the case may be, shall be subject to the accuracy of the representations and warranties on the part of the Company contained herein as of the Execution Time, the Closing Date and any settlement date pursuant to Section 3 hereof, to the accuracy of the statements of the Company made in any certificates pursuant to the provisions hereof, to the performance by the Company of its obligations hereunder and to the following additional conditions:

(a) The Prospectus, and any supplement thereto, have been filed in the manner and within the time period required by Rule 424(b); any material required to be filed by the Company pursuant to Rule 433(d) under the Act shall have been filed with the Commission within the applicable time periods prescribed for such filings by Rule 433; and no stop order suspending the effectiveness of the Registration Statement or any notice objecting to its use shall have been issued and no proceedings for that purpose shall have been instituted or threatened.

(b) The Company shall have requested and caused Ropes & Gray LLP, counsel for the Company, to have furnished to the Representatives their opinion and negative assurance letter, dated the Closing Date and addressed to the Representatives, substantially in the form attached as Exhibits B-1 and B-2.

(c) The Company shall have requested and caused Choate Hall & Stewart LLP, intellectual property counsel for the Company, to have furnished to the Representatives their opinion, dated the Closing Date and addressed to the Representatives, substantially in the form attached hereto as Exhibit C.

(d) The Representatives shall have received from Cooley LLP, counsel for the Underwriters, their opinion and negative assurance letter, dated the Closing Date and addressed to

the Representatives, with respect to the issuance and sale of the Securities, the Registration Statement, the Disclosure Package, the Prospectus (together with any supplement thereto) and other related matters as the Representatives may reasonably require, and the Company shall have furnished to such counsel such documents as they request for the purpose of enabling them to pass upon such matters.

(e) The Company shall have furnished to the Representatives a certificate of the Company, signed by the President and Chief Executive Officer and the Chief Financial Officer of the Company, dated the Closing Date, to the effect that the signers of such certificate have carefully examined the Registration Statement, the Disclosure Package, the Prospectus and any amendment or supplement thereto, as well as each electronic road show used in connection with the offering of the Securities, and this Agreement and that:

(i) the representations and warranties of the Company in this Agreement are true and correct on and as of the Closing Date with the same effect as if made on the Closing Date and the Company has complied with all the agreements and satisfied all the conditions on its part to be performed or satisfied at or prior to the Closing Date;

(ii) no stop order suspending the effectiveness of the Registration Statement or any notice objecting to its use has been issued and no proceedings for that purpose have been instituted or, to the Company's knowledge, threatened; and

(iii) since the date of the most recent financial statements included in the Disclosure Package and the Prospectus (exclusive of any supplement thereto), there has been no Material Adverse Effect, except as set forth in or contemplated in the Disclosure Package and the Prospectus (exclusive of any supplement thereto).

(f) The Company shall have furnished to the Representatives a Secretary's Certificate of the Company, in form and substance reasonably satisfactory to counsel to the Underwriters and customary for the type of offering contemplated by this Agreement.

(g) The Company shall have furnished to the Representatives a certificate, dated such Closing Date, of its Chief Financial Officer, or an officer acting in a similar capacity, in form and substance reasonably satisfactory to the Representatives.

(h) The Company shall have requested and caused Ernst & Young LLP to have furnished to the Representatives, at the Execution Time and at the Closing Date, letters, dated respectively as of the Execution Time and as of the Closing Date, in form and substance satisfactory to the Representatives, substantially in the form as set forth in Exhibit D.

(i) Subsequent to the Execution Time or, if earlier, the dates as of which information is given in the Registration Statement (exclusive of any amendment thereof) and the Prospectus (exclusive of any amendment or supplement thereto), there shall not have been (i) any change or

decrease specified in the letter or letters referred to in paragraph (h) of this Section 6 or (ii) any change, or any development involving a prospective change, in or affecting the condition (financial or otherwise), earnings, business or properties of the Company, whether or not arising from transactions in the ordinary course of business, except as set forth in or contemplated in the Disclosure Package and the Prospectus (exclusive of any supplement thereto) the effect of which, in any case referred to in clause (i) or (ii) above, is, in the sole judgment of the Representatives, so material and adverse as to make it impractical or inadvisable to proceed with the offering or delivery of the Securities as contemplated by the Registration Statement (exclusive of any amendment thereof), the Disclosure Package and the Prospectus (exclusive of any amendment or supplement thereto).

(j) Prior to the Closing Date, the Company shall have furnished to the Representatives such further information, certificates and documents as the Representatives may reasonably request.

