GENOCEA BIOSCIENCES, INC.
Form S-1
July 03, 2014

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As filed with the Securities and Exchange Commission on July 3, 2014

Registration No. 333-

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

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 5th Floor
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 5th Floor
Cambridge, MA 02140
(617) 876-8191

(Name, address, including zip code, and telephone number, including area code, of agent for service)

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Approximate date of commencement of proposed sale to 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. o

If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) 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. o

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. o

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. o

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

Large accelerated filer o	Accelerated filer o	Non-accelerated filer ý (Do not check if a smaller reporting company)	Smaller reporting company o

CALCULATION OF REGISTRATION FEE

Title of Each Class of Securities to be Registered	Proposed Maximum Aggregate Offering Price(1)	Amount of Registration Fee(2)
Common Stock, $0.001 par value per share	$69,000,000	$8,888

(1) Estimated solely for the purpose of calculating the registration fee in accordance with Rule 457(o) of the Securities Act of 1933, as amended.

(2) Calculated pursuant to Rule 457(o) based on the proposed maximum aggregate offering price.

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 Securities and Exchange Commission, acting pursuant to said Section 8(a), may determine.

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The information in this preliminary prospectus is not complete and may be changed. This preliminary prospectus is not an offer to sell these securities and we are not soliciting offers to buy these securities in any jurisdiction where the offer or sale is not permitted.

SUBJECT TO COMPLETION, DATED JULY 3, 2014

PRELIMINARY PROSPECTUS

$60,000,000

Common Stock

$ per share

We are selling shares of our common stock.

We have granted the underwriters an option to purchase up to additional shares of common stock.

Our common stock is listed on the NASDAQ Global Market under the symbol "GNCA". On July 2, 2014, the last sale price on our common stock was $17.61 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.

Investing in our common stock involves risk. See "Risk Factors" beginning on page 11.

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.

	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 126 for additional information regarding underwriting compensation.

The underwriters expect to deliver the shares of common stock to investors on or about , 2014 through the book entry facilities of The Depositary Trust Company.

Citigroup **Cowen and Company**

Stifel

Needham & Company

, 2014

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We are responsible for the information contained in this prospectus and in any free-writing prospectus we prepare or authorize. We have not authorized anyone to provide you with different information, and we take no responsibility for any other information others may give you. We are not, and the underwriters are not, making an offer to sell these securities in any jurisdiction where the offer or sale is not permitted. You should not assume that the information contained in this prospectus is accurate as of any date other than the date on the cover of this prospectus.

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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, 2013 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," in each case appearing elsewhere in this prospectus, in our Annual Report on Form 10-K for the year ended December 31, 2013 or in our Quarterly Report on Form 10-Q for the quarter ended March 31, 2014, 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 clinical stage biotechnology company that discovers and develops novel vaccines and immunotherapies to address diseases with significant unmet medical needs. We use our proprietary discovery platform, ATLAS, to rapidly design products that act through T cell (or cellular) immune responses, in contrast to approved products, which are designed to act primarily through B cell (or antibody) immune responses. We believe that by harnessing T cells we can develop first-in-class products to treat or prevent diseases where T cells are central to the control of the disease.

In September 2013, we announced human proof-of-concept data for GEN-003, a candidate therapeutic vaccine, or immunotherapy, that we are developing to treat herpes simplex virus-2, or HSV-2, infections. These data from our double-blind, placebo-controlled, dose-escalating Phase 1/2a trial represented the first reported instance of a therapeutic vaccine working against an infectious disease. We have now completed the follow-up review of patients for 12 months after their last dose of vaccine. Final analysis of the data showed that for the best performing 30μg dose group, there was a sustained reduction in the viral shedding rate. After completion of dosing for this dose group, the viral shedding rate fell by 52% versus baseline and, at six months after the final dose, the shedding rate remained at 40% below baseline. At 12 months, the viral shedding rate returned to baseline for this dose group. The reduction in the genital lesion rate after completion of the third dose was greatest for the 30μg dose group, at 48%. After six months, the reduction from baseline in genital lesion rate for this dose group was 65% and, after 12 months, the genital lesion rate was 42% lower than baseline. GEN-003 was safe and well tolerated over the 12 months of this trial. We believe the six-month duration of reduced viral shedding and genital lesion rates may be clinically meaningful. If GEN-003 successfully completes clinical development and is approved, we believe it would represent an important new treatment option for patients with HSV-2.

