UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, DC 20549

FORM 10-Q

x **QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the quarterly period ended March 31, 2020

OR

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from to
Commission File Number: 001-36289

Genocea Biosciences, Inc.
(Exact Name of Registrant as Specified in Its Charter)

Delaware	**51-0596811**
(State or Other Jurisdiction of Incorporation or Organization)	(IRS Employer Identification No.)
100 Acorn Park Drive	
Cambridge, Massachusetts	**02140**
(Address of Principal Executive Offices)	(Zip Code)

Registrant's Telephone Number, Including Area Code: (617) 876-8191

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading symbol(s)	Name of each exchange on which registered
Common stock, $0.001 par value per share	GNCA	NASDAQ Capital Market

Indicate by check mark whether the registrant: (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. **Yes** x **No** ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). **Yes** x **No** ☐

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. (Check one):

Large accelerated filer	☐	Accelerated filer	x
Non-accelerated filer	☐	Smaller reporting company	x
		Emerging growth company	☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). **Yes** ☐ **No** x

As of April 28, 2020 , there were 27,643,773 shares of the registrant's Common Stock, par value $0.001 per share, outstanding.

FORWARD-LOOKING STATEMENTS

This Quarterly Report on Form 10-Q contains forward-looking statements that involve substantial risks and uncertainties. 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.

Any forward-looking statements in this Quarterly Report on Form 10-Q reflect our current views with respect to future events or to our future financial performance and involve known and unknown risks, uncertainties and other factors that may cause our actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by these forward-looking statements. Factors that may cause actual results to differ materially from current expectations include, among other things, those listed in our Annual Report on Form 10-K and other filings with the Securities Exchange Commission (the “SEC”), including the following:

- our estimates regarding the timing and amount of funds we require to conduct clinical trials for GEN-009, to continue preclinical studies and file an investigational new drug (“IND”) for GEN-011, to continue preclinical studies 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 availability of materials and equipment, and the potential disruptions in supply chains resulting from the international public health emergency associated with the novel coronavirus (COVID-19);
- 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 strategies.

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. Except as required by law, we assume no obligation to update or revise these forward-looking statements for any reason, even if new information becomes available in the future.

This Quarterly Report on Form 10-Q includes 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.

Genocea Biosciences, Inc.
Form 10-Q
For the Quarter Ended March 31, 2020

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PART I. FINANCIAL INFORMATION
Item 1. Financial Statements

Genocea Biosciences, Inc.
Condensed Consolidated Balance Sheets
(unaudited)
(in thousands)

	March 31, 2020	December 31, 2019
Assets		
Current assets:		
Cash and cash equivalents	$ 26,509	$ 40,127
Prepaid expenses and other current assets	2,562	1,457
Total current assets	29,071	41,584
Property and equipment, net	2,474	2,617
Right of use assets	11,782	6,306
Restricted cash	631	631
Other non-current assets	1,234	1,473
Total assets	$ 45,192	$ 52,611
Liabilities and stockholders' equity		
Current liabilities:		
Accounts payable	$ 860	$ 553
Accrued expenses and other current liabilities	4,077	4,611
Lease liabilities	2,028	1,117
Current portion of long-term debt	7,700	—
Total current liabilities	14,665	6,281
Non-current liabilities:		
Long-term debt, net of current portion	5,815	13,407
Warrant liability	1,705	2,486
Lease liabilities, net of current portion	9,994	5,395
Total liabilities	32,179	27,569
Commitments and contingencies (Note 5)		
Stockholders' equity:		
Preferred stock, $0.001 par value; (shares authorized of 25,000,000 at March 31, 2020 and December 31, 2019; 1,635 shares issued and outstanding at March 31, 2020 and December 31, 2019)	701	701
Common stock, $0.001 par value; (shares authorized of 85,000,000 at March 31, 2020 and December 31, 2019, 27,643,773 shares issued and outstanding at March 31, 2020 and 27,452,900 shares issued and outstanding at December 31, 2019)	28	27
Additional paid-in capital	356,091	355,268
Accumulated deficit	(343,807)	(330,954)
Total stockholders' equity	13,013	25,042
Total liabilities and stockholders' equity	$ 45,192	$ 52,611

See accompanying notes to unaudited condensed consolidated financial statements.

Genocea Biosciences, Inc.
Condensed Consolidated Statements of Operations and Comprehensive Loss
(unaudited)
(in thousands, except per share data)

	Three Months Ended March 31,	
	2020	**2019**
Operating expenses:		
Research and development	$ 9,987	$ 6,460
General and administrative	3,388	3,017
Total operating expenses	13,375	9,477
Loss from operations	(13,375)	(9,477)
Other income (expense):		
Change in fair value of warrants	781	(5,787)
Interest expense, net	(259)	(302)
Other income (expense)	—	(1)
Total other income (expense)	522	(6,090)
Net loss	$ (12,853)	$ (15,567)
Comprehensive loss	$ (12,853)	$ (15,567)
Net loss per share - basic and diluted	$ (0.46)	$ (1.22)
Weighted-average number of common shares used in computing net loss per share	28,141	12,713

See accompanying notes to unaudited condensed consolidated financial statements.

Genocea Biosciences, Inc.
Condensed Consolidated Statements of Stockholders' Equity
(unaudited)
(in thousands)

	Common Shares		Preferred Shares Amount	Additional Paid-In Capital	Accumulated Deficit	Total Stockholders' Equity
	Shares	Amount				
Balance at December 31, 2019	27,453	$ 27	$ 701	$ 355,268	$ (330,954)	$ 25,042
Issuance of common stock, net	187	1	—	439	—	440
Stock-based compensation expense	—	—	—	384	—	384
Issuance of common stock under employee benefit plans	4	—	—	—	—	—
Net loss	—	—	—	—	(12,853)	(12,853)
Balance at March 31, 2020	27,644	$ 28	$ 701	$ 356,091	$ (343,807)	$ 13,013

	Common Shares		Preferred Shares Amount	Additional Paid-In Capital	Accumulated Deficit	Total Stockholders' Equity
	Shares	Amount				
Balance at December 31, 2018	10,847	$ 11	$ 701	$ 298,627	$ (292,004)	$ 7,335
Issuance of common stock, net	3,200	3	—	14,023	—	14,026
Exercise of stock options	3	—	—	12	—	12
Stock-based compensation expense	—	—	—	429	—	429
Net loss	—	—	—	—	(15,567)	(15,567)
Balance at March 31, 2019	14,050	$ 14	$ 701	$ 313,091	$ (307,571)	$ 6,235

See accompanying notes to unaudited condensed consolidated financial statements.

Genocea Biosciences, Inc.
Condensed Consolidated Statements of Cash Flows
(unaudited)
(in thousands)

	Three Months Ended March 31,	
	2020	**2019**
Operating activities		
Net loss	$ (12,853)	$ (15,567)
Adjustments to reconcile net loss to net cash used in operating activities		
Depreciation and amortization	276	272
Stock-based compensation	384	429
Change in fair value of warrant liability	(781)	5,787
Gain on sale of equipment	(13)	—
Non-cash interest expense	109	162
Asset impairment	97	—
Changes in operating assets and liabilities	(1,015)	(1,382)
Net cash used in operating activities	(13,796)	(10,299)
Investing activities		
Purchases of property and equipment	(233)	(221)
Proceeds from sale of equipment	16	—
Net cash used in investing activities	(217)	(221)
Financing activities		
Proceeds from issuance of common stock, net	440	—
Payments on finance lease	(45)	—
Proceeds from equity offerings, net of issuance costs	—	14,026
Repayment of long-term debt	—	(841)
Proceeds from exercise of stock options	—	12
Net cash provided by financing activities	395	13,197
Net (decrease) increase in cash, cash equivalents and restricted cash	$ (13,618)	$ 2,677
Cash, cash equivalents and restricted cash at beginning of period	40,758	26,677
Cash, cash equivalents and restricted cash at end of period	$ 27,140	$ 29,354
Non-cash financing activities and supplemental cash flow information		
Right-of-use asset obtained in exchange for lease liabilities	$ 5,931	$ 1,686
Cash paid in connection with operating lease liabilities	$ 394	$ 406
Cash paid for interest	$ 261	$ 289

See accompanying notes to unaudited condensed consolidated financial statements.

1. Organization and operations

The Company

Genocea Biosciences, Inc. (the "Company") is a biopharmaceutical company that was incorporated in Delaware on August 16, 2006 and has a principal place of business in Cambridge, Massachusetts. The Company seeks to discover and develop novel cancer immunotherapies using its 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. The Company believes that this approach optimizes antigen selection for immunotherapies such as cancer vaccines and cellular therapies. Consequently, the Company believes that ATLAS could lead to more immunogenic and efficacious cancer immunotherapies.

The Company's most advanced program is GEN-009, a personalized neoantigen cancer vaccine, for which it is 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. The Company is also advancing GEN-011, a neoantigen-specific adoptive T cell therapy program that also relies on ATLAS, and expects to file an IND in the second quarter of 2020.

The Company is devoting substantially all of its efforts to product research and development, initial market development, and raising capital. The Company has not generated any product revenue related to its primary business purpose to date and is subject to a number of risks and uncertainties common to companies in the biotech and pharmaceutical industry, including, but not limited to, the risks associated with the uncertainty of success of its preclinical and clinical trials; the challenges associated with gaining regulatory approval of product candidates; the risks associated with commercializing pharmaceutical products, if approved for marketing and sale; the potential for development by third parties of new technological innovations that may compete with the Company's products; the dependence on key personnel; the challenges of protecting proprietary technology; the need to comply with government regulations; the high cost of drug development; compliance with government regulations, competition from other companies; the uncertainty of being able to secure additional capital when needed to fund operations; and the challenges and uncertainty associated with the recent outbreak of the coronavirus, or referred to as COVID-19, that have arisen in the global economy, that could adversely impact the Company's operations, supply chain, preclinical development work, clinical trials and ability to raise capital.

Accounting Standards Update ("ASU"), 2014-15, *Presentation of Financial Statements-Going Concern (Subtopic 205-40)* , also referred to as Accounting Standards Codification ("ASC") 205-40 ("ASC 205-40"), requires the Company to evaluate whether conditions and/or events raise substantial doubt about its ability to meet its future financial obligations as they become due within one year after the financial statements are issued. As of March 31, 2020 , the Company had an accumulated deficit of $343.8 million and anticipates that it will continue to incur significant operating losses for the foreseeable future as it continues to develop its product candidates. Until such time, if ever, as the Company can generate substantial product revenue and achieve profitability, the Company expects to finance its cash needs through a combination of equity offerings, strategic transactions, and other sources of funding. If the Company is unable to raise additional funds when needed, the Company may be required to implement further cost reduction strategies, including ceasing development of GEN-009, GEN-011, or other corporate programs and activities.

As reflected in the consolidated financial statements, the Company had available cash and cash equivalents of $26.5 million at March 31, 2020 . In addition, the Company had cash used in operating activities of $13.8 million for the three months ended March 31, 2020 . These factors, combined with the Company's forecast of cash required to fund operations for a period of at least one year from the date of issuance of these consolidated financial statements, raise substantial doubt about the Company's ability to continue as a going concern.

The accompanying consolidated financial statements have been prepared on a going concern basis, which contemplates the realization of assets and satisfaction of liabilities in the ordinary course of business. The consolidated financial statements do not include any adjustments relating to the recoverability and classification of recorded asset amounts or the amounts and classification of liabilities that might result from the outcome of this uncertainty.

2. Summary of significant accounting policies

The following is a summary of significant accounting policies followed in the preparation of these condensed consolidated financial statements.

The information included in this Quarterly Report on Form 10-Q should be read in conjunction with the Company's audited consolidated financial statements and the accompanying notes included in the Company's Annual Report on Form 10-K for the year ended December 31, 2019 (“ 2019 Form 10-K”). The Company's accounting policies are described in the “Notes to Consolidated Financial Statements” in the Company's 2019 Form 10-K and updated, as necessary, in the Company's Quarterly Reports on Form 10-Q. The December 31, 2019 condensed consolidated balance sheet data presented for comparative purposes were derived from the Company's audited financial statements but do not include all disclosures required by U.S. GAAP. The results of operations for the three months ended March 31, 2020 are not necessarily indicative of the operating results for the full year or for any other subsequent interim period.

Basis of presentation

The accompanying unaudited condensed consolidated financial statements include those accounts of the Company and a wholly owned subsidiary after elimination of all intercompany accounts and transactions. The Company operates as one segment, which is discovering, researching, developing and commercializing novel cancer immunotherapies.

Use of estimates

The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the amounts reported in the financial statements and accompanying notes. On an ongoing basis, the Company’s management evaluates its estimates, which include, but are not limited to, estimates related to clinical trial accruals, estimates related to prepaid and accrued research and development expenses, stock-based compensation expense, and warrants to purchase redeemable securities. The Company bases its estimates on historical experience and other market-specific or other relevant assumptions that it believes to be reasonable under the circumstances. Actual results may differ from those estimates or assumptions.

Significant accounting policies

There were no changes to significant accounting policies during the three months ended March 31, 2020 , as compared to the those disclosed in the 2019 Form 10-K.

New Accounting Pronouncements

The following new accounting pronouncements were adopted by the Company on January 1, 2020:

In 2016, the Financial Accounting Standards Board (“FASB”) issued ASU 2016-13, *Financial Instruments-Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments* (“ASU 2016-13”), which amends the impairment model by requiring entities to use a forward-looking approach based on expected losses to estimate credit losses on certain types of financial instruments, including trade receivables and available-for-sale debt securities. The Company early adopted the standard on January 1, 2020. Based on the composition of the Company's investment portfolio, which includes only money market funds, and the insignificance of the Company's other financial assets, current market conditions, and historical credit loss activity, the adoption of this standard did not have a material impact on the Company's consolidated financial statements and related disclosures.