(k) Subsequent to the Execution Time, there shall not have been any decrease in the rating of any of the Company's debt securities by any "nationally recognized statistical rating organization" (as defined for purposes of Rule 436(g) under the Act) or any notice given of any intended or potential decrease in any such rating or of a possible change in any such rating that does not indicate the direction of the possible change.

(l) The Securities shall have been listed and admitted and authorized for trading on the Nasdaq Capital Market, and satisfactory evidence of such actions shall have been provided to the Representatives, subject to the official notice of issuance.

(m) At the Execution Time, the Company shall have furnished to the Representatives a letter substantially in the form of Exhibit A hereto from each officer, director and specified stockholders, as set forth in Schedule III, of the Company addressed to the Representatives.

If any of the conditions specified in this Section 6 shall not have been fulfilled when and as provided in this Agreement, or if any of the opinions and certificates mentioned above or elsewhere in this Agreement shall not be reasonably satisfactory in form and substance to the Representatives and counsel for the Underwriters, this Agreement and all obligations of the Underwriters hereunder may be canceled at, or at any time prior to, the Closing Date by the Representatives. Notice of such cancellation shall be given to the Company in writing or by telephone or facsimile confirmed in writing.

The documents required to be delivered by this Section 6 shall be delivered at the office of Cooley LLP, counsel for the Underwriters, at 55 Hudson Yards, New York, NY 10001, on the Closing Date.

7. Reimbursement of Underwriters' Expenses. If the sale of the Securities provided for herein is not consummated because any condition to the obligations of the Underwriters set forth in Section 6 hereof is not satisfied, because of any termination pursuant to Section 10 hereof or because of any refusal, inability or failure on the part of the Company to perform any agreement herein or comply with any provision hereof other than by reason of a default by any of the Underwriters, the Company will reimburse the Underwriters severally through SVB Leerink

LLC on demand for all accountable expenses (including reasonable fees and disbursements of counsel) that shall have been incurred by them in connection with the proposed purchase and sale of the Securities.

1. Indemnification and Contribution.

(a) The Company agrees to indemnify and hold harmless each Underwriter, its affiliates and their respective partners, members, directors, officers, employees and agents and each person who controls any Underwriter within the meaning of either the Act or the Exchange Act against any and all losses, claims, damages or liabilities, joint or several, to which they or any of them may become subject under the Act, the Exchange Act or other Federal or state statutory law or regulation, at common law or otherwise, insofar as such losses, claims, damages or liabilities (or actions in respect thereof) arise out of or are based upon any untrue statement or alleged untrue statement of a material fact contained in the registration statement for the registration of the Securities as originally filed or in any amendment thereof, or in any Preliminary Prospectus, or the Prospectus or any Issuer Free Writing Prospectus, or any Written Testing-the-Waters Communication or in any amendment thereof or supplement thereto, or arise out of or are based upon the omission or alleged omission to state therein a material fact required to be stated therein or necessary to make the statements therein not misleading, and agrees to reimburse each such indemnified party, as incurred, for any legal or other expenses reasonably incurred by them in connection with investigating or defending any such loss, claim, damage, liability or action; provided, however, that the Company will not be liable in any such case to the extent that any such loss, claim, damage or liability arises out of or is based upon any such untrue statement or alleged untrue statement or omission or alleged omission made therein in reliance upon and in conformity with written information furnished to the Company by or on behalf of any Underwriter through the Representatives specifically for inclusion therein. This indemnity agreement will be in addition to any liability which the Company may otherwise have.

(b) Each Underwriter severally and not jointly agrees to indemnify and hold harmless the Company, each of its directors, each of its officers who signs the Registration Statement, and each person who controls the Company within the meaning of either the Act or the Exchange Act, to the same extent as the foregoing indemnity to each Underwriter, but only with reference to written information relating to such Underwriter furnished to the Company by or on behalf of such Underwriter through the Representatives specifically for inclusion in the documents referred to in the foregoing indemnity. This indemnity agreement will be in addition to any liability which any Underwriter may otherwise have. The Company acknowledges that the statements set forth in the first paragraph under the caption “Commissions and Discounts,” the second sentence of the first paragraph, first sentence of the second paragraph, the first sentence of the third paragraph and the first sentence of the sixth paragraph under the caption “Price Stabilization, Short Positions and Penalty Bids” under the heading “Underwriting” in the Pricing Prospectus and Prospectus constitute the only information furnished in writing by or on behalf of the several Underwriters for inclusion in any Preliminary Prospectus, the Prospectus or any Issuer Free Writing Prospectus.