We are also developing a second T cell-stimulating vaccine candidate, GEN-004, a potential universal vaccine against pneumococcus, a leading cause of infectious disease mortality worldwide. In June 2014, we announced top line data from a Phase 1 clinical trial for GEN-004. This trial met its safety, tolerability and immunogenicity goals. We plan to advance GEN-004 into a Phase 2a trial in the third quarter of 2014.

Vaccine and Immunotherapy Overview

Vaccines represent a major healthcare success story, having eradicated or significantly reduced the global prevalence of many infectious diseases. Today, there are vaccines approved to protect against approximately 30 infectious diseases. Total global vaccine revenues in 2012 were $27 billion.

Vaccines work by training the immune system to respond to an infectious pathogen by exposing it to that pathogen, or a component of that pathogen, in a controlled way. Such components are often

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immunogenic molecules of a pathogen, called antigens. Vaccines rely on an ability of the human immune system, called adaptive immunity, to "remember" an invading organism and develop an immune response to it. The adaptive immune system consists of two main components: the B cell arm and the T cell arm. To date, all approved vaccines have been developed primarily to elicit B cell responses. B cells produce antibodies, which identify and initiate processes to kill foreign organisms by binding to one or more structures, such as antigens, on the pathogen surface. B cell responses are effective against organisms in the bloodstream, but are generally ineffective against those that reside primarily in host cells or mucosal surfaces such as those of the genitalia, nose and throat. For these organisms, no vaccines or vaccines with limited effectiveness exist. To address these pathogens, vaccines that engage the T cell immune system may represent the optimal solution.

Immunotherapies are designed to augment or boost the immune system to allow it to better protect the body against disease. In the case of infectious disease, currently approved immunotherapies aim to treat an infection rather than prevent it. A well-known example of an early immunotherapy is the use of existing interferon-alfa 2a to treat infections caused by hepatitis C virus, or HCV. Immunotherapy approaches against cancer have also been developed, with limited success. As with vaccines, we believe immunotherapies that engage the T cell immune system may represent an optimal solution to treat, and potentially prevent, disease.

Limitations and Challenges of Current Vaccine and Immunotherapy Discovery

We believe T cell target discovery has been particularly challenging for two reasons. The first is the diversity of human T cell responses. B cell responses to a particular antigen are generally more uniform across all humans than T cell responses. The specific antigens that elicit T cell responses vary across humans people from different genetic groups can have different T cell responses to the same invading organism. Traditional discovery involves testing antigens in animals which are typically bred from a single genetic lineage and cannot effectively account for the diversity of human T cell responses that is necessary to optimize vaccine design.

The second challenge to T cell target discovery relates to the number of target candidates. Antibodies typically target proteins on a pathogen's surface. For B cell vaccines eliciting an antibody response, the number of potential targets has typically been small, limiting the number and combination of targets that need to be tested to find a protective vaccine. By contrast, the potential targets for T cell responses include every protein in the pathogen, including proteins that are not just on the surface of the pathogen, which can number in the thousands. The number and combination of candidate T cell targets, therefore, increases exponentially with pathogen size. For many larger organisms, the complexities associated with the pathogen size have presented a fundamental barrier to the discovery of effective T cell vaccines using traditional vaccine discovery tools, which usually rely on empirically selecting the potential targets from the proteins of a pathogen and iteratively testing them in animal models. This process is slow and labor intensive and can take many years.

The ATLAS Discovery Platform: A Novel Approach to Vaccine and Immunotherapy Discovery

We have developed a proprietary technology platform that is designed to overcome the challenges associated with developing products that stimulate targeted T cell immunity. ATLAS, our AnTigen Lead Acquisition System, allows us to mimic *ex vivo*, or outside the body, the T cell responses of human populations exposed to an infectious pathogen by using human blood samples from those populations. We use ATLAS as a high throughput engine to rapidly screen T cells from hundreds of human subjects against every protein in a pathogen, and use the pattern of responses for each subject to determine which pathogen proteins are associated with protective responses. By comparing antigens identified in individuals who naturally control their infection with those who do not, we can select the antigens that may have the best likelihood of inducing protective T cell immune responses.