In 2018, the FASB issued ASU 2018-13, *Fair Value Measurement (Topic 820): Disclosure Framework – Changes to the Disclosure Requirements for Fair Value Measurement* (“ASU 2018-13”). The new standard requires public entities to disclose certain new information and modifies some disclosure requirements. The Company adopted the standard on the required effective date of January 1, 2020. This standard did not have a material impact on the Company's disclosures.

In 2018, the FASB issued ASU 2018-15, *Intangibles-Goodwill and Other-Internal-Use Software (Subtopic 350-40)* : *Customer’s Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract* (“ASU 2018-15”). ASU 2018-15 requires a customer in a cloud computing arrangement that is a service contract to follow the internal-use software guidance in Accounting Standards Codification 350-40 to determine which implementation costs to defer and recognize as an asset. The Company adopted the standard on the required effective date of January 1, 2020. This standard did not have a material impact on the Company's consolidated financial statements and related disclosures.

The following new accounting pronouncements have been issued but are not yet effective:

In 2019, the FASB issued ASU 2019-12, *Income Taxes (Topic 740): Simplifying the Accounting for Income Taxes* ("ASU 2019-12"). ASU 2019-12 simplifies the accounting for income taxes and will be effective beginning after December 15, 2020. The Company is currently evaluating the impact of ASU 2019-12 in the consolidated financial statements, including accounting policies, processes, and systems.

Other accounting standards that have been issued or proposed by the FASB or other standards-setting bodies that do not require adoption until a future date are not expected to have a material impact on the Company's consolidated financial statements upon adoption.

3. Fair value of financial instruments

The Company has certain financial assets and liabilities recorded at fair value which have been classified as Level 1, 2 or 3 within the fair value hierarchy as described in the accounting standards for fair value measurements.

- Level 1—Fair values are determined by utilizing quoted prices (unadjusted) in active markets for identical assets or liabilities that the Company has the ability to access;
- Level 2—Fair values are determined by utilizing quoted prices for similar assets and liabilities in active markets or other market observable inputs such as interest rates, yield curves and foreign currency spot rates; and
- Level 3—Prices or valuations that require inputs that are both significant to the fair value measurement and unobservable.

The Company's financial assets consist of cash equivalents and the Company's financial liabilities consist of a warrant liability.

The fair value of the Company's cash equivalents is determined using quoted prices in active markets. The Company's cash equivalents consist of money market funds that are classified as Level 1.

The fair value of the Company's warrant liability is determined using a Monte Carlo simulation. See **Note 8. Warrants** for assumptions used and methodologies utilized in calculating the estimated fair value. The Company's warrant liability is classified as Level 3.

The following table sets forth the Company's assets and liabilities that are measured at fair value on a recurring basis as of March 31, 2020 and December 31, 2019 (in thousands):

	Total	Quoted prices in active markets (Level 1)	Significant other observable inputs (Level 2)	Significant unobservable inputs (Level 3)
March 31, 2020				
Assets:				
Cash equivalents	$ 25,985	$ 25,985	$ —	$ —
Total assets	$ 25,985	$ 25,985	$ —	$ —
Liabilities:				
Warrant liability	$ 1,705	$ —	$ —	$ 1,705
Total liabilities	$ 1,705	$ —	$ —	$ 1,705
December 31, 2019				
Assets:				
Cash equivalents	$ 39,971	$ 39,971	$ —	$ —
Total assets	$ 39,971	$ 39,971	$ —	$ —
Liabilities:				
Warrant liability	$ 2,486	$ —	$ —	$ 2,486
Total liabilities	$ 2,486	$ —	$ —	$ 2,486

The following table reflects the change in the Company's Level 3 warrant liability (in thousands):

	Warrant Liability
Balance at December 31, 2019	$ 2,486
Change in fair value	(781)
Balance at March 31, 2020	$ 1,705

4. Accrued expenses and other current liabilities

Accrued expenses and other current liabilities consisted of the following (in thousands):

	March 31, 2020	December 31, 2019
Research and development costs	$ 2,507	$ 1,607
Payroll and employee-related costs	730	2,245
Other current liabilities	840	759
Total	$ 4,077	$ 4,611

5. Commitments and contingencies

Operating leases

As of March 31, 2020 , the Company has leases for three floors of lab and office space in a multi-tenant building in Cambridge, Massachusetts.

In July 2019, the Company exercised an option for additional office and lab space from March 2020 through February 2025. The Company's right to use and control the space began in March 2020. As a result of the Company's right to use and control the space, the Company recognized an increase in the right of use ("ROU") assets of $5.9 million and associated lease liabilities of $5.8 million in March 2020. The Company has the option to extend the lease term for an additional five years , which is not included in the Company's ROU assets and associated lease liabilities as of March 31, 2020 .

In May 2019, the Company entered into a lease extension for office and lab space through February 2025. As a result of the lease term extension, the Company recognized an increase in the ROU assets of $5.4 million and associated lease liabilities of $5.3 million . The associated lease obligation for the extension is included in the Company's ROU assets and associated lease liabilities as of March 31, 2020 . The Company has the option to extend the lease terms for an additional five years , which is not included in the Company's ROU assets and associated lease liabilities as of March 31, 2020 .

For the three months ended March 31, 2020 and 2019 lease expense, net of sublease income, was $0.5 million and $0.4 million , respectively.

The weighted average remaining lease term and weighted average discount rate of the Company's operating leases are as follows:

	March 31, 2020	March 31, 2019
Weighted average remaining lease term in years	4.92	0.92
Weighted average discount rate	8.13%	10.00%

Finance lease

In December 2019, the Company entered into an agreement to lease lab equipment for a term of 15 months. The Company determined that the agreement qualifies as a finance lease based on the criteria that the Company holds the option to purchase the asset and is reasonably certain to exercise at the end of the lease term. The ROU asset and lease liability were calculated using an incremental borrowing rate of 7.95% . Lease payments on this lease began in January 2020.

The following table summarizes the presentation in the Company's consolidated balance sheets:

Leases (in thousands)	Classification	March 31, 2020	December 31, 2019
Assets			
Operating	Lease ROU asset	$ 11,663	$ 6,156
Finance	Lease ROU asset	119	150
Total lease assets		$ 11,782	$ 6,306
Liabilities			
Current			
Operating	Lease liabilities	$ 1,921	$ 990
Finance	Lease liabilities	107	127
Non-current			
Operating	Lease liabilities, net of current portion	9,994	5,373
Finance	Lease liabilities, net of current portion	—	22
Total lease liabilities		$ 12,022	$ 6,512

The minimum lease payments related to the Company's operating and finance leases in accordance with ASC 842 as of March 31, 2020 were as follows (in thousands):

	Operating leases	Finance lease	Total
2020	$ 2,110	$ 89	$ 2,199
2021	2,871	23	2,894
2022	2,943	—	2,943
2023	3,017	—	3,017
2024 and thereafter	3,609	—	3,609
Total lease payments	$ 14,550	$ 112	$ 14,662
Less imputed interest	(2,635)	(5)	(2,640)
Total	$ 11,915	$ 107	$ 12,022

At March 31, 2020 and December 31, 2019 , the Company has an outstanding letter of credit of $0.6 million , with a financial institution related to a security deposit for the office and lab space lease, which is secured by cash on deposit and expires on February 28, 2025.

Contractual obligations

The Company has entered into certain agreements with various contract research organizations (“CROs”) and contract manufacturing organizations (“CMOs”), which generally include cancellation clauses.

Harvard University License Agreement

The Company has an exclusive license agreement with Harvard University (“Harvard”), granting the Company an exclusive, worldwide, royalty-bearing, sublicensable license to three patent families, to develop, make, have made, use, market, offer for sale, sell, have sold and import licensed products and to perform licensed services related to the ATLAS discovery platform. The Company is also obligated to pay Harvard milestone payments up to $1.6 million in the aggregate upon the achievement of certain development and regulatory milestones. As of March 31, 2020 , the Company has paid $0.3 million in aggregate milestone payments. The Company is obligated under this license agreement to use commercially reasonable efforts to develop, market and sell licensed products in compliance with an agreed upon development plan. In addition, the Company is obligated to achieve specified development milestones and in the event the Company is unable to meet its development milestones for any type of product or service, absent any reasonable proposed extension or amendment thereof, Harvard has the right, depending on the type of product or service, to terminate this agreement with respect to such products or to convert the license to a non-exclusive, non-sublicensable license with respect to such products and services.

Upon commercialization of our products covered by the licensed patent rights or discovered using the licensed methods, the Company is obligated to pay Harvard royalties on the net sales of such products and services sold by the Company, the Company's

affiliates, and the Company's sublicensees. This royalty varies depending on the type of product or service but is in the low single digits. The sales-based royalty due by the Company's sublicensees is the greater of the applicable royalty rate or a percentage in the high single digits or the low double digits of the royalties the Company receives from such sublicensee, depending on the type of product. Based on the type of commercialized product or service, royalties are payable until the expiration of the last-to-expire valid claim under the licensed patent rights or for a period of 10 years from first commercial sale of such product or service. The royalties payable to Harvard are subject to reduction, capped at a specified percentage, for any third-party payments required to be made. In addition to the royalty payments, if the Company receives any additional revenue (cash or non-cash) under any sublicense, the Company must pay Harvard a percentage of such revenue, excluding certain categories of payments, varying from the low single digits to up to the low double digits depending on the scope of the license that includes the sublicense.

This license agreement with Harvard will expire on a product-by-product or service-by-service and country-by-country basis until the expiration of the last-to-expire valid claim under the licensed patent rights. The Company may terminate the agreement at any time by giving Harvard advance written notice. Harvard may also terminate the agreement in the event of a material breach by the Company that remains uncured; in the event of our insolvency, bankruptcy, or similar circumstances; or if the Company challenges the validity of any patents licensed to us.

Oncovir License and Supply Agreement

In January 2018, the Company entered into a License and Supply Agreement with Oncovir, Inc. ("Oncovir"). The agreement provides the terms and conditions under which Oncovir will manufacture and supply an immunomodulator and vaccine adjuvant, Hiltonol® (poly-ICLC) ("Hiltonol"), to the Company for use in connection with the research, development, use, sale, manufacture, commercialization and marketing of products combining Hiltonol with the Company's technology (the "Combination Product"). Hiltonol is the adjuvant component of GEN-009, which will consist of synthetic long peptides or neoantigens identified using the Company's proprietary ATLAS platform, formulated with Hiltonol.

Oncovir granted the Company a non-exclusive, assignable, royalty-bearing worldwide license, with the right to grant sublicenses through one tier, to certain of Oncovir's intellectual property in connection with the research, development, or commercialization of Combination Products, including the use of Hiltonol, but not the use of Hiltonol for manufacturing or the use or sale of Hiltonol alone. The license will become perpetual, fully paid-up, and royalty-free on the later of January 25, 2028 or the date on which the last valid claim of any patent licensed to the Company under the agreement expires.

Under this agreement, the Company is obligated to pay Oncovir low to mid six figure milestone payments upon the achievement of certain clinical trial milestones for each Combination Product and the first marketing approval for each Combination Product in certain territories, as well as tiered royalties in the low-single digits on a product-by-product basis based on the net sales of Combination Products.

The Company may terminate the agreement upon a decision to discontinue the development of the Combination Product or upon a determination by the Company or an applicable regulatory authority that Hiltonol or a Combination Product is not clinically safe or effective. The agreement may also be terminated by either party due to a material uncured breach by the other party, or due to the other party's bankruptcy, insolvency, or dissolution.

6. Long-term debt

In April 2018, the Company entered into an amended and restated loan and security agreement with Hercules Capital, Inc.("Hercules"), which was subsequently amended in November 2019 (as amended, the "2018 Term Loan"). The 2018 Term Loan provides a $14.0 million term loan. The 2018 Term Loan matures on May 1, 2021 and accrues interest at a floating rate per annum equal to the greater of (i) 8.00% , or (ii) the sum of 3.00% plus the prime rate. The 2018 Loan Agreement provides for interest-only payments until January 1, 2021. Thereafter, payments will include equal installments of principal and interest through maturity. The 2018 Term Loan may be prepaid subject to a prepayment charge. The Company is obligated to pay an additional end of term charge of $1.0 million at maturity.

The 2018 Term Loan is secured by a lien on substantially all assets of the Company, other than intellectual property. Hercules has a perfected first-priority security interest in certain cash, cash equivalents and investment accounts. The 2018 Term Loan contains non-financial covenants, representations and a Material Adverse Effect provision, as defined herein. There are no financial covenants. A "Material Adverse Effect" means a material adverse effect upon: (i) the business, operations, properties, assets or condition (financial or otherwise) of the Company; (ii) the ability of the Company to perform the secured obligations in accordance with the terms of the loan documents, or the ability of agent or lender to enforce any of its rights or remedies with respect to the secured obligations; or (iii) the collateral or agent's liens on the collateral or the priority of such liens. Any event that has a Material Adverse Effect or would reasonably be expected to have a Material Adverse Effect is an event of default under the Loan Agreement and repayment of amounts

due under the Loan Agreement may be accelerated by Hercules under the same terms as an event of default. As of March 31, 2020 , the Company was in compliance with all covenants of the 2018 Term Loan. The 2018 Term Loan is automatically redeemable upon a change in control. The Company believes acceleration of the repayment of amounts outstanding under the loan is remote, and therefore, the debt balance is classified according to the contractual payment terms at March 31, 2020 .