(c) Promptly after receipt by an indemnified party under this Section 8 of notice of the commencement of any action, such indemnified party will, if a claim in respect thereof is to be

made against the indemnifying party under this Section 8, notify the indemnifying party in writing of the commencement thereof; but the failure to notify the indemnifying party (i) will not relieve it from liability under paragraph (a) or (b) above unless and to the extent it did not otherwise learn of such action and such failure results in the forfeiture by the indemnifying party of substantial rights and defenses and (ii) will not, in any event, relieve the indemnifying party from any obligations to any indemnified party other than the indemnification obligation provided in paragraph (a) or (b) above. The indemnifying party shall be entitled to appoint counsel of the indemnifying party's choice at the indemnifying party's expense to represent the indemnified party in any action for which indemnification is sought (in which case the indemnifying party shall not thereafter be responsible for the fees and expenses of any separate counsel retained by the indemnified party or parties except as set forth below); provided, however, that such counsel shall be satisfactory to the indemnified party. Notwithstanding the indemnifying party's election to appoint counsel to represent the indemnified party in an action, the indemnified party shall have the right to employ separate counsel (including local counsel), and the indemnifying party shall bear the reasonable fees, costs and expenses of such separate counsel (which, if the Company is the indemnifying party, shall be limited to one such separate counsel plus local counsel for any Underwriter together with all persons who control such Underwriter within the meaning of the Exchange Act or the Act, and no more than one separate counsel for all the Underwriters, if (i) the use of counsel chosen by the indemnifying party to represent the indemnified party would present such counsel with a conflict of interest, (ii) the actual or potential defendants in, or targets of, any such action include both the indemnified party and the indemnifying party and the indemnified party shall have reasonably concluded that there may be legal defenses available to it and/or other indemnified parties which are different from or additional to those available to the indemnifying party, (iii) the indemnifying party shall not have employed counsel satisfactory to the indemnified party to represent the indemnified party within a reasonable time after notice of the institution of such action or (iv) the indemnifying party shall authorize the indemnified party to employ separate counsel at the expense of the indemnifying party. An indemnifying party will not, without the prior written consent of the indemnified parties, settle or compromise or consent to the entry of any judgment with respect to any pending or threatened claim, action, suit or proceeding in respect of which indemnification or contribution may be sought hereunder (whether or not the indemnified parties are actual or potential parties to such claim or action) unless such settlement, compromise or consent includes an express and unconditional release of each indemnified party from all liability arising out of such claim, action, suit or proceeding and does not include a statement as to or an admission of fault, culpability or a failure to act by or on behalf of any indemnified party.

(d) In the event that the indemnity provided in paragraph (a) or (b) of this Section 8 is unavailable to or insufficient to hold harmless an indemnified party for any reason, the Company and the Underwriters severally agree to contribute to the aggregate losses, claims, damages and liabilities (including legal or other expenses reasonably incurred in connection with investigating or defending same) (collectively "***Losses***") to which the Company and one or more of the Underwriters may be subject in such proportion as is appropriate to reflect the relative benefits received by the Company, on the one hand and by the Underwriters, on the other, from the offering of the Securities. If the allocation provided by the immediately preceding sentence is unavailable for any reason, the Company and the Underwriters severally shall contribute in such proportion as is appropriate to reflect not only such relative benefits but also the relative fault of the Company,

on the one hand, and of the Underwriters, on the other, in connection with the statements or omissions which resulted in such Losses as well as any other relevant equitable considerations. Benefits received by the Company shall be deemed to be equal to the total net proceeds from the offering (before deducting expenses) received by it, and benefits received by the Underwriters shall be deemed to be equal to the total underwriting discounts and commissions, in each case as set forth on the cover page of the Prospectus. Relative fault shall be determined by reference to, among other things, whether any untrue or any alleged untrue statement of a material fact or the omission or alleged omission to state a material fact relates to information provided by the Company on the one hand or the Underwriters on the other, the intent of the parties and their relative knowledge, access to information and opportunity to correct or prevent such untrue statement or omission. The Company and the Underwriters agree that it would not be just and equitable if contribution were determined by pro rata allocation or any other method of allocation which does not take account of the equitable considerations referred to above. Notwithstanding the provisions of this paragraph (d), no Underwriter (except as may be provided in any agreement among underwriters relating to the offering of the Securities) shall be responsible for any amount in excess of the underwriting discount or commission applicable to the Securities purchased by such Underwriter hereunder and no person guilty of fraudulent misrepresentation (within the meaning of Section 11(f) of the Act) shall be entitled to contribution from any person who was not guilty of such fraudulent misrepresentation. For purposes of this Section 8, each person who controls an Underwriter within the meaning of either the Act or the Exchange Act and each director, officer, employee and agent of an Underwriter shall have the same rights to contribution as such Underwriter, and each person who controls the Company within the meaning of either the Act or the Exchange Act, each officer of the Company who shall have signed the Registration Statement and each director of the Company shall have the same rights to contribution as the Company, subject in each case to the applicable terms and conditions of this paragraph (d).