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We believe that, by identifying T cell antigens in this way, ATLAS will help create vaccines and immunotherapies against pathogens that are generally inaccessible to antibodies and have therefore not been addressed successfully by B cell vaccines. By identifying the targets of human T cell responses *ex vivo* from human samples, rather than in animal models, we account for the diversity of human T cell responses. We also can screen every protein in a pathogen to choose from all possible antigens. We believe these factors will significantly increase our likelihood of success in efficiently discovering T cell-based vaccines against diseases associated with unmet needs.

GEN-003: A Therapeutic Vaccine Candidate for HSV-2

HSV-2 is a sexually transmitted disease affecting approximately 16% of the United States population between the ages of 14 to 49, and more than 500 million people worldwide, according to the Centers for Disease Control and Prevention and the World Health Organization. HSV-2 is a chronic, lifelong infection for which there is no cure. The virus persists in two states: inactive, or latent, and active. During latent states, patients have no symptoms or manifestations of disease. Intermittently, the virus activates, spreading to the skin and mucous membranes of the genital region. In active states, the virus can be detected by laboratory tests, and at these times the person is said to be shedding virus. Shedding lasts hours to several days or longer and is believed to be controlled eventually by the immune system. In general, when shedding is of short duration symptoms may not be present (so-called asymptomatic shedding). When shedding persists, ulcers may develop (clinical or symptomatic shedding). Sexual contact during either symptomatic or asymptomatic shedding events can lead to disease transmission. There is no known cure for HSV-2. For patients experiencing outbreaks, oral antiviral drugs are the only treatment option, but they are of limited effectiveness in reducing viral shedding, the risk of transmission from viral shedding and symptomatic outbreaks. We used ATLAS to design GEN-003 as a therapeutic vaccine, or immunotherapy, and are developing GEN-003 to treat people with HSV-2 infections.

In our Phase 1/2a trial, which followed patients for 12 months after their third vaccine dose, we have generated human proof-of-concept data in patients with moderate-to-severe infections. Final analysis of the data showed that for the best performing 30μg dose group, there was a sustained reduction in the viral shedding rate. After completion of dosing for this dose group, the viral shedding rate fell by 52% versus baseline and, at six months after the final dose, the shedding rate remained 40% below baseline. At 12 months, the viral shedding rate returned to baseline for this dose group. The reduction in the genital lesion rate after completion of the third dose was greatest for the 30μg dose group at 48%. After six months, the reduction from baseline in genital lesion rate for this dose group was 65% and after 12 months, the genital lesion rate was 42% lower than baseline. GEN-003 was safe and well tolerated over the 12 months of this trial.

We believe that these initial clinical trial results demonstrate that GEN-003 has the potential to be a first-in-class immunotherapy to treat HSV-2. These data also suggest that GEN-003 may become the first immunotherapy to effectively treat an infection that is controlled significantly by the T cell immune system. We expect to initiate a Phase 2 trial in mid-2014 to optimize the vaccine dose and potentially to improve upon either the magnitude and/or durability of the viral shedding and genital lesion rate reductions we have observed to date. This trial will study six combinations of protein and adjuvant doses and is designed around the 30μg per protein/50μg Matrix-M dose of GEN-003, which was the dose that drove the largest reductions in viral shedding and lesion rates in the Phase 1/2a trial.

Based on market research surveys conducted on our behalf with more than 400 patients with HSV-2 infections and more than 300 physicians who treat patients with HSV-2 infections, we believe that, if approved, GEN-003 could be used either as monotherapy or in combination with oral antiviral medication. We anticipate that, since the mechanisms of action for GEN-003 and oral antiviral medication may complement each other, the control against symptoms and disease transmission risk

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offered by the combination could exceed that of either therapy alone. We therefore believe GEN-003 can be an important treatment option for people infected with HSV-2.