In connection with the 2018 Term Loan, the Company issued common stock warrants to Hercules (the "Hercules Warrant"). See **Note 8. Warrants** .

As of March 31, 2020 and December 31, 2019 , the Company had outstanding borrowings of $13.5 million and $13.4 million , respectively. Interest expense was $0.4 million for each of the three months ended March 31, 2020 and 2019 .

Future principal payments, including the End of Term Charges, are as follows (in thousands):

	March 31, 2020
2020	$ —
2021	13,960
Total	$ 13,960

7. Stockholders' equity

Agreement with Lincoln Park Capital

In October 2019 , the Company entered into a purchase agreement with Lincoln Park Capital ("LPC") pursuant to which LPC purchased $2.5 million of shares of the Company's common stock at a purchase price of $2.587 per share. In addition, for a period of thirty months, the Company has the right, at its sole discretion, to sell up to an additional $27.5 million of the Company's common stock based on prevailing market prices of its common stock at the time of each sale. In consideration for entering into the purchase agreement, the Company issued 289,966 shares of its common stock to LPC as a commitment fee. The purchase agreement limits the Company's sales of shares of common stock to LPC to 5,227,323 shares of common stock, representing 19.99% of the shares of common stock outstanding on the date of the purchase agreement. The purchase agreement also prohibits the Company from directing LPC to purchase any shares of common stock if those shares, when aggregated with all other shares of the Company's common stock then beneficially owned by LPC and its affiliates, would result in LPC and its affiliates having beneficial ownership, at any single point in time, of more than 9.99% of the then total outstanding shares of the Company's common stock.

In January 2020, the Company sold 186,986 shares of common stock to LPC, and received net proceeds of approximately $0.4 million .

2019 Public Offering

In June 2019, the Company entered into an underwriting agreement relating to the public offering of 10,500,000 shares of the Company's common stock, at a price of $3.50 per share, for gross proceeds of approximately $36.8 million (the "2019 Public Offering"). The Company also granted the underwriters an option to purchase up to an additional 1,575,000 shares of common stock ("Overallotment Option"). On June 26, 2019, the underwriters exercised this option in full. The Company received approximately $5.5 million in gross proceeds from the underwriter's exercise of the Overallotment Option. In connection with the 2019 Public Offering, inclusive of the Overallotment Option, the Company received net proceeds of $38.4 million .

Private Placement

In February 2019, the Company completed a private placement financing transaction (the "Private Placement"). The Company issued 3,199,998 shares of common stock, prefunded warrants (the "Pre-Funded Warrants") to purchase 531,250 shares of common stock (the "Pre-Funded Warrant Shares"), and warrants (the "Private Placement Warrants") to purchase up to 932,812 shares of common stock (the "Warrant Shares"). The shares, Pre-Funded Warrants and Private Placement Warrants (collectively, the "Units") were sold at a purchase price of $4.02 per Unit. The Company received net cash proceeds of approximately $13.8 million for the purchase of the shares, Pre-Funded Warrant Shares and Warrant Shares. See **Note 8. Warrants** .

The Company had the option to issue additional shares of common stock in a second closing (the "Second Closing") for gross proceeds of up to $24.2 million . The occurrence of the Second Closing was conditioned on top-line results from Part A of the Company's Phase 1/2a clinical trial for GEN-009 and a decision by the Company's board of directors to proceed with the Second

Closing. In June 2019, the Company announced top-line results from this trial but elected not to proceed with the Second Closing. In lieu of the Second Closing, the Company proceeded with the 2019 Public Offering.

At-the-market equity offering program

In 2015, the Company entered into an agreement, as amended, with Cowen and Company, LLC to establish an at-the-market equity offering program ("ATM") pursuant to which it was able to offer and sell shares of its common stock at prevailing market prices from time to time. Through March 31, 2020 , the Company has sold an aggregate of 463,887 shares under the ATM and received approximately $4.0 million in net proceeds.

8. Warrants

As of March 31, 2020 , the Company had the following potentially issuable shares of common stock related to unexercised warrants outstanding:

	Shares	Exercise price	Expiration date	Classification
Hercules Warrant	41,177	$ 6.80	Q2 2023	Equity
2018 Public Offering Warrants	3,616,944	$ 9.60	Q1 2023	Liability
Private Placement Warrants	932,812	$ 4.52	Q1 2024	Equity
Pre-Funded Warrants	531,250	$ 0.08	Q1 2039	Equity
	5,122,183			

Hercules Warrant

The exercise price and the number of shares are subject to adjustment upon a merger event, reclassification of the shares of common stock, subdivision or combination of the shares of common stock or certain dividends payments. The Company determined that the Hercules Warrant should be equity classified in accordance with ASC 480, *Distinguishing Liabilities from Equity* ("ASC 480") for all periods presented.

2018 Public Offering Warrants

In January 2018, the Company entered into two underwriting agreements, the first relating to the public offering of 6,670,625 shares of the Company's common stock, par value $0.001 per share, and accompanying warrants to purchase up to 3,335,313 shares of common stock ("2018 Public Offering Warrants"). The exercise price and the number of shares are subject to adjustment upon a merger event, reclassification of the shares of common stock, subdivision or combination of the shares of common stock or certain dividends payments. In the event of an "Acquisition," defined generally to include a merger or consolidation resulting in the sale of 50% or more of the voting securities of the Company, the sale of all, or substantially all, of the assets or voting securities of the Company, or other change of control transaction, as defined in the 2018 Public Offering Warrants, the Company will be obligated to use its best efforts to ensure that the holders of the 2018 Public Offering Warrants receive new warrants from the surviving or acquiring entity (the "Acquirer"). The new warrants to purchase shares in the Acquirer shall have the same expiration date as the 2018 Public Offering Warrants and a strike price that is based on the proportion of the value of the Acquirer's stock to the Company's common stock. If the Company is unable, despite its best efforts, to cause the Acquirer to issue new warrants in the Acquisition as described above, then, if the Company's stockholders are to receive cash in the Acquisition, the Company will settle the 2018 Public Offering Warrants in cash and if the Company's stockholders are to receive stock in the Acquisition, the Company will issue shares of its common stock to each Warrant holder.

The Company determined that the 2018 Public Offering Warrants should be liability classified in accordance with ASC 480. As the 2018 Public Offering Warrants are liability-classified, the Company remeasures the fair value at each reporting date. The Company initially recorded the 2018 Public Offering Warrants at their estimated fair value of approximately $18.2 million . In connection with the Company's remeasurement of the 2018 Public Offering Warrants to fair value, the Company recorded income of approximately $0.8 million and expense of approximately $5.8 million for the three months ended March 31, 2020 and 2019 , respectively. The fair value of the warrant liability is approximately $1.7 million and $2.5 million as of March 31, 2020 and December 31, 2019 , respectively.

The following table details the assumptions used in the Monte Carlo simulation models used to estimate the fair value of the Warrant Liability as of March 31, 2020 and December 31, 2019 , respectively:

	March 31, 2020	December 31, 2019
Stock price	$ 1.72	$ 2.07
Volatility	50.0% - 124.5%	50.0% - 116.6%
Remaining term (years)	2.8	3.1
Expected dividend yield	—	—
Risk-free rate	0.3%	1.6%
Annual acquisition event probability	30.0%	20.0%

Private Placement and Prefunded Warrants

The exercise price of the warrants is subject to appropriate adjustment in the event of stock dividends, subdivisions, stock splits, stock combinations, reclassifications, reorganizations or a change of control affecting our common stock. The Company determined that the Private Placement Warrants and the Pre-Funded Warrants should be equity classified in accordance with ASC 480 for the period ended March 31, 2020 . The Company also determined that the Pre-Funded Warrants should be included in the determination of basic earnings per share in accordance with ASC 260, *Earnings per Share* .

9. Stock and employee benefit plans

The Company issues stock options and restricted stock units (“RSUs”) to employees, which generally vest ratably over a four year service period. The Company measures the fair value of stock options on the date of grant using the Black-Scholes option pricing model. The Company measures the fair value of RSUs on the date of grant using the underlying common stock fair value.

Stock-based compensation expense

Total stock-based compensation expense recognized for stock options and RSUs is as follows (in thousands):

	Three Months Ended March 31,	
	2020	2019
Research and development	160	182
General and administrative	$ 224	$ 247
Total	$ 384	$ 429

Stock options

The following table summarizes stock option activity (shares in thousands):

	Shares	Weighted-Average Exercise Price	Weighted-Average Remaining Contractual Term (years)	Aggregate Intrinsic Value
Outstanding at December 31, 2019	1,323	$ 11.65		$ —
Granted	66	$ 1.99		
Exercised	—	$ —		
Cancelled	(19)	$ 4.85		
Outstanding at March 31, 2020	1,370	$ 11.28	7.90	$ —
Exercisable at March 31, 2020	585	$ 18.90	6.72	$ —

RSUs

The following table summarizes RSU activity (shares in thousands):

	Shares	Weighted-Average Grant Date Fair Value
Outstanding as of December 31, 2019	—	$ —
Granted	45	$ 1.98
Vested	—	$ —
Forfeited/cancelled	—	$ —
Outstanding as of March 31, 2020	45	$ 1.98

Employee stock purchase plan

In February 2014, the Company's board of directors adopted the 2014 Employee Stock Purchase Plan and subsequently amended the plan in June 2018 (the "ESPP"). The ESPP authorizes the issuance of up to 337,597 shares of common stock to participating eligible employees and provides for two six-month offering periods. As of March 31, 2020 , there were 217,985 shares remaining for future issuance under the plan.

10. Net loss per share

Basic and diluted net loss per share was calculated as follows for the three months ended March 31, 2020 and 2019 :

	Three months ended March 31,	
	2020	2019
Basic net loss per share:		
Numerator:		
Net loss (in thousands)	$ (12,853)	$ (15,567)
Denominator:		
Weighted average common stock outstanding - basic (in thousands)	28,141	12,713
Dilutive effect of shares of common stock equivalents resulting from common stock options and restricted stock units	—	—
Weighted average common stock outstanding - diluted	28,141	12,713
Net loss per share - basic and diluted	$ (0.46)	$ (1.22)

The following common stock equivalents outstanding as of March 31, 2020 and 2019 , presented on an as converted basis, were excluded from the calculation of net loss per share for the periods presented, due to their anti-dilutive effect (in thousands):

	Three Months Ended March 31,	
	2020	2019
Warrants	4,591	4,600
Stock options	1,370	1,299
RSUs	45	—
Total	6,006	5,899

Item 2. Management's Discussion and Analysis of Financial Condition and Results of Operations

The following information should be read in conjunction with the unaudited consolidated financial information and the notes thereto included in this Quarterly Report on Form 10-Q. The following disclosure contains forward-looking statements that involve risk and uncertainties. Our actual results and timing of certain events could differ materially from those anticipated in these forward-looking statements as a result of certain factors, including those discussed in our Annual Report on Form 10-K.

Overview

We are a biopharmaceutical company that seeks to discover and develop novel cancer immunotherapies using our 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 immunotherapies such as cancer vaccines and cellular therapies by identifying the antigens to which the patient can respond. Consequently, 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 that also relies on ATLAS. We expect to file an IND for GEN-011 in the second quarter of 2020.

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. This approach has been effective against hematologic malignancies and, more recently, certain solid tumors. Vaccines or cellular therapies employing this approach must target specific differences from normal tissue present in a tumor, such as antigens arising from genetic mutations. However, the discovery of optimal antigens for such immunotherapies 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. An effective antigen selection system must therefore account both for each patient's tumor and for their T cell repertoire.

ATLAS achieves effective antigen selection by employing components of the T cell arm of the human immune system from each patient. Using ATLAS, we can measure each patient's T cell responses to a comprehensive set of candidate neoantigens, tumor-associated antigens and tumor-associated viral antigens for their own cancer, allowing us to select those targets associated with the anti-tumor T cell responses that may kill that individual's cancer. We believe that ATLAS represents the most comprehensive and accurate system for antigen discovery. Further, we believe ATLAS identifies a novel candidate antigen profile, that of inhibitory T cell responses. Previously, all candidate antigens were thought either to be targets of effective anti-tumor responses (stimulatory), or irrelevant. However, using ATLAS, we have identified inhibitory antigens we call Inhibigens ™, which are shown to promote tumor progression in preclinical studies. We have also discovered that an antigen can be stimulatory in one patient and inhibitory in another, reinforcing the importance of selecting each patient's potentially immunogenic antigens.

The ATLAS portfolio comprises three patent families. The first two families comprise issued U.S. patents, with patent terms until at least 2031 and 2030, respectively, as well as granted foreign patents and pending U.S. and foreign applications. The third family is directed to ATLAS-based methods for cancer diagnosis, prognosis and patient selection, as well as related compositions. This patent family currently comprises pending applications in eleven foreign jurisdictions 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 include a vaccine that is designed to educate T cells to recognize and attack specific cancer targets, and a cellular therapy intended to introduce T cells that have been educated to attack these targets. We believe that neoantigen vaccines could be used in combination with existing treatment approaches for cancer to potentially direct and enhance an individual's T cell response to his or her cancer, thereby potentially effecting better clinical outcomes. We also believe that isolating and expanding T cell populations targeting specific neoantigens through adoptive cell therapy could provide meaningful clinical benefit.

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

Our lead program, GEN-009, is an adjuvanted neoantigen peptide vaccine candidate. Using ATLAS to identify specific neoantigens, we manufacture a personalized vaccine for each patient using only those neoantigens determined by ATLAS to be stimulatory to that patient's anti-tumor immune responses. 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, for which we have commenced dosing patients, 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 tumors.