2. Default by an Underwriter. If any one or more Underwriters shall fail to purchase and pay for any of the Securities agreed to be purchased by such Underwriter or Underwriters hereunder and such failure to purchase shall constitute a default in the performance of its or their obligations under this Agreement, the remaining Underwriters shall be obligated severally to take up and pay for (in the respective proportions which the amount of Shares set forth opposite their names in Schedule I hereto bears to the aggregate amount of Shares set forth opposite the names of all the remaining Underwriters) the Securities which the defaulting Underwriter or Underwriters agreed but failed to purchase; provided, however, that in the event that the aggregate amount of Shares which the defaulting Underwriter or Underwriters agreed but failed to purchase shall exceed 10% of the aggregate amount of Shares set forth in Schedule I hereto, the remaining Underwriters shall have the right to purchase all, but shall not be under any obligation to purchase any, of the Securities, and if such nondefaulting Underwriters do not purchase all the Securities, this Agreement will terminate without liability to any nondefaulting Underwriter or the Company. In the event of a default by any Underwriter as set forth in this Section 9, the Closing Date shall be postponed for such period, not exceeding five Business Days, as the Representatives shall determine in order that the required changes in the Registration Statement and the Prospectus or in any other documents or arrangements may be effected. Nothing contained in this Agreement shall relieve any defaulting Underwriter of its liability, if any, to the Company and any nondefaulting Underwriter for damages occasioned by its default hereunder.

3. Termination. This Agreement shall be subject to termination in the absolute discretion of the Representatives, by notice given to the Company prior to delivery of and payment for the Securities, if at any time prior to such delivery and payment (i) (a) trading in the Company's Common Stock shall have been suspended by the Commission or the Nasdaq Capital Market or (b) trading in securities generally on the New York Stock Exchange or the Nasdaq Capital Market shall have been suspended or limited or minimum prices shall have been established on either of such exchanges, (ii) a banking moratorium shall have been declared either by Federal or New York State authorities or (iii) there shall have occurred any outbreak or escalation of hostilities, declaration by the United States of a national emergency or war, or other calamity or crisis the effect of which on financial markets is such as to make it, in the sole judgment of the Representatives, impractical or inadvisable to proceed with the offering or delivery of the Securities as contemplated by the Preliminary Prospectus or the Prospectus (exclusive of any supplement thereto).

4. Representations and Indemnities to Survive. The respective agreements, representations, warranties, indemnities and other statements of the Company or its officers and of the Underwriters set forth in or made pursuant to this Agreement will remain in full force and effect, regardless of any investigation made by or on behalf of any Underwriter or the Company or any of the officers, directors, employees, agents or controlling persons referred to in Section 8 hereof, and will survive delivery of and payment for the Securities. The provisions of Sections 7 and 8 hereof shall survive the termination or cancellation of this Agreement.

5. Notices. All communications hereunder will be in writing and effective only on receipt, and, if sent to the Representatives, will be mailed, delivered or telefaxed to SVB Leerink LLC at One Federal Street, Floor 37, Boston, Massachussets 02110, Attention: John I. Fitzgerald, Esq. (facsimile: (617) 918-4664) and Stifel, Nicolaus & Company, Incorporated, One Montgomery Street, Suite 3700, San Francisco, California 94104, Attention: Syndicate Department; (facsimile: (415) 364-2799). If sent to the Company, will be mailed, delivered or telefaxed to (617) 500-0969 and confirmed to it at Cambridge Discovery Park, 100 Acorn Park Drive, 5th Floor, Cambridge, MA 02140, attention of the Legal Department.

6. Successors. This Agreement will inure to the benefit of and be binding upon the parties hereto and their respective successors and the officers, directors, employees, agents and controlling persons referred to in Section 8 hereof, and no other person will have any right or obligation hereunder.