GEN-004: A Prophylactic Vaccine Candidate for Pneumococcus

Our second program derived from ATLAS is GEN-004, a T cell vaccine that we are developing to protect against all strains of the bacteria pneumococcus. Pneumococcus is the most common cause of bacterial pneumonia in the world, and kills more children under age five globally than any other organism. Pneumococcus often resides harmlessly in the nose and throat, but can also spread to other parts of the body and cause disease. There are safe and effective vaccines that induce antibodies against pneumococcus, including Prevnar from Pfizer, which achieved global revenue of $4.0 billion in 2013. However, Prevnar and other available vaccines protect against only a small number of the more than 90 pneumococcus serotypes known to cause disease, meaning that a universal pneumococcus vaccine would address a significant unmet need.

We have designed GEN-004 as a potential universal vaccine to fight all serotypes of pneumococcus, and to do so through a T cell-based mechanism of action that complements existing vaccines. Using ATLAS, we have identified three protein antigens that associate highly with a protective T cell response against pneumococcus in humans. Moreover, as these proteins are conserved in all sequenced strains of pneumococci, we believe GEN-004 may be able to help protect against invasive disease caused by any pneumococcal serotype. We have demonstrated in mice that GEN-004 clears pneumococcus from the nose and throat through a T cell-mediated mechanism of action. We announced top line data in June 2014 from a Phase 1 clinical trial of GEN-004. This trial met its safety, tolerability and immunogenicity goals, including measurable increases in the blood of T helper 17 (T_H17) cells, a rare cell type that provides immunity at epithelial and mucosal surfaces. We plan to advance GEN-004 into a Phase 2a trial in the third quarter of 2014. If successful, we believe it could be the first clinical trial in which a vaccine induces a T cell response to reduce colonization by pneumococcus in the nasopharnyx, a necessary precursor to pneumococcal disease.

Other Opportunities

We have a number of other non-clinical stage research programs intended to address other areas of high unmet clinical need, all discovered using our ATLAS platform. Our chlamydia and HSV-2 prophylaxis programs have achieved promising non-clinical study results from candidates generated using ATLAS. We are collaborating with the Bill & Melinda Gates Foundation on malaria vaccine research. We also believe ATLAS may offer utility in the discovery of new treatments for cancer.

In March 2014, we announced a joint research collaboration with the Dana-Farber Cancer Institute and Harvard Medical School to characterize anti-tumor T cell responses in melanoma patients. This collaboration extends the use of our proprietary ATLAS platform for the potential rapid discovery of T cell antigens to cancer immunotherapy approaches.

Our Product Candidate Pipeline

The following table describes our current development programs:

Vaccine Candidate	Program	Stage of Development	Next Milestone	Anticipated Timeline
GEN-003	HSV-2 Therapeutic	Phase 2	Complete Phase 2 dose optimization	Mid-2015
GEN-004	Pneumococcus Prophylaxis	Phase 2a	Complete Phase 2a	Mid-2015
GEN-001	Chlamydia Prophylaxis	Pre-clinical	File IND	2017
GEN-002	HSV-2 Prophylaxis	Pre-clinical	File IND	2017
GEN-005	Malaria Prophylaxis	Research	Initiate pre-clinical studies	Second half of 2015

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Our Team

Our management and scientific teams possess considerable experience in vaccine and anti-infective research, manufacturing, clinical development and regulatory matters. We have also assembled a team of leading advisors, led by George Siber, M.D., to guide the further development of our programs. Previously, Dr. Siber was the Chief Scientific Officer of Wyeth Vaccines, where he led the development of several first-in-class vaccines including Prevnar. He is also an inventor of Respigam and Cytogam, antibodies to treat and protect against respiratory syncytial virus and cytomegalovirus, respectively. Dr. Siber is one of our directors and chairs our Scientific Advisory Board.

Our Strategy

Our objective is to be the leading T cell vaccine company. Key components of our strategy are to:

Continue to rapidly advance our lead vaccine candidate, GEN-003. GEN-003 is a potential first-in-class therapeutic vaccine candidate we are developing to treat HSV-2 infections, for which we have successfully completed a Phase 1/2a trial and expect to commence a Phase 2 dose optimization trial in mid-2014. We intend to commence a further Phase 2 trial in mid-2015 to optimize the dosing regimen. We retain all rights to GEN-003 and plan to advance this program through regulatory approval and commercialize this vaccine through a focused commercial effort in the United States. Outside the United States, we intend to evaluate partnerships for GEN-003 opportunistically.