The patients in Part A of the trial had little to no detectable tumor at the time of vaccination with GEN-009, but were still at risk of relapse. In the data from the eight dosed patients we observed the following:

- 100% of patients had measurable $CD4^+$ and $CD8^+$ T cell responses to their GEN-009 vaccine;
- Responses were detected against 99% of the administered vaccine neoantigens (N=88 administered antigens), a response rate in excess of that which has been reported previously in response to candidate neoantigen vaccines;
- GEN-009 elicited $CD8^+$ T cell responses *ex vivo* , which is a measure of T cell effector function, for 41% of vaccine neoantigens and $CD4^+$ T cell responses to 51% of neoantigens;
- GEN-009 elicited broad immune responses using an *in vitro* stimulation assay, which is a measure of central memory responses, with 87% of neoantigens eliciting a $CD4^+$ response and 57% of neoantigens eliciting a $CD8^+$ response;
- GEN-009 was well tolerated, with no dose-limiting toxicities observed; and
- Through April 8, 2020, only one of the eight vaccinated patients has developed a recurrent tumor.

We believe the above data confirms the potential antigen selection advantages of ATLAS.

In the fourth quarter of 2019, we began dosing patients for Part B of our GEN-009 study. We anticipate reporting these preliminary clinical results in the third quarter of 2020. We believe that the current patients enrolled are sufficient to determine whether a preliminary clinical signal can be seen, therefore, we have paused enrollment in our GEN-009 Part B trial. Upon review of the preliminary clinical results, we will consider whether it is appropriate to continue the study.

We also are advancing GEN-011, an adoptive T cell therapy specific for neoantigens identified by ATLAS. Adoptive T cell therapies offer an alternative treatment in solid tumors. GEN-011 extracts and specifically expands ATLAS-identified neoantigen-specific T cells from each patient's peripheral blood. We expect to file an IND application for GEN-011 with the U.S. Food and Drug Administration (“FDA”) in the second quarter of 2020, with preliminary clinical results anticipated in the first half of 2021.

We continue to conduct research, principally to explore Inhibigen ™ biology and ways to further strengthen ATLAS. We also continue to explore additional program opportunities. The COVID-19 pandemic has materially affected our ability to continue such efforts, however, so we cannot provide specific timelines for these efforts to translate into new clinical candidates, which might include

non-personalized cancer immunotherapies targeting shared neoantigens, non-mutated tumor-associated antigens, cancers of viral origin such as cancers driven by Epstein-Barr virus infection and Inhibigens ™.

Financing and business operations

We commenced business operations in August 2006. We have financed our operations primarily through the issuance of our equity securities, debt financings, and amounts received through grants. As of March 31, 2020 , we had received an aggregate of $399.7 million in gross proceeds from the issuance of equity securities and gross proceeds from debt facilities and an aggregate of $7.9 million from grants. At March 31, 2020 , our cash and cash equivalents were $26.5 million .

Since inception, we have incurred significant operating losses. We expect to incur significant expenses and increasing operating losses for the foreseeable future. Our net losses may fluctuate significantly from quarter-to-quarter and year-to-year. We will need to generate significant revenue to achieve profitability, and we may never do so.

In October 2019 , we entered into a purchase agreement with Lincoln Park Capital ("LPC") pursuant to which LPC purchased $2.5 million of shares of our common stock at a purchase price of $2.587 per share. In addition, for a period of 30 months, we have the right, at our sole discretion, to sell up to an additional $27.5 million of our common stock based on prevailing market prices of our common stock at the time of each sale. In consideration for entering into the purchase agreement, we issued 289,966 shares of our common stock to LPC as a commitment fee. The purchase agreement limits our sales of shares of common stock to LPC to 5,227,323 shares of common stock, representing 19.99% of the shares of common stock outstanding on the date of the purchase agreement. The purchase agreement also prohibits us from directing LPC to purchase any shares of common stock if those shares, when aggregated with all other shares of our common stock then beneficially owned by LPC and its affiliates, would result in LPC and its affiliates having beneficial ownership, at any single point in time, of more than 9.99% of the then total outstanding shares of our common stock. In January 2020, we sold 186,986 shares of common stock to LPC, for net proceeds of approximately $0.4 million .

In June 2019, we completed an underwritten public offering in which we sold 10,500,000 shares of our common stock at a price of $3.50 per share, for gross proceeds of approximately $36.8 million . This underwritten public offering also included an overallotment option for the underwriters for 1,575,000 shares, which they exercised in full on June 26, 2019. This generated additional gross proceeds of $5.5 million . We incurred approximately $3.9 million of offering-related expenses, resulting in total net proceeds of $38.4 million .

In February 2019, we completed a private placement financing transaction in which we issued shares of our common stock, pre-funded warrants to purchase shares of our common stock, and warrants to purchase shares of our common stock for gross cash proceeds of $15.0 million . We incurred $1.2 million of offering-related expenses, resulting in total net proceeds of approximately $13.8 million .

As reflected in our consolidated financial statements, we used cash to fund operating activities of $13.8 million for the three months ended March 31, 2020 and had $26.5 million available in cash and cash equivalents at March 31, 2020 . In addition, our net losses were $12.9 million for the three months ended March 31, 2020 , and we had an accumulated deficit of $343.8 million . We anticipate that we will continue to incur significant operating losses for the foreseeable future as we continue to develop our product candidates. Until such time, if ever, as we attempt to generate substantial product revenue and achieve profitability, we expect to finance our cash needs through a combination of equity offerings and strategic transactions, and other sources of funding. If we are unable to raise additional funds when needed, we may be required to implement further cost reduction strategies, including ceasing development of GEN-009, GEN-011, and other corporate programs and activities. These factors, combined with our forecast of cash required to fund operations for a period of at least one year from the date of issuance of these consolidated financial statements, raise substantial doubt about our ability to continue as a going concern.

We believe that our cash and cash equivalents at March 31, 2020 are sufficient to support our operating expenses and capital expenditure requirements into the first quarter of 2021.

Costs related to clinical trials can be unpredictable and there can be no guarantee that our current balances of cash and cash equivalents combined with proceeds received from other sources, will be sufficient to fund our trials or operations through this period. These funds will not be sufficient to enable us to conduct pivotal clinical trials for, seek marketing approval for, or commercially launch GEN-009, GEN-011 or any other product candidate. Accordingly, we will be required to obtain further funding through public or private equity offerings, collaboration and licensing arrangements, or other sources. Adequate additional financing may not be available to us on acceptable terms, or at all, which could result in a decision to pause or delay development or advancement of clinical trials for one or more of our product candidates. Similarly, we may decide to pause or delay development or advancement of clinical trials for one or more of our product candidates if we believe that such development or advancement is imprudent or impractical.

Financial Overview

Research and development expenses

Research and development expenses consist primarily of costs incurred to advance our preclinical and clinical candidates, which include:

- salary and related expenses;
- expenses incurred under agreements with contract research organizations ("CROs"), contract manufacturing organizations ("CMOs"), consultants, and other vendors that conduct our clinical trials and preclinical activities;
- costs of acquiring, developing, and manufacturing clinical trial materials and lab supplies; and
- facility costs, depreciation, and other expenses, which include direct and allocated expenses for rent and maintenance of facilities, insurance, and other supplies.

We expense internal research and development costs to operations as incurred. Nonrefundable advanced payments for goods and services that will be used in future research and development activities are expensed when the activity has been performed or when the goods have been received rather than when the payment is made.

The following table identifies research and development expenses for our product candidates as follows (in thousands):

	Three Months Ended March 31,	
	2020	2019
Phase 1/2a programs	$ 4,793	$ 4,720
Discovery and pre-IND	3,809	788
Other research and development	1,385	952
Total research and development	$ 9,987	$ 6,460

Phase 1/2a programs are Phase 1 or Phase 2 development activities. Discovery and pre-IND includes costs incurred to support our discovery research and translational science efforts up to the initiation of Phase 1 development. Other research and development include costs that are not specifically allocated to active product candidates, including facilities costs, depreciation expense, and other costs.

General and administrative expenses

General and administrative expenses consist primarily of salaries and related expenses for personnel in executive and other administrative functions. Other general and administrative expenses include facility costs, and professional fees associated with consulting, corporate and intellectual property legal expenses, and accounting services.

Other income (expense)

Other income (expense) consists of the change in warrant liability, interest expense, net of interest income, and other expense for miscellaneous items, such as the transaction expenses.

Critical Accounting Policies and Significant Judgments and Estimates

We believe that several accounting policies are important to understanding our historical and future performance. We refer to these policies as critical because these specific areas generally require us to make judgments and estimates about matters that are uncertain at the time we make the estimate, and different estimates—which also would have been reasonable—could have been used. The preparation of financial statements in conformity with U.S. GAAP requires us to make estimates and assumptions that affect the amounts reported in the financial statements and accompanying notes. On an ongoing basis, we evaluate estimates, which include prepaid and accrued research and development expenses and the fair value of our warrant liability. We base our estimates on historical experience and other market-specific or other relevant assumptions that we believe to be reasonable under the circumstances. Actual results may differ materially from those estimates or assumptions.

There were no changes to our critical accounting policies during the three months ended March 31, 2020 , as compared to those identified in the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2019 . It is important that the

discussion of our operating results that follow be read in conjunction with the critical accounting policies disclosed in our Annual Report on Form 10-K, as filed with the SEC on February 13, 2020 .

Results of Operations

Comparison of the three months ended March 31, 2020 and 2019

(in thousands)	Three Months Ended March 31, 2020	2019	Increase (Decrease)
Operating expenses:			
Research and development	$ 9,987	$ 6,460	$ 3,527
General and administrative	3,388	3,017	371
Total operating expenses	13,375	9,477	3,898
Loss from operations	(13,375)	(9,477)	3,898
Other income (expense):			
Change in fair value of warrants	781	(5,787)	6,568
Interest expense, net	(259)	(302)	43
Other income (expense)	—	(1)	1
Total other income	522	(6,090)	6,612
Net loss	$ (12,853)	$ (15,567)	$ (2,714)

Research and development expenses

Research and development expenses increased $3.5 million in the three months ended March 31, 2020 , as compared to the three months ended March 31, 2019 . The increase was largely due to increased external manufacturing costs of approximately $2.3 million, increased headcount-related costs of approximately $0.5 million, increased clinical trial costs of approximately $0.3 million, and increased lab supplies costs of approximately $0.2 million.

General and administrative expenses

General and administrative expenses increased $0.4 million in the three months ended March 31, 2020 , as compared to the three months ended March 31, 2019 . The increase was primarily due to increased legal costs of approximately $0.2 million, increased consulting and professional services costs of approximately $0.1 million, and increased rent expense of approximately $0.1 million.

Change in fair value of warrants

Change in fair value of warrants reflects the non-cash change in the fair value of the 2018 Public Offering Warrants, which were recorded at their fair value on the date of issuance and are remeasured at the end of each reporting period. The increase in the change in the fair value of warrants was primarily the result of a decrease in our stock price in the three months ended March 31, 2020 as compared to an increase in our stock price in the three months ended March 31, 2019 .

Interest expense, net

Interest expense, net, consists primarily of interest expense on our long-term debt facilities, offset by interest earned on our cash equivalents.

Liquidity and Capital Resources

Overview

Since our inception in 2006, we have funded operations primarily through proceeds from public issuances of common stock, our long-term debt and the private placement of our common stock.

As of March 31, 2020 , we had approximately $26.5 million in cash and cash equivalents.

In April 2018, we entered into an amended and restated loan and security agreement with Hercules Capital, Inc. ("Hercules"), which was subsequently amended in November 2019 (as amended, the “2018 Term Loan”). The 2018 Term Loan provides a $14.0 million term loan. The 2018 Term Loan will mature on May 1, 2021 and accrues interest at a floating rate per annum equal to the greater of (i) 8.00% or (ii) the sum of 3.00% plus the prime rate. The 2018 Term Loan provides for interest-only payments until January

1, 2021. Thereafter, payments will include equal installments of principal and interest through maturity. The 2018 Term Loan may be prepaid subject to a prepayment charge. We are also obligated to pay an end of term charge of $1.0 million at maturity. As of March 31, 2020 , the Company had outstanding borrowings of $13.5 million .

In October 2019, we entered into a purchase agreement with LPC pursuant to which LPC purchased $2.5 million of shares of our common stock at a purchase price of $2.587 per share. In addition, for a period of 30 months, we have the right, at our sole discretion, to sell up to an additional $27.5 million of our common stock based on prevailing market prices of our common stock at the time of each sale. In consideration for entering into the purchase agreement, we issued 289,966 shares of our common stock to LPC as a commitment fee. The purchase agreement limits our sales of shares of common stock to LPC to 5,227,323 shares of common stock, representing 19.99% of the shares of common stock outstanding on the date of the purchase agreement. The purchase agreement also prohibits us from directing LPC to purchase any shares of common stock if those shares, when aggregated with all other shares of our common stock then beneficially owned by LPC and its affiliates, would result in LPC and its affiliates having beneficial ownership, at any single point in time, of more than 9.99% of the then total outstanding shares of our common stock. In January 2020, the Company sold 186,986 shares of common stock to LPC, for net proceeds of approximately $0.4 million .

In June 2019, we entered into an underwriting agreement relating to the underwritten public offering of 10,500,000 shares of our common stock, par value $0.001 per share, at a price to the public of $3.50 per share, for gross proceeds of approximately $36.8 million (the “2019 Public Offering”). We also granted the underwriters an option to purchase up to an additional 1,575,000 shares of common stock (“Overallotment Option”). In June 2019, the underwriters exercised this option in full. We received approximately $5.5 million in gross proceeds from the underwriter’s exercise of the Overallotment Option. In connection with the 2019 Public Offering, inclusive of the Overallotment Option, we incurred approximately $3.9 million of offering-related expenses, resulting in total net proceeds of $38.4 million .