7. Jurisdiction. Each of the parties hereto submits to the exclusive jurisdiction of the courts of the State of New York and the courts of the United States of America located in the State of New York over any suit, action or proceeding with respect to this Agreement or the transactions contemplated hereby. Any suit, action or proceeding with respect to this Agreement may be brought only in the courts of the State of New York or the courts of the United States of America, in each case located in the Borough of Manhattan, City of New York, State of New York. Each of the parties hereto waives any objection that it may have to the venue of such suit, action or proceeding in any such court or that such suit, action or proceeding in such court was brought in an inconvenient forum and agrees not to plead or claim the same. The Company agrees that final judgment in any such suit, action or proceeding brought in such court shall be conclusive and binding

upon the Company and may be enforced in any court to the jurisdiction of which Company is subject by a suit upon such judgment.

8. Recognition of the U.S. Special Resolution Regimes.

(a) In the event that any Underwriter that is a Covered Entity becomes subject to a proceeding under a U.S. Special Resolution Regime, the transfer from such Underwriter of this Agreement, and any interest and obligation in or under this Agreement, will be effective to the same extent as the transfer would be effective under the U.S. Special Resolution Regime if this Agreement, and any such interest and obligation, were governed by the laws of the United States or a state of the United States.

(b) In the event that any Underwriter that is a Covered Entity or a BHC Act Affiliate of such Underwriter becomes subject to a proceeding under a U.S. Special Resolution Regime, Default Rights under this Agreement that may be exercised against such Underwriter are permitted to be exercised to no greater extent than such Default Rights could be exercised under the U.S. Special Resolution Regime if this Agreement were governed by the laws of the United States or a state of the United States.

9. No Fiduciary Duty. The Company hereby acknowledges that (a) the purchase and sale of the Securities pursuant to this Agreement is an arm's-length commercial transaction between the Company, on the one hand, and the Underwriters and any affiliate through which it may be acting, on the other, (b) the Underwriters are acting as principal and not as an agent or fiduciary of the Company and (c) the engagement of the Underwriters by the Company in connection with the offering and the process leading up to the offering is as independent contractors and not in any other capacity. Furthermore, the Company agrees that it is solely responsible for making its own judgments in connection with the offering (irrespective of whether any of the Underwriters has advised or is currently advising the Company on related or other matters). The Company agrees that it will not claim that the Underwriters have rendered advisory services of any nature or respect, or owe an agency, fiduciary or similar duty to it, in connection with such transaction or the process leading thereto.

10. Integration. This Agreement supersedes all prior agreements and understandings (whether written or oral) between the Company and the Underwriters, or any of them, with respect to the subject matter hereof.

11. Applicable Law. This Agreement will be governed by and construed in accordance with the laws of the State of New York applicable to contracts made and to be performed within the State of New York.

12. Waiver of Jury Trial. The Company and the Underwriters hereby irrevocably waive, to the fullest extent permitted by applicable law, any and all right to trial by jury in any legal proceeding arising out of or relating to this Agreement or the transactions contemplated hereby.

13. Compliance with USA Patriot Act. In accordance with the requirements of the USA Patriot Act (Title III of Pub. L. 107-56 (signed into law October 26, 2001)), the Underwriters

are required to obtain, verify and record information that identifies their respective clients, including the Company, which information may include the name and address of their respective clients, as well as other information that will allow the Underwriters to properly identify their respective clients.

14. Counterparts. This Agreement may be signed in one or more counterparts, each of which shall constitute an original and all of which together shall constitute one and the same agreement.

15. Headings. The section headings used herein are for convenience only and shall not affect the construction hereof.

16. Definitions. The terms that follow, when used in this Agreement, shall have the meanings indicated.

"***Act***" shall mean the Securities Act of 1933, as amended, and the rules and regulations of the Commission promulgated thereunder.

"***BHC Act Affiliate***" shall have the meaning assigned to the term "affiliate" in, and shall be interpreted in accordance with, 12 U.S.C. § 1841(k).

"***Business Day***" shall mean any day other than a Saturday, a Sunday or a legal holiday or a day on which banking institutions or trust companies are authorized or obligated by law to close in New York City.

"***Commission***" shall mean the Securities and Exchange Commission.

"***Covered Entity***" shall mean any of the following: (i) a "covered entity" as that term is defined in, and interpreted in accordance with, 12 C.F.R. § 252.82(b), (ii) a "covered bank" as that term is defined in, and interpreted in accordance with, 12 C.F.R. § 47.3(b) or (iii) a "covered FSI" as that term is defined in, and interpreted in accordance with, 12 C.F.R. § 382.2(b).