Advance GEN-004 into human proof-of-concept clinical trials. Our second clinical-stage product candidate is GEN-004, a vaccine candidate designed to prevent infections caused by all strains of pneumococcus. We have demonstrated proof-of-concept of GEN-004 in mice. We announced positive top line data for our Phase 1 clinical trial in June 2014 and plan to commence our Phase 2a human proof-of-concept trial in the third quarter of 2014 with results from this trial expected to be available in mid-2015. We believe this trial could provide the first evidence in humans that a T cell vaccine, with the potential to become a universal vaccine, can reduce colonization by pneumococcus. We retain all rights to this program, other than certain rights we have granted in developing countries, and intend to opportunistically partner this program.

Advance our discovery stage and non-clinical novel vaccine programs. We expect similarly to advance our novel non-clinical prophylactic vaccine programs against chlamydia, HSV-2 and malaria through human proof-of-concept. We will seek partnerships opportunistically for late-stage development and commercialization of such programs. We will also continue to investigate, either alone, or through partnerships, the applicability of ATLAS to the development of cancer immunotherapies.

Utilize ATLAS, our vaccine discovery platform, to develop additional T cell vaccine candidates. We intend to continue to use ATLAS to discover and advance novel T cell vaccines. Since we begin our vaccine candidate discovery process by profiling human populations exposed to a pathogen, and use these subjects' own cells to comprehensively screen the entire proteome of the pathogen, we believe we have a better chance of identifying vaccines likely to protect against pathogens of interest. We intend to opportunistically expand our pipeline using ATLAS to discover T cell vaccines against pathogens for which B cell vaccines are ineffective or non-existent.

Risk Factors

An investment in our common stock involves a high degree of risk. These risks are discussed more fully in the "Risk Factors" section of this prospectus immediately following this prospectus summary and in our Annual Report on Form 10-K for the year ended December 31, 2013 and in our Quarterly

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Report on Form 10-Q for the quarter ended March 31, 2014, both of which are incorporated by reference herein. These risk factors include, among others:

- We have incurred significant losses since our founding in 2006, which we anticipate will continue for the foreseeable future. We have never generated revenue from product sales and may never generate revenue from product sales.
- Failure to obtain additional funding when needed would force us to delay, limit, reduce or terminate our development or commercialization efforts of our product candidates.
- Our product candidates, including GEN-003 and GEN-004, are designed to work by eliciting T cell responses, which is a novel approach for vaccines and medical treatments and therefore could produce unexpected adverse clinical outcomes or result in delays in our obtaining regulatory approval.
- If our product candidates fail to demonstrate safety and efficacy to the satisfaction of regulatory authorities we may incur additional costs or experience delays in completing, or ultimately be unable to complete, the development and commercialization of our product candidates.
- Our product candidates, including GEN-003, may include one or more novel vaccine adjuvants, which may make it difficult for us to predict the requirements the United States Food and Drug Administration, or FDA, or other regulatory agencies may impose to demonstrate the safety of the product candidate.
- We expect to rely on third parties to conduct the majority of our product manufacturing and clinical development of our product candidates. If they fail to meet deadlines or perform in an unsatisfactory manner, our business could be harmed.
- Our future commercial success depends upon attaining significant market acceptance of our product candidates, if approved, among patients, physicians, third-party payors and others in the medical community.
- 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.

Implications of Being an Emerging Growth Company

As a company with less than $1.0 billion in revenue during our most recently completed fiscal year, we qualify as an "emerging growth company" as defined in Section 2(a) of the Securities Act of 1933, as amended, which we refer to as the Securities Act, as modified by the Jumpstart Our Business Startups Act of 2012, or 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;
- no 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, including two years of audited financial information and two years of selected financial information.

We may take advantage of these exemptions for up to five years or such earlier time that we are no longer an emerging growth company. We would cease to be an emerging growth company if we have more than $1.0 billion in annual revenues as of the end of a fiscal year, have more than

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$700.0 million in market value of our capital stock held by non-affiliates or if we issue more than $1.0 billion of non-convertible debt over a three year period. 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. 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 public 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 Cambridge Discovery Park, 100 Acorn Park Drive, 5th Floor, Cambridge, Massachusetts 02140, and our telephone number is (617) 876-8191. Our Internet website is *www.genocea.com*. We have included our website address in this prospectus solely as an inactive textual reference. The information on, or that can be accessed through, our website is not part of this prospectus, and you should not rely on any such information in making the decision 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.