In February 2019, we completed a private placement financing transaction (the “Private Placement”). We issued 3,199,998 shares (the “Shares”) of common stock, prefunded warrants (the “Pre-Funded Warrants”) to purchase 531,250 shares of common stock (the “Pre-Funded Warrant Shares”), and warrants (the “Private Placement Warrants”) to purchase up to 932,812 shares of common stock (the “Warrant Shares”). The Shares, Pre-Funded Warrants and Private Placement Warrants (collectively, the “Units”) were sold at a purchase price of $4.02 per Unit. We received net cash proceeds of approximately $13.8 million for the purchase of the Shares, Pre-Funded Warrant Shares and Warrant Shares.

Cash Flows

The following table summarizes our sources and uses of cash for the three months ended March 31, 2020 and 2019 (in thousands):

	Three Months Ended March 31,	
	2020	2019
Net cash used in operating activities	$ (13,796)	$ (10,299)
Net cash used in investing activities	(217)	(221)
Net cash provided by financing activities	395	13,197
Net (decrease) increase in cash and cash equivalents	$ (13,618)	$ 2,677

Operating Activities

Net cash used in operating activities increased $3.5 million for the three months ended March 31, 2020 compared to the three months ended March 31, 2019 . The cash used in operations for the three months ended March 31, 2020 was primarily related to the development of our preclinical and clinical candidates.

Investing activities

Net cash used by investing activities was for the purchases of property and equipment in both periods ending March 31, 2020 and 2019 , respectively.

Financing Activities

Net cash provided by financing activities decreased $12.8 million for the three months ended March 31, 2020 compared to the three months ended March 31, 2019 . In the three months ended March 31, 2020 , the Company sold shares of common stock to

LPC, for net proceeds of approximately $0.4 million . In the three months ended March 31, 2019 , the Private Placement generated net proceeds of $13.8 million .

Operating Capital Requirements

Our primary uses of capital are for compensation and related expenses, manufacturing costs for preclinical and clinical materials, third-party clinical trial services, laboratory and related supplies, legal and other regulatory expenses, and general overhead costs. We expect these costs will continue to be the primary operating capital requirements for the near future.

We expect that our existing cash and cash equivalents are sufficient to support our operations into the first quarter of 2021. As reflected in the consolidated financial statements, we had available cash and cash equivalents of $26.5 million at March 31, 2020 . In addition, we had cash used in operating activities of $13.8 million for the three months ended March 31, 2020 . These factors, combined with our forecast of cash required to fund operations for a period of at least one year from the date of issuance of these financial statements, raise substantial doubt about our ability to continue as a going concern. We have based our projections of operating capital requirements on assumptions that may prove to be incorrect and we may use all of our available capital resources sooner than we expect. Because of the numerous risks and uncertainties associated with research, development and commercialization of pharmaceutical products coupled with the global economic uncertainty that has arisen with the recent outbreak of the coronavirus, or referred to as COVID-19, we are unable to estimate the exact amount of our operating capital requirements. Our future funding requirements will depend on many factors, including, but not limited to:

- the timing and costs of our planned clinical trials for GEN-009;
- the progress, timing, and costs of manufacturing GEN-009 for planned clinical trials;
- the outcome, timing, and costs of seeking regulatory approvals, including an IND application for GEN-011;
- the initiation, progress, timing, costs, and results of preclinical studies and clinical trials for our other product candidates and potential product candidates;
- the terms and timing of any future collaborations, grants, licensing, consulting, or other arrangements that we may establish;
- the amount and timing of any payments we may be required to make, or that we may receive, in connection with the licensing, filing, prosecution, defense and enforcement of any patents or other intellectual property rights, including milestone payments, royalty payments and patent prosecution fees that we are obligated to pay pursuant to our license agreements;
- the costs of preparing, filing, and prosecuting patent applications, maintaining and protecting our intellectual property rights, and defending against intellectual property related claims;
- the extent to which we in-license or acquire other products and technologies;
- the receipt of marketing approval;
- the costs of commercialization activities for GEN-009 and other product candidates, if we receive marketing approval, including the costs and timing of establishing product sales, marketing, distribution, and manufacturing capabilities; and
- revenue received from commercial sales of our product candidates.

We will need to obtain substantial additional funding in order to complete clinical trials and receive regulatory approval for GEN-009, GEN-011 and our other product candidates. To the extent that we raise additional capital through the sale of our common stock, convertible securities, or other equity securities, the ownership interests of our existing stockholders may be materially diluted and the terms of these securities could include liquidation or other preferences that could adversely affect the rights of our existing stockholders. In addition, debt financing, if available, would result in increased fixed payment obligations and may involve agreements that include restrictive covenants that limit our ability to take specific actions, such as incurring additional debt, making capital expenditures, or declaring dividends, that could adversely affect our ability to conduct our business. If we are unable to raise capital when needed or on attractive terms, we could be forced to significantly delay, scale back, or discontinue the development of GEN-009, GEN-011 or our other product candidates, seek collaborators at an earlier stage than otherwise would be desirable or on terms that are less favorable than might otherwise be available, and relinquish or license, potentially on unfavorable terms, our rights to GEN-009, GEN-011 or our other product candidates that we otherwise would seek to develop or commercialize ourselves.

Off-Balance Sheet Arrangements

We do not have any off-balance sheet arrangements.

Item 3. Quantitative and Qualitative Disclosures about Market Risk

We had cash and cash equivalents of approximately $26.5 million as of March 31, 2020 . The primary objectives of our investment activities are to preserve principal, provide liquidity and maximize income without significantly increasing risk. Our primary exposure to market risk relates to fluctuations in interest rates, which are affected by changes in the general level of U.S. interest rates. Given the short-term nature of our cash and cash equivalents, we believe that a sudden change in market interest rates would not be expected to have a material impact on our financial condition and/or results of operations. We do not own any derivative financial instruments.

We do not believe that our cash, cash equivalents and marketable securities have significant risk of default or illiquidity. While we believe our cash and cash equivalents do not contain excessive risk, we cannot provide absolute assurance that in the future our investments will not be subject to adverse changes in market value. In addition, we maintain significant amounts of cash, cash equivalents and marketable securities at one or more financial institutions that are in excess of federally insured limits.

Inflation generally affects us by increasing our cost of labor and clinical trial costs. We do not believe that inflation had a material effect on our results of operations during the three months ended March 31, 2020 .

Item 4. Controls and Procedures

Management's Evaluation of our Disclosure Controls and Procedures

We maintain disclosure controls and procedures that are designed to ensure that information required to be disclosed in the reports that we file or submit under the Securities Exchange Act of 1934, as amended, is (1) recorded, processed, summarized, and reported within the time periods specified in the SEC's rules and forms and (2) accumulated and communicated to our management, including our principal executive officer and principal financial officer, to allow timely decisions regarding required disclosure.

Our management, with the participation of our principal executive officer and principal financial officer, evaluated the effectiveness of our disclosure controls and procedures as of March 31, 2020 (as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended). Our management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives, and management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures. Our principal executive officer and principal financial officer have concluded based upon the evaluation described above that, as of March 31, 2020 , our disclosure controls and procedures were effective at the reasonable assurance level.

Changes in Internal Control Over Financial Reporting

During the three months ended March 31, 2020 , there have been no changes in our internal control over financial reporting, as such term is defined in Rules 13a-15(f) and 15(d)-15(f) promulgated under the Securities Exchange Act of 1934, as amended, that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

PART II. OTHER INFORMATION

Item 1. Legal Proceedings

In the ordinary course of business, we are from time to time involved in lawsuits, claims, investigations, proceedings, and threats of litigation relating to intellectual property, commercial arrangements and other matters. We do not believe we are currently party to any pending legal action, arbitration proceeding or governmental proceeding, the outcome of which, if determined adversely to us, would individually or in the aggregate be reasonably expected to have a material adverse effect on our business or operating results . We are not a party to any material proceedings in which any director, member of senior management or affiliate of ours is either a party adverse to us or our subsidiaries or has a material interest adverse to us or our subsidiaries.

Item 1A. Risk Factors

There have been no material changes from the risk factors set forth in the Company's Annual Report Form 10-K for the year ended December 31, 2019 , except as set forth below.

A pandemic, epidemic or outbreak of an infectious disease, such as the novel coronavirus, or COVID-19, has and may in the future adversely affect our business.

An outbreak of COVID-19 occurred in China in December 2019 and has spread around the world. The Center for Disease Control (CDC) has recognized this outbreak as a pandemic which has caused shutdowns to businesses and cities worldwide while disrupting supply chains, business operations, travel, consumer confidence, and business sentiment. The situation is ever evolving and its effects both short-term and long-term remain unknown. The spread of COVID-19 has resulted in certain disruptions to our business and may result in future additional disruptions to our business. Examples of both include without limitation the following:

- The COVID-19 pandemic has materially affected our ability to conduct research, principally to explore Inhibigen ™ biology and ways to further strengthen ATLAS and other program opportunities.
- The health and wellbeing of our employees and suppliers is at risk- if a critical threshold of our personnel, or the personnel of our suppliers, were to be diagnosed with COVID-19, placed in quarantine due to potential exposure to COVID-19, or need to care for family members diagnosed with COVID-19, it may result in significant manufacturing and business disruption.
- Our clinical sites may no longer be able to continue with the GEN-009 clinical trial or limit patient enrollment which could have a material impact on our milestones and timelines. Further, clinical sites may not be engaging in new clinical programs which could have a material impact on our GEN-011 program.
- We have asked most employees who are not directly involved in our GEN-009 and GEN-011 clinical programs to work from home, which could impact our ability to effectively plan, execute, communicate and maintain our corporate culture. The increase in working remotely could increase our cyber security risk, create data accessibility concerns, and make us more susceptible to communication disruptions, any of which could adversely impact our business operations.
- Stay at home orders have significantly limited the ability of individuals from traveling outside the home which may limit our ability to hire new employees or backfill terminated employees.
- Equity and debt markets have experienced significant volatility since the spread of COVID-19 into the United States. Should significant volatility continue or they experience declines due to the economic impact of COVID-19, we may not be able to raise capital at a reasonable valuation or at all.

The full extent to which COVID-19 impacts our business will depend on future developments, which are highly uncertain and cannot be predicted, including new information which may emerge concerning the severity of COVID-19 and the actions to treat or contain COVID-19 or to otherwise limit its impact, among others.

Disruptions at the FDA and other government agencies caused by funding shortages or global health concerns could hinder their ability to hire, retain or deploy key leadership and other personnel, or otherwise prevent new or modified products from being developed, cleared or approved, or commercialized in a timely manner or at all, which could negatively impact our business.

The ability of the FDA to review and clear or approve new products can be affected by a variety of factors, including government budget and funding levels, statutory, regulatory, and policy changes, the FDA’s ability to hire and retain key personnel and accept the payment of user fees, and other events that may otherwise affect the FDA’s ability to perform routine functions. Average review times at the agency have fluctuated in recent years as a result. In addition, government funding of other government agencies that fund research and development activities is subject to the political process, which is inherently fluid and unpredictable. Disruptions

at the FDA and other agencies may also slow the time necessary for marketing applications, clinical trial authorizations or other regulatory submissions to drug candidates to be reviewed and/or approved by necessary government agencies, which would adversely affect our business. For example, over the last several years, including for 35 days beginning on December 22, 2018, the U.S. government has shut down several times and certain regulatory agencies, such as the FDA, have had to furlough critical employees and stop critical activities.

Separately, in response to the global pandemic of COVID-19, on March 10, 2020, the FDA announced its intention to postpone most foreign inspections of manufacturing facilities and products through April 2020, and subsequently, on March 18, 2020, the FDA announced its intention to temporarily postpone routine surveillance inspections of domestic manufacturing facilities. Regulatory authorities outside the United States may adopt similar restrictions or other policy measures in response to the COVID-19 pandemic. If a prolonged government shutdown occurs, or if global health concerns continue to prevent the FDA or other regulatory authorities from conducting their regular inspections, reviews, or other regulatory activities, it could significantly impact the ability of the FDA or other regulatory authorities to timely review and process our marketing applications, clinical trial authorizations, or other regulatory submissions, which could have a material adverse effect on our business.

Item 6. Exhibits

Exhibit Number	Exhibit
10.1*	Employment Letter Agreement between Girish Aakalu and Genocea Biosciences, Inc., dated December 6, 2018
10.2*	Employment Letter Agreement between Thomas Davis and Genocea Biosciences, Inc., dated October 1, 2018
10.3*†	Form of Restricted Stock Unit Award Agreement under the Genocea Biosciences, Inc. 2014 Equity Incentive Plan
31.1	Certification pursuant to Section 302 of Sarbanes Oxley Act of 2002 by Chief Executive Officer
31.2	Certification pursuant to Section 302 of Sarbanes Oxley Act of 2002 by Chief Financial Officer
32.1	Certification of periodic financial report pursuant to Section 906 of Sarbanes Oxley Act of 2002 by Chief Executive Officer
32.2	Certification of periodic financial report pursuant to Section 906 of Sarbanes Oxley Act of 2002 by Chief Financial Officer
101	The following materials from the Company’s Quarterly Report on Form 10-Q for the quarter ended March 31, 2020, formatted in XBRL (eXtensible Business Reporting Language): (i) Condensed Consolidated Balance Sheets as of March 31, 2020 and December 31, 2019, (ii) Condensed Consolidated Statements of Operations and Comprehensive Income for the three months ended March 31, 2020 and 2019, (iii) Condensed Consolidated Statements of Stockholders' Equity (Deficit) for the three months ended March 31, 2020 and 2019, (iv) Condensed Consolidated Statements of Cash Flows for the three months ended March 31, 2020 and 2019 and (v) Notes to Unaudited Condensed Consolidated Financial Statements

* Filed herewith.
† Indicates a compensatory plan.