"***Default Right***" shall have the meaning assigned to that term in, and shall be interpreted in accordance with, 12 C.F.R. §§ 252.81, 47.2 or 382.1, as applicable.

"***Disclosure Package***" shall mean (i) the Preliminary Prospectus that is generally distributed to investors and used to offer the Securities, (ii) the Issuer Free Writing Prospectuses, if any, identified in Schedule II hereto, and (iii) any other Free Writing Prospectus that the parties hereto shall hereafter expressly agree in writing to treat as part of the Disclosure Package.

"***Effective Date***" shall mean each date and time that the Registration Statement, any post-effective amendment or amendments thereto and any Rule 462(b) Registration Statement became or becomes effective.

"***Exchange Act***" shall mean the Securities Exchange Act of 1934, as amended, and the rules and regulations of the Commission promulgated thereunder.

"***Execution Time***" shall mean the date and time that this Agreement is executed and delivered by the parties hereto.

"***Free Writing Prospectus***" shall mean a free writing prospectus, as defined in Rule 405.

"***Governmental Entity***" shall mean any national, federal, state, county, municipal, local or foreign government, or any political subdivision, court, body, agency or regulatory authority thereof, and any Person exercising executive, legislative, judicial, regulatory, taxing or administrative functions of or pertaining to any of the foregoing.

"***Issuer Free Writing Prospectus***" shall mean an issuer free writing prospectus, as defined in Rule 433.

"***Material Adverse Effect***" shall mean a circumstance that (i) could reasonably be expected to have a material adverse effect on the performance of this Agreement or the consummation of any of the transactions contemplated hereby or (ii) could reasonably be expected to have a material adverse effect on the condition (financial or otherwise), prospects, earnings, business or properties of the Company.

"***Preliminary Prospectus***" shall mean any preliminary prospectus referred to in paragraph 1(a) above and any preliminary prospectus included in the Registration Statement at the Effective Date that omits Rule 430A Information. Any reference to any Preliminary Prospectus shall be deemed to refer to and include any documents incorporated by reference therein pursuant to Form S-1 under the Act as of the date of such Preliminary Prospectus.

"***Prospectus***" shall mean the prospectus relating to the Securities that is first filed pursuant to Rule 424(b) after the Execution Time. Any reference to any Prospectus shall be deemed to refer to and include any documents incorporated by reference therein pursuant to Form S-1 under the Act as of the date of such Prospectus.

"***Registration Statement***" shall mean the registration statement referred to in paragraph 1(a) above, including information incorporated by reference therein pursuant to Form S-1 under the Act, exhibits and financial statements and any prospectus supplement relating to the Securities that is filed with the Commission pursuant to Rule 424(b) and deemed part of such registration statement pursuant to Rule 430A, as amended at the Execution Time and, in the event any post-effective amendment thereto or any Rule 462(b) Registration Statement becomes effective prior to the Closing Date, shall also mean such registration statement as so amended or such Rule 462(b) Registration Statement, as the case may be.

"***Rule 158***", "***Rule 172***", "***Rule 405***", "***Rule 415***", "***Rule 424***", "***Rule 430A***", and "***Rule 433***" refer to such rules under the Act.

"***Rule 430A Information***" shall mean information with respect to the Securities and the offering thereof permitted to be omitted from the Registration Statement when it becomes effective pursuant to Rule 430A.

"***Rule 462(b) Registration Statement***" shall mean a registration statement and any amendments thereto filed pursuant to Rule 462(b) relating to the offering covered by the registration statement referred to in Section 1(a) hereof.

"***U.S. Special Resolution Regime***" shall mean each of (i) the Federal Deposit Insurance Act and the regulations promulgated thereunder and (ii) Title II of the Dodd-Frank Wall Street Reform and Consumer Protection Act and the regulations promulgated thereunder.

If the foregoing is in accordance with your understanding of our agreement, please sign and return to us the enclosed duplicate hereof, whereupon this letter and your acceptance shall represent a binding agreement among the Company and the several Underwriters.

Very truly yours,

Genocea Biosciences, Inc.

By:__

Name:

Title:

The foregoing Agreement is hereby
confirmed and accepted as of the
DATE FIRST ABOVE WRITTEN.