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THE OFFERING

Common stock offered by us	shares
Common stock to be outstanding immediately following this offering	shares
Option to purchase additional shares	The underwriters have an option for a period of 30 days to purchase up to additional shares of our common stock.
Use of proceeds	We currently estimate that we will use the net proceeds from this offering, together with our existing cash and cash equivalents and future available borrowings under our credit facility, (1) to further fund clinical development and manufacturing of GEN-003 into a Phase 3 clinical study, (2) to further fund clinical development and manufacturing of GEN-004, (3) to fund research and development and manufacturing of our prophylactic chlamydia, HSV-2 and malaria programs through filing of an investigational new drug, or IND, application and (4) for working capital and other general corporate purposes, including funding the costs of operating as a public company. See "Use of Proceeds".
Risk factors	You should read the "Risk Factors" section of this prospectus for a discussion of factors to consider carefully before deciding to invest in shares of our common stock.
NASDAQ Global Market symbol	GNCA

The number of shares of common stock to be outstanding after this offering is based on 17,393,887 shares of common stock outstanding at June 30, 2014 and excludes the following:

- 2,246,857 shares of common stock issuable upon exercise of stock options outstanding at June 30, 2014 at a weighted-average exercise price of $6.66 per share;
- 3,878 shares of common stock issuable upon the exercise of warrants outstanding at June 30, 2014 at a weighted-average exercise price of $7.74 per share;
- 2,613,887 shares of common stock reserved for future issuance under our 2014 Equity Incentive Plan, which was adopted in January 2014; and
- 200,776 shares of common stock reserved for future issuance under our 2014 Employee Stock Purchase Plan, which was adopted in January 2014.

Unless otherwise indicated, all information in this prospectus reflects or assumes no issuance or exercise of stock options or warrants on or after June 30, 2014 and no exercise by the underwriters of their option to purchase up to an additional shares of common stock in this offering.

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SUMMARY FINANCIAL DATA

The following summary financial data for the years ended December 31, 2012 and 2013 are derived from our audited financial statements incorporated by reference in this prospectus from our Annual Report on Form 10-K for the year ended December 31, 2013. The summary financial data as of March 31, 2014 and for the three months ended March 31, 2013 and 2014 have been derived from our unaudited financial statements incorporated by reference in this prospectus from our Quarterly Report on Form 10-Q for the quarter ended March 31, 2014. These unaudited financial statements have been prepared on a basis consistent with our audited financial statements and, in our opinion, contain all adjustments, consisting only of normal and recurring adjustments, necessary for a fair presentation of such financial data. You should read this data together with our financial statements and related notes and the information under the captions "Selected Financial Data" and "Management's Discussion and Analysis of Financial Condition and Results of Operations" incorporated by reference in this prospectus. For more details on how you can obtain the documents incorporated by reference in this prospectus, see "Where You Can Find More Information" and "Incorporation of Documents By Reference" appearing elsewhere in this prospectus. Our historical results are not necessarily indicative of our future results, and our operating results for the three months ended March 31, 2014 are not necessarily indicative of the results that may be expected for the year ending December 31, 2014 or any other interim periods or any future year or period.

	Year Ended December 31,		Three Months Ended March 31,	
(in thousands, except per share data)	**2012**	**2013**	**2013**	**2014**
Statement of Operations Data:				
Grant revenue	$ 1,977	$ 731	$ 259	$
Operating expenses:				
Research and development	11,240	15,695	3,980	4,407
General and administrative	3,690	4,961	810	1,966
Total operating expenses	14,930	20,656	4,790	6,373
Loss from operations	(12,953)	(19,925)	(4,531)	(6,373)
Other income (expense):				
Change in fair value of warrant	93	(222)	(6)	(725)
Loss on debt extinguishment		(200)		
Interest expense, net	(507)	(459)	(127)	(231)
Other expense	(414)	(881)	(133)	(956)
Net loss	$ (13,367)	$ (20,806)	$ (4,664)	$ (7,329)