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

Genocea Biosciences, Inc.

Date: April 30, 2020

By: /s/ WILLIAM D. CLARK

William D. Clark

President and Chief Executive Officer and Director

(Principal Executive Officer)

Date: April 30, 2020

By: /s/ DIANTHA DUVALL

Diantha Duvall

Chief Financial Officer

(Principal Financial and Accounting Officer)

November 6, 2018

Dear Girish:

This letter agreement ("Agreement") sets forth the terms and conditions of your offer of employment with Genocea Biosciences, Inc. (the "Company"). If accepted, the terms hereof shall be effective, and your employment shall commence on December 6, 2018 (the "Effective Date").

1. **Position and Duties** . You shall serve, on a full-time basis, as the Company's Chief Business Officer, reporting directly to the Company's Chief Executive Officer. You agree that while employed by the Company you shall devote your full business time and professional efforts to the performance of your duties and responsibilities to the Company; abide by all Company policies and procedures as in effect from time to time; perform all of the customary duties of your position, which will include, but not be limited to, overseeing the Company's Business Development activities at all times with the highest legal, ethical and professional standards.

2. **Compensation and Benefits** . During your employment, as compensation for all services performed by you for the Company and subject to the performance of your duties and responsibilities to the Company pursuant to this Agreement or otherwise, the Company will provide you with the following compensation and benefits:

(a). **Base Salary** . The Company shall pay you a Base Salary at the rate of $385,000 per year in accordance with the Company's standard payroll practices, as in effect from time to time but at least on a semi-monthly basis ("Base Salary"). The Company shall review your Base Salary on an annual basis for upward adjustment. Any adjustments will be determined by the Company, in its sole discretion.

(b). Annual Bonus Compensation. Beginning for the calendar year 2019, you will be eligible to receive a performance-based annual bonus with a target of 40% of your Base Salary in effect as of December 31 of the previous calendar year (the "Target Bonus"). Your annual bonus, if any, for any year will be determined by the Board of Directors of the Company (the "Board") or the Compensation Committee of the Board (the "Committee") in accordance with the Company's annual bonus plan as in effect from time to time and will be based on performance criteria established by the Board or the Committee and disclosed to you within sixty (60) days of the beginning of each calendar year Any bonus due to you hereunder will be paid not later than March 15 th of the year following the year to which the bonus relates. In the event

you are otherwise eligible to receive a Target Bonus and the Company terminates your employment without Cause or you terminate your employment for Good Reason (as defined below) following the conclusion of given calendar year, you will receive your full Target Bonus for that year and receive a pro-rated Target Bonus for the year (to be paid the subsequent year in accordance with the Company's payment practices) in which your termination or resignation occurs based upon the number of days worked in such year. In the event your employment is terminated for Cause or you resign without Good Reason, you will not receive any Target Bonus from the Company. The foregoing shall be construed and applied so that any bonus payable to you hereunder qualifies as a "short-tern deferral" under Section 409A.

(c). **Signing Bonus** . The Company shall pay you a cash signing bonus in the amount of $150,000 (the "Signing Bonus") payable on the first eligible payroll date in January 2019. In the event you receive the Signing Bonus but voluntarily terminate your employment without Good Reason (as defined below) within twelve months after the Effective Date, then you shall pay back to the Company a pro-rated portion of the Signing Bonus based upon the number of days remaining in this twelve-month period prior to termination of employment. You must pay this pro-rated portion to the Company within 30 days of the date of such termination of employment. You will not be required to repay the Signing Bonus in the event of termination of employment under any other circumstances.

(d). **Stock Option Award** . Subject to approval by the Board, at the first regularly scheduled meeting of the Board following the Effective Date, you will be eligible to receive a stock option award under the Company's equity plan then in effect with respect to 650,000 shares of common stock of the Company ("Common Stock"), with an exercise price that is no less than the fair market value of a share of Common Stock on the date of grant. To be eligible to receive this stock option award, you must be employed by the Company on the date the award is granted. The stock option award will be subject to the terms of the Company's equity plan under which it is granted and the terms of the award agreement evidencing such stock option.

(e). **Benefits** . As an employee, you will also be eligible to participate in the Company's standard employee benefit plans and programs as in effect from time to time for employees of the Company generally, except to the extent such plans or programs are duplicative of benefits otherwise provided to you under this Agreement (e.g., severance pay) or under any other agreement. Your participation in such plans or programs will be subject to the terms of the applicable plan documents and generally applicable Company policies.

(f). **Vacation** . You will be entitled to four (4) weeks of paid vacation, to be taken at such time or times as the needs of the Company's business reasonably permit and in accordance with the Company's policies from time to time in effect. You will be allowed to carry over one week of unused vacation from one year to the next.

(g). **Insurance** . You shall be entitled to liability insurance coverage on the same basis as other officers of the Company as to your acts or omissions to act during your employment with the Company as a manager or officer of the Company.,

3. Confidential Information and Invention Assignment Agreement. As a condition of your employment, you will be required to enter into a Confidential Information and Invention Assignment Agreement with the Company (the "Restricted Activities Agreement"), which will require, among other provisions, the assignment of patent rights to any invention made during your employment with the Company and nondisclosure of Company proprietary information. Your employment with the Company and the receipt of any severance payments or benefits under Section 5 of this Agreement are each conditioned upon and subject to your compliance with the Restricted Activities Agreement.

4. Termination of Employment. Your employment under this Agreement shall continue until terminated pursuant to this Section 4.

(a). **Termination for Cause** . The Company may terminate your employment for Cause, as defined below, upon written notice to you setting forth in reasonable detail the nature of the Cause. The following, as determined by the Board in its reasonable judgment, shall constitute "Cause" for termination:

(i). the indictment or conviction for, any felony or any other crime involving dishonesty;

(ii). participation in any fraud, deliberate and substantial misconduct, breach of duty of loyalty or breach of fiduciary duty against the Company or any Affiliate;

(iii). intentional and material damage to any property of the Company or any Affiliate;

(iv). serious and intentional or willful misconduct against the Company or any of its employees; or

(v). your breach of any material provision of this Agreement or the Restricted Activities Agreement.

Termination of your employment by the Company for Cause will result in no severance pay or severance benefits. In the case of termination for Cause under Section 4(a)(iii) or 4(a)(v), the Company will notify you of the conditions for such termination no later than 30 days following the occurrence of the condition and shall provide you with 10 days to remedy the condition in the event such condition is curable.

(a). Termination without Cause. The Company may terminate your employment at any time other than for Cause upon 14 days' written notice to you.

(b) Termination for Good Reason. You may terminate your employment hereunder for Good Reason, as defined below, by providing written notice to the Company of the condition giving rise to the Good Reason, specifying in detail the basis for such claim of Good Reason, no later than 30 days following the occurrence of the condition, by giving the Company 30 days to remedy the condition and by terminating employment for Good Reason

within 30 days thereafter if the Company fails to remedy the condition. The following, if occurring without your consent, shall constitute "Good Reason" for termination by you:

(i). material diminution of your duties to the Company;

(ii). a material reduction in your Base Salary, or Target Bonus percentage of 40% (with materiality being defined for purposes of this subsection as five percent (5%) or more of the existing salary or Target Bonus percentage);

(iii). the failure of the Company to pay or to provide any of the compensation or benefits (including without limitation the compensation and benefits set forth in Section 2 of this Agreement) when due; for the avoidance of doubt, you understand that a good faith change in the Company's standard benefit plans and programs will not been deemed **to** constitute "Good Reason";

(iv). any directive given to you by the Company in violation of any law, regulation or Company policy;

(v). a breach by the Company of a material provision of this Agreement; or

(vi). a change in the principal location at which you provide services to the Company beyond fifty (50) miles from Cambridge, Massachusetts.

(c). Termination without Good Reason. You may terminate your employment with the Company other than for Good Reason at any time upon 30 days' written notice to the Company.

(d). Termination Due to Death or Disability. This Agreement shall automatically terminate in the event of your death during employment. The Company may also terminate your employment, upon notice to you, in the event you become disabled during employment. For purposes of this Agreement, Disability is defined as any illness, accident, injury or condition of either a physical or psychological nature the onset of which renders you unable to continue to perform substantially all of your duties and responsibilities under this Agreement (notwithstanding the provision of any reasonable accommodation) for 180 days (whether or not consecutive) during any period of 365 consecutive calendar days. If any question shall arise as to whether you are disabled to the extent that you are unable to perform substantially all of your duties and responsibilities for the Company and its Affiliates, you shall, at the Company's request and expense, submit to a medical examination by a physician selected by the Company **and** such determination shall, for the purposes of this Agreement, be conclusive of the issue. If such a question arises and you fail to submit to the requested medical examination, the Company's determination of the issue shall be binding on you.

5. **Severance and other Matters Related to Termination.**

(a). **Termination by the Company without Cause or by you for Good Reason.** Subject to Section 5(b), Section 5(f) and Section 11, in the event that your employment is terminated by the Company without Cause pursuant to Section 4(b) or by you for Good Reason pursuant to Section 4(b), in addition to the Accrued Compensation (as defined below), which shall be paid at the time provided in Section 5(d) below, you shall be entitled to the severance payments and benefits specified below.

(i). the Company shall continue to pay you your Base Salary, at the rate then in effect, for the 9-month period following the date on which your employment with the Company terminates in accordance with the Company's standard payroll policy as then in effect and shall pay you the Target Bonus as further detailed in Section 2(b) above; and

(ii). subject to your timely election to continue participation in the Company's group health and dental plans under COBRA, and only for so long as you are eligible for such coverage through COBRA, the Company shall pay you, on a monthly and taxable basis, an amount equal to the full monthly premium cost of such participation until the conclusion of the nine-month period following the date on which your employment with the Company terminates, or, if earlier, until the date you become eligible to enroll in such plans of any new employer.

(b). **Termination by the Company without Cause or by you for Good Reason in connection with a Change of Control.** Subject to Section 5(f), and Section 11, in the event that your employment is terminated by the Company without Cause pursuant to Section 4(b) or by you for Good Reason pursuant to Section 4(b), in either case, within **12** months following a Change of Control, in addition to the Accrued Compensation (as defined below), which shall be paid at the time specified in Section 5(d) below, in lieu of any payments and benefits provided in Section 5(a) above, you shall be entitled to the severance payments and benefits specified below:

(i). the Company shall continue to pay you your Base Salary, at the rate then in effect, for the 15-month period following the date on which your employment with the Company terminates in accordance with the Company's standard payroll policy as then in effect;

(ii). subject to your timely election to continue participation in the Company's group health and dental plans under COBRA, and only for so long as you are eligible for such coverage through COBRA, the Company shall pay you, on a monthly and taxable basis, an amount equal to the full monthly premium cost of such participation until the conclusion of the 15-month period following the date on which your employment with the Company terminates, or, if earlier, until the date you become eligible to enroll in such plans of any new employer; and

(iii). all outstanding and unvested stock options and other equity awards then held by you will become fully vested and exercisable and, with respect to any stock options

then held by you, shall remain exercisable for the period of time set forth in the applicable grant agreement.

(c). **Termination by the Company due to your Disability or due to your Death.** Subject to Section 5(f) and Section 11, in the event your employment with the Company is terminated by the Company due to your Disability (as defined above) or is terminated due to your death, in either case, pursuant to Section 4(e), in addition to the Accrued Compensation (as defined below), which shall be paid at the time specified in Section 5(d), the Company shall pay you at the same time as the Accrued Compensation is paid a pro-rata annual bonus for the year in which such termination of employment occurs, calculated by multiplying your target annual bonus for such year by a fraction, the numerator of which is the number of days you were employed during such year and the denominator of which is 365 (the "Pro-Rata Bonus").

(d). **Any Termination.** In the event your employment with the Company terminates for any reason, in addition to the compensation set forth above in connection with a termination without Cause or for Good Reason, you will remain entitled to, and will be paid, any Target Bonus payment due under Section 2(b) and not paid at the time of termination, and the Company shall also pay you on the first payroll date that follows the date of the termination of your employment (or on such earlier date as is required by law) the Accrued Compensation. For purposes of this Agreement, "Accrued Compensation" means any Base Salary earned but not paid through the date of the termination of employment and an amount equal to the value of any vacation time accrued but unused as of such date.

(e). Parachute Payments.

(i). In the event of the consummation of a change in ownership or control within the meaning of Section 280G (a "280G Change in Control") of the Company following the time that the Company has stock readily tradeable on an established securities market (within the meaning of Section 280G and the regulations thereunder), if all or a portion of the payments and benefits under this Agreement, together with any other payments and benefits provided to you by the Company or its Affiliates (including, without limitation, any accelerated vesting of stock options and other equity awards) (the "Total Payments"), would constitute an "excess parachute payment" within the meaning of Section 280G (the aggregate of such payments (or portions thereof) being hereinafter referred to as the "Excess Parachute Payments"), you will be entitled to receive (A) an amount limited so that no portion thereof shall fail to be tax deductible under Section 280G (the "Limited Amount"), or (B) if the amount otherwise payable hereunder or otherwise (without regard to clause (A)) reduced by all taxes applicable thereto (including, for the avoidance of doubt, the excise tax levied under Section 4999 of the Code (the "Excise Tax")) would be greater than the Limited Amount reduced by all taxes applicable thereto, the amount otherwise payable hereunder **or** otherwise.