SVB LEERINK LLC
STIFEL, NICOLAUS & COMPANY, INCORPORATED

SVB Leerink LLC

By:__
Name:
Title:

Stifel, Nicolaus & Company, Incorporated

By:__
Name:
Title:

For itself and the other
several Underwriters named in
Schedule I to the foregoing
Agreement

SCHEDULE I

Underwriters	**Number of Firm Shares to be Purchased**	**Number of Option Shares to be Purchased**
SVB Leerink LLC	[__]	[__]
Stifel, Nicolaus & Company, Incorporated	[__]	[__]
Robert W. Baird & Co.	[__]	[__]
Needham & Company, LLC	[__]	[__]
Total	[__]	[__]

SCHEDULE II

Schedule of Free Writing Prospectuses included in the Disclosure Package

[__]

SCHEDULE III

Lock-up Agreements
Officers
Girish Aakalu, Ph.D.
William Clark
Jessica Baker Flechtner
Pamela Carroll, Ph.D.
Tom Davis, M.D.
Diantha Duvall
Derek Meisner
Narinder Singh
Directors
Kenneth Bate
Ali Behbahani
Katrine Bosley
Ronald Cooper
Michael Higgins
Howard Mayer
George Siber
Affiliated shareholders
New Enterprise Associates 16, L.P.

Exhibit 1.1

EXHIBIT A

[FORM OF LOCKUP AGREEMENT]

Genocea Biosciences, Inc.
Public Underwritten Offering of Common Stock

_____, 2019

SVB Leerink LLC
Stifel, Nicolaus & Company, Incorporated
As Representatives of the several Underwriters
c/o SVB Leerink LLC
One Federal Street
37th Floor
Boston, MA 02110

c/o Stifel, Nicolaus & Company, Incorporated
One Montgomery Street, Suite 3700
San Francisco, CA 94104

Ladies and Gentlemen:

This letter is being delivered to you in connection with the proposed Underwriting Agreement (the "Underwriting Agreement"), among Genocea Biosciences, Inc., a Delaware corporation (the "Company"), and each of you as representatives (the "Representatives") of a group of underwriters (the "Underwriters") named therein, relating to an underwritten public offering (the "Offering") of common stock, $0.001 par value per share (the "Common Stock"), of the Company.

In order to induce you and the other Underwriters to enter into the Underwriting Agreement, the undersigned will not, without the prior written consent of the Representatives, offer, sell, contract to sell, pledge or otherwise dispose of, (or enter into any transaction which is designed to, or might reasonably be expected to, result in the disposition (whether by actual disposition or effective economic disposition due to cash settlement or otherwise) by the undersigned), directly or indirectly, including the filing (or participation in the filing) of a registration statement with the Securities and Exchange Commission in respect of, or establish or increase a put equivalent position or liquidate or decrease a call equivalent position within the meaning of Section 16 of the Securities Exchange Act of 1934, as amended, (the "Exchange Act") and the rules and regulations of the Securities and Exchange Commission promulgated thereunder

with respect to, any shares of capital stock of the Company or any securities convertible into, or exercisable or exchangeable for such capital stock, or publicly announce an intention to effect any such transaction, for a period from the date hereof until 90 days after the date of the Underwriting Agreement (the "Lock-Up Period"), other than (i) shares of Common Stock or securities convertible into or exchangeable for Common Stock disposed of as bona fide gifts where each recipient of a gift of shares agrees in writing to be bound by the same restrictions in place for the undersigned pursuant to this letter for the duration that such restrictions remain in effect at the time of transfer; (ii) exercise of options or warrants to purchase shares of Common Stock or securities convertible into or exchangeable for Common Stock or the receipt of shares of Common Stock upon the vesting of restricted stock awards disclosed in the prospectus or any related transfer of shares of Common Stock to the Company (x) deemed to occur upon the cashless exercise of such options or (y) for the purpose of paying the exercise price of such options or for paying taxes due as a result of the exercise of such options or as a result of the vesting of such shares of Common Stock, it being understood that all shares of Common Stock received upon such exercise or transfer will remain subject to the restrictions of this agreement during the 90-day period referred to above; (iii) transfers of Common Stock or securities convertible into or exchangeable for Common Stock to any affiliate (as such term is defined in Rule 405 of the Securities Act of 1933, as amended), limited partners, general partners, limited liability company members of stockholders of the undersigned, or if the undersigned is a corporation to any wholly-owned subsidiary of such corporation, *provided* that in each case (x) the recipient agrees to be bound in writing by the same restrictions set forth herein, (y) no filing under Section 16(a) of the Exchange Act reporting a reduction in beneficial ownership of shares of Common Stock shall be required during the 90-day period referred to above, and (z) no filing under Section 16(a) of the Exchange Act shall be voluntarily made by the undersigned or the transferee during the 90-day period referred to above; and (iv) the establishment of a trading plan pursuant to Rule 10b5-1 under the Exchange Act for the transfer of shares of Common Stock or securities convertible into or exchangeable for Common Stock or transfers of Common Stock pursuant to the undersigned's established Rule 10b5-1 Sales Plan in effect as of the date hereof (the "Existing Plan"), if applicable, *provided* that such plan does not provide for the transfer of shares of Common Stock during the restricted period specified in this letter and no filing or other public announcement shall be required during the 90-day period referred to above, except in each case for transfers under the Existing Plan, if applicable. The foregoing restrictions shall not apply to transactions relating to the shares of Common Stock acquired by the undersigned in the Offering or in open market transactions subsequent to the closing of the Offering, *provided* that (i) no filing under Section 16(a) of the Exchange Act reporting a reduction in beneficial ownership of shares of Common Stock shall be required and (ii) no filing under Section 16(a) of the Exchange Act shall be voluntarily made by the undersigned, in the case of both clauses (i) and (ii), during the 90-day period referred to above. If the undersigned is an officer or director of the Company, the undersigned further agrees that the foregoing restrictions shall be equally applicable to any issuer-directed shares of Common Stock the undersigned may purchase in the Offering.