(ii). The determination as to whether the Total Payments include Excess Parachute Payments and, if so, the amount of such Excess Parachute Payments, the amount of any Excise Tax with respect thereto, and the amount of any reduction in Total Payments shall

be made at the Company's expense by the independent public accounting firm most recently serving as the Company's outside auditors or such other accounting or benefits consulting group or firm as the Company may designate (the "Accountants"). In the event that any payments under this Agreement or otherwise are required to be reduced as described in Section 5(e)(i), the adjustment will be made, first, by reducing the amount of Base Salary payable pursuant to Section 5(a)(i) or Section 5(b)(i), as applicable; second, if additional reductions are necessary, by reducing the payment of the amounts due to you pursuant to Section 5(a)(ii) or Section 5(b)(ii), as applicable; and third, if additional reductions are still necessary, by eliminating the accelerated vesting of stock option awards and other equity awards, if any, starting with those awards for which the amount required to be taken into account under Section 280G is the greatest.

(iii). In the event that there has been an underpayment or overpayment under this Agreement or otherwise as determined by the Accountants, the amount of such underpayment or overpayment shall forthwith be paid to you or refunded to the Company, as the case may be, with interest at the applicable federal rate provided for in Section 7872(f)(2) of the Code.

(f). Release. Any obligation of the Company to provide you severance payments or other benefits (including accelerated vesting of stock options and other equity awards) or any Pro-Rata Bonus under this Section 5 (for the avoidance of doubt, other than Accrued Compensation), is conditioned on your (or your legal representative, if applicable, in the case of a termination due to your death or disability pursuant to Section 4(e)) signing a release of claims in the form provided by the Company (the "Release") following the termination of your employment within a period of time not to exceed 45 days from the date of your receipt of such Release, and on your (or your legal representative, if applicable) not revoking the Release within the revocation period provided therein following your (or your legal representative's, if applicable) execution of the Release, which release shall not apply to (i) any payments due under this Agreement that survive termination of employment, (ii) claims for indemnification in your capacity as an officer or director of the Company under the Company's Certificate of Incorporation, Bylaws or written agreement, if any, providing for director or officer indemnification, (iii) rights to receive insurance payments under any policy maintained by the Company, (iv) rights under any stock option or equity agreements that remain vested or exercisable after termination and (v) rights to receive retirement benefits that are accrued and fully vested at the time of your termination. Except as otherwise provided in Section 11 of this Agreement, any payments to be made in the form of salary continuation pursuant to the terms of this Agreement shall be payable in accordance with the normal payroll practices of the Company, with the first such payment (which shall be retroactive to the day immediately following the date of your termination of employment) due and payable as soon as administratively practicable following the date the Release becomes effective, but not later than the date that is 60 days following the date your employment terminates. Notwithstanding the foregoing, if the date your employment terminates occurs in one taxable year and the date that is 60 days following such termination date occurs in a second taxable year, to the extent

required by Section 409A, such first payment shall not be made prior to the first day of the second taxable year. For the avoidance of doubt, if you (or your legal representative, if applicable) do not execute an Release within the period specified in this Section 5(f), or if you (or your legal representative, if applicable) revoke the executed Release within the time period permitted by law, you will not be entitled to any payments or benefits (including the accelerated vesting of stock options or other equity awards) or any Pro-Rata Bonus set forth in this Section 5 (other than the Accrued Compensation), any stock options and other equity awards that vested on account of such termination as provided for in this Agreement shall be cancelled with no consideration due to you, and neither the Company nor any of its Affiliates will have any further obligations to you under this Agreement or otherwise. You agree to provide the Company prompt notice of your eligibility to participate in the health and, if applicable, dental, plan of any employer. You further agree to repay any overpayment of health and, if applicable, dental, benefit premiums made by the Company hereunder. Notwithstanding anything to the contrary herein, in the event that the Company's payment of the amounts described in Section 5(a)(ii) or Section 5(b)(ii), as applicable, would subject the Company to any tax or penalty under the Patient Protection and Affordable Care Act (as amended from time to time, the "ACA") or Section 105(h) of the Internal Revenue Code of 1986, as amended ("Section 105(h)"), or applicable regulations or guidance issued under the ACA or Section 105(h), you and the Company agree to work together in good faith to restructure such benefit.

(g). **Survival, Conditions to Severance.** Provisions of this Agreement shall survive any termination if so provided in this Agreement or if necessary or desirable to accomplish the purposes of other surviving provisions, including without limitation your obligations under Section 3 of this Agreement and under the Restricted Activities Agreement and the Nondisclosure Agreement. The obligation of the Company to make payments to you or on your behalf under Section 5 of this Agreement is expressly conditioned upon (i) your full performance of your obligations under Section 3 hereof pursuant to the Restricted Activities Agreement and the Nondisclosure Agreement and under any subsequent agreement between you and the Company or any of its Affiliates relating to confidentiality, non-competition, proprietary information or the like, and (ii) your (or your legal representative's, if applicable, in the case of a termination due to your death or disability pursuant to Section 4(e)) timely execution and non-revocation of the Release as set forth in Section 5(f).

6. Definitions. For purposes of this Agreement, the following definitions apply:

(a). "Affiliates" means all persons and entities directly or indirectly controlling, controlled by or under common control with the Company, where control may be by management authority, equity interest or otherwise.

(b). "Change of Control" means the first to occur of any of the following: (i) a merger or consolidation in which (A) the Company is a constituent party, or (B) a subsidiary of the Company is a constituent party and the Company issues shares of its capital stock pursuant to such merger or consolidation, except in the case of either clause (A) or (B) any such merger or

consolidation involving the Company or a subsidiary of the Company in which the beneficial owners of the shares of capital stock of the Company outstanding immediately prior to such merger or consolidation continue beneficially to own, immediately following such merger or consolidation, at least a majority by voting power of the capital stock of (x) the surviving or resulting corporation or (y) if the surviving or resulting corporation is a wholly owned subsidiary of another corporation immediately following such merger or consolidation, the parent corporation of such surviving or resulting corporation; (ii) the sale, lease, transfer, exclusive license or other disposition, in a single transaction or series of related transactions, by the Company or a Company subsidiary of all or substantially all the assets of the Company and the Company subsidiaries taken as a whole (except in connection with a merger or consolidation not constituting a Change of Control under clause (i) or where such sale, lease, transfer, exclusive license or other disposition is to a wholly owned Company subsidiary); or (iii) the sale or transfer, in a single transaction or series of related transactions, by the stockholders of the Company of more than 50% by voting power of the then-outstanding capital stock of the Company to any Person or entity or group of affiliated Persons or entities.

(c). "Code" means the Internal Revenue Code of 1986, as amended.

(d). "Person" means an individual, a corporation, an association, a partnership, an estate, a trust and any other entity or organization, other than the Company or any of its Affiliates.

(e). "Section 280G" means Section 280G of the Code, together with the regulations thereunder.

(f). "Section 409A" means Section 409A of the Code, together with the regulations thereunder.

7. Conflicting Agreements. You hereby represent and warrant that your signing of this Agreement and the performance of your obligations under it will not breach or be in conflict with any other agreement to which you are a party or are bound and that you are not now subject to any covenants against competition or similar covenants or any court order that could affect the performance of your obligations under this Agreement. You agree that, during the term of your employment with the Company, you will not engage in any other employment, occupation, consulting or other business activity directly related to the business in which the Company is now involved or becomes involved during the term of your employment, nor will you engage in any other activities that conflict with your obligations to the Company. Notwithstanding the foregoing, nothing in this Agreement shall prevent you from serving as an advisor or director for any for-profit businesses or non-profit organization or serving in various other capacities in community, civic, religious, charitable or trade organizations, provided that such participation does not, individually or in the aggregate, materially interfere or conflict with the performance of your duties hereunder. You further agree not to disclose or use on behalf of the Company any proprietary or confidential information of a third party, including that of any former employer, without such third party's consent.

8. Withholding; Other Tax Matters. Anything to the contrary notwithstanding, all payments required to be made by the Company hereunder to you shall be subject to the withholding of such amounts, if any, relating to tax and other payroll deductions as the Company may determine it should withhold pursuant to any applicable law or regulation **.**

9. Assignment. Neither you nor the Company may make any assignment of this Agreement or any interest in it, by operation of law or otherwise, without the prior written consent of the other; provided, however, that the Company may assign its rights and obligations under this Agreement without your consent to one of its Affiliates or to any Person with or into which the Company hereafter affects a reorganization, consolidates or merges, or to which it transfers all or substantially all of its properties or assets. This Agreement shall inure to the benefit of and be binding upon you and the Company and each of its respective successors, executors, administrators, heirs and permitted assigns **.**

10. Severability. If any portion or provision of this Agreement shall to any extent be declared illegal or unenforceable by a court of competent jurisdiction, then the remainder of this Agreement, or the application of such portion or provision in circumstances other than those as to which it is so declared illegal or unenforceable, shall not be affected thereby, and each portion and provision of this Agreement shall be valid and enforceable to the fullest extent permitted by law.

11. Section 409A.

(a). You and the Company agree that this Agreement shall be interpreted to comply with or be exempt from Section 409A, and the regulations and guidance promulgated thereunder to the extent applicable, and all provisions of this Agreement shall be construed in a manner consistent with the requirements for avoiding taxes or penalties under Section 409A.

(b). A termination of employment shall not be deemed to have occurred for purposes of any provision of this Agreement providing for the payment of any amounts or benefits considered "nonqualified deferred compensation" under Section 409A upon or following a termination of employment unless such termination is also a "separation from service" within the meaning of Section 409A (after giving effect to the presumptions contained therein) and, for purposes of any such provision of this Agreement, references to a "termination", "termination of employment" or like terms shall mean "separation from service". If you are deemed on the date of termination to be a "specified employee" within the meaning of that term under Section 409A(a)(2)(B), then with regard to any payment or the provision of any benefit that is considered nonqualified deferred compensation under Section 409A payable on account of a "separation from service", such payment or benefit shall be made or provided at the date which is the earlier of (a) the expiration of the six-month period measured from the date of such "separation from service", and (b) the date of your death (the "Delay Period"). Upon the expiration of the Delay Period, all payments and benefits delayed pursuant to this Section 11(b) (whether they would have otherwise been payable in a single sum or in installments in the absence of such delay) shall be paid or reimbursed on the first business day following the expiration of the Delay Period **to** you

in a lump sum, and any remaining payments and benefits due under this Agreement shall be paid or provided in accordance with the normal payment dates specified for them herein.

(c). With regard to any provision herein that provides for payment or reimbursement of costs and expenses or in-kind benefits, except as permitted by Section 409A, (a) the right to payment, reimbursement or in-kind benefits shall not be subject to liquidation or exchange for another benefit; (b) the amount of expenses eligible for payment or reimbursement, or in-kind benefits, provided during any taxable year shall not affect the expenses eligible for payment or reimbursement, or in-kind benefits, to be provided in any other taxable year; and (c) such payments shall be made on or before the last day of your taxable year following the taxable year in which the expense occurred.

(d). For purposes of Section 409A, your right to receive any installment payments pursuant to this Agreement shall be treated as a right to receive a series of separate and distinct payments.

(e). In no event shall the Company or any of its Affiliates have any liability relating to the failure or alleged failure of any payment or benefit under this Agreement to comply with, or be exempt from, the requirements of Section 409A.

12. Entire Agreement. This Agreement, together with the Restricted Activities Agreement and the Nondisclosure Agreement, sets forth the entire agreement between you and the Company and replaces and supersedes all prior communications, agreements and understandings, written or oral, with respect to the terms and conditions of your employment.

13. Amendment. This Agreement may not be modified or amended, and no breach shall be deemed to be waived, except by a written agreement signed by an authorized representative of the Company and you.

14. Miscellaneous. The headings and captions in this Agreement are for convenience only and in no way define or describe the scope or content of any provision of this Agreement. This Agreement may be executed in two or more counterparts, each of which shall be an original and all of which together shall constitute one and the same instrument. This is a Massachusetts contract and shall be governed and construed in accordance with the laws of the Commonwealth of Massachusetts, without regard to the conflict-of-laws principles thereof.

15. Notices. Any notices provided for in this Agreement shall be in writing and shall be effective when delivered in person, consigned to a reputable national courier service for overnight delivery or deposited in the United States mail, postage prepaid, and addressed to you at your last known address on the books of the Company or, in the case of the Company, to it by notice to the Chief Executive Officer, c/o Genocea Biosciences, Inc. at its principal place of business.

16. At-Will Employment. The Company is excited about your employment and looks forward to a mutually beneficial and productive relationship. Nevertheless, you should be

aware that your employment with the Company is for no specified period, and constitutes at-will employment. You are free to resign at any time, for any reason or for no reason. Similarly, the Company is free to conclude its employment relationship with you at any time, with or without Cause, and with or without notice. Further, the Immigration Reform and Control Act requires the Company to verify your identity and employment eligibility within three business days of the Effective Date. Your employment is conditioned on your timely completion of a Form 1-9 and provision of the appropriate documents listed on that form.

If the foregoing is acceptable to you, please sign and date this letter in the spaces provided. If you sign and return this letter, this letter will take effect as a binding agreement between you and the Company on the basis set forth above and the terms hereof will be effective on the Effective Date. If you do not commence employment on the Effective Date, this letter shall terminate and be of no force and effect, without further action by the parties hereto, and you shall not be entitled to any of the compensation or benefits provided hereunder. The enclosed copy is for your records.