This agreement shall automatically terminate upon the earliest to occur, if any, of (i) the date that the Company advises the Representatives, or the Representatives advise the

Company, in writing, prior to the execution of the Underwriting Agreement, that it has determined not to proceed with the Offering, (ii) the date of termination of the Underwriting Agreement if prior to the closing of the Offering, or (iii) August 16, 2019 if the Offering has not been completed by such date.

Yours very truly,

Name:
Address:

ROPES & GRAY LLP
PRUDENTIAL TOWER
800 BOYLSTON STREET
BOSTON, MA 02199-3600
WWW.ROPESGRAY.COM

Exhibit 5.1

June 18, 2019

Genocea Biosciences, Inc.
Cambridge Discovery Park
100 Acorn Park Drive, 5th Floor
Cambridge, MA 02140
(617) 876-8191

Re: Registration Statement on Form S-1 (File No. 333-232023)

Ladies and Gentlemen:

This opinion letter is furnished to you in connection with the above-referenced registration statement (the "Registration Statement"), filed with the Securities and Exchange Commission (the "Commission") under the Securities Act of 1933, as amended (the "Securities Act"), for the registration of 11,500,000 shares of common stock, $0.001 par value per share (the "Securities"), of Genocea Biosciences, Inc., a Delaware corporation (the "Company"), including 1,500,000 Securities that may be purchased by the underwriters pursuant to their option to purchase additional shares. The Securities are proposed to be sold pursuant to an underwriting agreement (the "Underwriting Agreement") to be entered into among the Company and the underwriters named therein.

We have acted as counsel for the Company in connection with the proposed sale of the Securities. For purposes of this opinion, we have examined and relied upon such certificates, documents and records and have made such investigation of fact and such examination of law as we have deemed appropriate in order to enable us to render the opinions set forth herein. In conducting such investigation, we have relied, without independent verification, upon certificates of officers of the Company, public officials and other appropriate persons.

The opinions expressed below are limited to the Delaware General Corporation Law.

Based upon and subject to the foregoing, we are of the opinion that the Securities have been duly authorized and, when issued and delivered pursuant to the Underwriting Agreement and against payment of the consideration set forth therein, will be validly issued, fully paid and non-assessable.

We hereby consent to your filing this opinion as an exhibit to the Registration Statement and to the use of our name therein and in the related prospectus under the caption "Legal Matters." In giving such consent, we do not thereby admit that we are in the category of persons whose consent is required under Section 7 of the Securities Act or the rules and regulations of the Commission thereunder.

Very truly yours,

_/s/ Ropes & Gray LLP_____
Ropes & Gray LLP

Exhibit 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the reference to our firm under the caption "Experts" and to the use of our report dated February 28, 2019, in Amendment No. 1 to the Registration Statement (Form S-1 No. 333-232023) and related Prospectus of Genocea Biosciences, Inc. for the registration of 11,500,000 shares of its common stock.

/s/ Ernst & Young LLP

Boston, Massachusetts
June 18, 2019