Sincerely,

/s/ William Clark

Name: William Clark

Title: President and Chief Executive Officer

Agreed to and accepted,

Signature: /s/ Girish Aakalu

Printed Name: Girish Aakalu, PhD

Date: 11/12/2018

September 17, 2018

Dear Tom:

This letter agreement (" Agreement ") sets forth the terms and conditions of your offer of employment with Genocea Biosciences, Inc. (the " Company "). If accepted, the terms hereof shall be effective and your employment shall commence on October 1, 2018 (the " Effective Date ").

1. **Position and Duties.** You shall serve, on a full-time basis, as the Company's Chief Medical Officer, reporting directly to the Company's Chief Executive Officer. You agree that while employed by the Company you shall devote your full business time and professional efforts to the performance of your duties and responsibilities to the Company; abide by all Company policies and procedures as in effect from time to time; perform all of the customary duties of your position, which will include, but not be limited to, overseeing the Company's clinical programs developing the Company's pipeline while prioritizing scientific integrity and patient-centricity, providing strategic and clinical perspectives (from conception through implementation) for an array of research programs spanning early feasibility to pivotal Company studies for regulatory registration.

2. **Compensation and Benefits.** During your employment, as compensation for all services performed by you for the Company and subject to the performance of your duties and responsibilities to the Company pursuant to this Agreement or otherwise, the Company will provide you with the following compensation and benefits:

(a). **Base Salary.** The Company shall pay you a Base Salary at the rate of $425,000 per year in accordance with the Company's standard payroll practices, as in effect from time to time but at least on a semi-monthly basis ("Base Salary"). The Company shall review your Base Salary on an annual basis for upward adjustment. Any adjustments will be determined by the Company, in its sole discretion.

(b). **Annual Bonus Compensation.** You are eligible to receive a performance-based annual bonus with a target of 40% of your Base Salary in effect as of December 31 of the previous calendar year (the " Target Bonus "). Your annual bonus, if any, for any year will be determined by the Board of Directors of the Company (the " Board ") or the Compensation Committee of the Board (the " Committee ") in accordance with the Company's annual bonus plan as in effect from time to time and will be based on performance criteria established by the Board or the Committee and disclosed to you within sixty (60) days of the beginning of each calendar year Any bonus due to you hereunder will be paid not later than March 15 th of the year following the year to which the bonus relates. For 2018, you will advised of your performance criteria within thirty days of your start date and be entitled to a pro-rated Target Bonus. In the event you are otherwise eligible to receive a Target Bonus and the Company terminates your

employment without Cause or you terminate your employment for Good Reason (as defined below) following the conclusion of given calendar year, you will receive your full Target Bonus for that year and receive a pro-rated Target Bonus for the year (to be paid the subsequent year in accordance with the Company's payment practices) in which your termination or resignation occurs based upon the number of days worked in such year. In the event your employment is terminated for Cause or you resign without Good Reason, you will not receive any Target Bonus from the Company. The foregoing shall be construed and applied so that any bonus payable to you hereunder qualifies as a "short-term deferral" under Section 409A.

(c). **Signing Bonus.** The Company shall pay you a cash signing bonus in the amount of $25,000 (the "Signing Bonus") payable on the first payroll date following the Effective Date. In the event you receive the Signing Bonus but voluntarily terminate your employment without Good Reason (as defined below) within twelve months after the Effective Date, then you shall pay back to the Company a pro-rated portion of the Signing Bonus based upon the number of days remaining in this twelve-month period prior to termination of employment. You must pay this pro-rated portion to the Company within 30 days of the date of such termination of employment. You will not be required to repay the Signing Bonus in the event of termination of employment under any other circumstances.

(d). **Stock Option Award** . Subject to approval by the Board, at the first regularly scheduled meeting of the Board following the Effective Date, you will be eligible to receive a stock option award under the Company's equity plan then in effect with respect to 500,000 shares of common stock of the Company (" Common Stock "), with an exercise price that is no less than the fair market value of a share of Common Stock on the date of grant. To be eligible to receive this stock option award, you must be employed by the Company on the date the award is granted. The stock option award will be subject to the terms of the Company's equity plan under which it is granted and the terms of the award agreement evidencing such stock option.

(e). **Benefits.** As an employee, you will also be eligible to participate in the Company's standard employee benefit plans and programs as in effect from time to time for employees of the Company generally, except to the extent such plans or programs are duplicative of benefits otherwise provided to you under this Agreement (e.g., severance pay) or under any other agreement. Your participation in such plans or programs will be subject to the terms of the applicable plan documents and generally applicable Company policies.

(f). **Vacation.** You will be entitled to four (4) weeks of paid vacation, to be taken at such time or times as the needs of the Company's business reasonably permit and in accordance with the Company's policies from time to time in effect. You will be allowed to carry over one week of unused vacation from one year to the next.

(g). **Travel Expenses.** The Company recognizes that you will be working from your home office in Maryland and travelling to the Company's Headquarters as needed by the Company. Accordingly, the Company shall reimburse your reasonable travel expenses (including airfare and accommodations) to and from our Headquarters for the first year of employment.

(h). **Insurance.** You shall be entitled to liability insurance coverage on the same basis as other officers of the Company as to your acts or omissions to act during your employment with the Company as a manager or officer of the Company,

3. **At-Will Employment, Confidential Information, Invention Assignment, Non-Competition, and Nondisclosure** . As a condition of your employment, you will be required to enter into an At-Will Employment, Confidential Information, Invention Assignment and Non-Competition Agreement with the Company (the " Restricted Activities Agreement "), which will require, among other provisions, the assignment of patent rights to any invention made during your employment with the Company and nondisclosure of Company proprietary information and will contain an agreement not to engage in competitive activities with the Company during the 12-month period following the termination of your employment for any reason. You will also be required to enter into a Nondisclosure Agreement with the Company (the " Nondisclosure Agreement "). Your employment with the Company and the receipt of any severance payments or benefits under Section 5 of this Agreement are each conditioned upon and subject to your compliance with the Restricted Activities Agreement and the Nondisclosure Agreement.

4. **Termination of Employment.** Your employment under this Agreement shall continue until terminated pursuant to this Section 4.

(a). **Termination for Cause.** The Company may terminate your employment for Cause, as defined below, upon written notice to you setting forth in reasonable detail the nature of the Cause. The following, as determined by the Board in its reasonable judgment, shall constitute " Cause " for termination:

(i). the indictment or conviction for, any felony or any other crime involving dishonesty;

(ii). participation in any fraud, deliberate and substantial misconduct, breach of duty of loyalty or breach of fiduciary duty against the Company or any Affiliate;

(iii). intentional and material damage to any property of the Company or any Affiliate;

(iv). serious and intentional or willful misconduct against the Company or any of its employees; or

(v). your breach of any material provision of this Agreement, the Restricted Activities Agreement, or the Nondisclosure Agreement.

Termination of your employment by the Company for Cause will result in no severance pay or severance benefits. In the case of termination for Cause under Section 4(a)(iii) and 4(a)(v), the Company will notify you of the conditions for such termination no later than 30 days following

the occurrence of the condition and shall provide you with 10 days to remedy the condition in the event such condition is curable.

(a). **Termination without Cause.** The Company may terminate your employment at any time other than for Cause upon 30 days' written notice to you.

(b). **Termination for Good Reason.** You may terminate your employment hereunder for Good Reason, as defined below, by providing written notice to the Company of the condition giving rise to the Good Reason, specifying in detail the basis for such claim of Good Reason, no later than 30 days following the occurrence of the condition, by giving the Company 30 days to remedy the condition and by terminating employment for Good Reason within 30 days thereafter if the Company fails to remedy the condition. The following, if occurring without your consent, shall constitute " Good Reason " for termination by you:

(i). material diminution of your duties to the Company;

(ii). a material reduction in your Base Salary, or Target Bonus percentage of 40% (with materiality being defined for purposes of this subsection as five percent (5%) or more of the existing salary or Target Bonus percentage);

(iii). a requirement that you relocate your primary residence from Maryland in order to accomplish your work for the Company;

(iv). the failure of the Company to pay or to provide any of the compensation or benefits (including without limitation the compensation and benefits set forth in Section 2 of this Agreement) when due; for the avoidance of doubt, you understand that a good faith change in the Company's standard benefit plans and programs will not been deemed to constitute "Good Reason";

(v). any directive given to you by the Company in conflict with your professional medical obligations or otherwise in violation of any law, regulation or Company policy; or

(vi). a breach by the Company of a material provision of this Agreement.

(c). **Termination without Good Reason.** You may terminate your employment with the Company other than for Good Reason at any time upon 30 days' written notice to the Company.

(d). **Termination Due to Death or Disability.** This Agreement shall automatically terminate in the event of your death during employment. The Company may also terminate your employment, upon notice to you, in the event you become disabled during employment. For purposes of this Agreement, Disability is defined as any illness, accident, injury or condition of

either a physical or psychological nature the onset of which renders you unable to continue to perform substantially all of your duties and responsibilities under this Agreement (notwithstanding the provision of any reasonable accommodation) for 180 days (whether or not consecutive) during any period of 365 consecutive calendar days. If any question shall arise as to whether you are disabled to the extent that you are unable to perform substantially all of your duties and responsibilities for the Company and its Affiliates, you shall, at the Company's request and expense, submit to a medical examination by a physician selected by the Company and such determination shall, for the purposes of this Agreement, be conclusive of the issue. If such a question arises and you fail to submit to the requested medical examination, the Company's determination of the issue shall be binding on you.

5. **Severance and other Matters Related to Termination.**

(a). **Termination by the Company without Cause or by you for Good Reason.** Subject to Section 5(b), Section 5(f) and Section 11, in the event that your employment is terminated by the Company without Cause pursuant to Section 4(b) or by you for Good Reason pursuant to Section 4(c), in addition to the Accrued Compensation (as defined below), which shall be paid at the time provided in Section 5(d) below, you shall be entitled to the severance payments and benefits specified below.

(i). the Company shall continue to pay you your Base Salary, at the rate then in effect, for the 9-month period following the date on which your employment with the Company terminates in accordance with the Company's standard payroll policy as then in effect and shall pay you the Target Bonus as further detailed in Section 2(b) above; and

(ii). subject to your timely election to continue participation in the Company's group health and dental plans under COBRA, and only for so long as you are eligible for such coverage through COBRA, the Company shall pay you, on a monthly and taxable basis, an amount equal to the full monthly premium cost of such participation until the conclusion of the nine-month period following the date on which your employment with the Company terminates, or, if earlier, until the date you become eligible to enroll in such plans of any new employer.

(b). **Termination by the Company without Cause or by you for Good Reason in connection with a Change of Control** . Subject to Section 5(f), and Section 11, in the event that your employment is terminated by the Company without Cause pursuant to Section 4(b) or by you for Good Reason pursuant to Section 4(c), in either case, within 12 months following a Change of Control, in addition to the Accrued Compensation (as defined below), which shall be paid at the time specified in Section 5(d) below, in lieu of any payments and benefits provided in Section 5(a) above, you shall be entitled to the severance payments and benefits specified below:

(i). the Company shall continue to pay you your Base Salary, at the rate then in effect, for the 15-month period following the date on which your employment with the Company terminates in accordance with the Company's standard payroll policy as then in effect;

(ii). subject to your timely election to continue participation in the Company's group health and dental plans under COBRA, and only for so long as you are eligible for such

coverage through COBRA, the Company shall pay you, on a monthly and taxable basis, an amount equal to the full monthly premium cost of such participation until the conclusion of the 15-month period following the date on which your employment with the Company terminates, or, if earlier, until the date you become eligible to enroll in such plans of any new employer; and

(iii). all outstanding and unvested stock options and other equity awards then held by you will become fully vested and exercisable and, with respect to any stock options then held by you, shall remain exercisable for the period of time set forth in the applicable grant agreement.

(a). **Termination by the Company due to your Disability or due to your Death.** Subject to Section 5(f) and Section 11, in the event your employment with the Company is terminated by the Company due to your Disability (as defined above) or is terminated due to your death, in either case, pursuant to Section 4(e), in addition to the Accrued Compensation (as defined below), which shall be paid at the time specified in Section 5(d), the Company shall pay you at the same time as the Accrued Compensation is paid a pro-rata annual bonus for the year in which such termination of employment occurs, calculated by multiplying your target annual bonus for such year by a fraction, the numerator of which is the number of days you were employed during such year and the denominator of which is 365 (the " Pro-Rata Bonus ").

(b). **Any Termination.** In the event your employment with the Company terminates for any reason, in addition to the compensation set forth above in connection with a termination without Cause or for Good Reason, the Company shall pay you on the first payroll date that follows the date of the termination of your employment (or on such earlier date as is required by law) the Accrued Compensation. For purposes of this Agreement, " Accrued Compensation " means any Base Salary earned but not paid through the date of the termination of employment and an amount equal to the value of any vacation time accrued but unused as of such date.

(c). **Parachute Payments.**

(i). In the event of the consummation of a change in ownership or control within the meaning of Section 280G (a " 280G Change in Control ") of the Company following the time that the Company has stock readily tradeable on an established securities market (within the meaning of Section 280G and the regulations thereunder), if all or a portion of the payments and benefits under this Agreement, together with any other payments and benefits provided to you by the Company or its Affiliates (including, without limitation, any accelerated vesting of stock options and other equity awards) (the " Total Payments "), would constitute an "excess parachute payment" within the meaning of Section 280G (the aggregate of such payments (or portions thereof) being hereinafter referred to as the " Excess Parachute Payments "), you will be entitled to receive (A) an amount limited so that no portion thereof shall fail to be tax deductible under Section 280G (the " Limited Amount "), or (B) if the amount otherwise payable hereunder or otherwise (without regard to clause (A)) reduced by all taxes applicable thereto (including, for the avoidance of doubt, the excise tax levied under Section 4999 of the Code (the " Excise Tax ")) would be greater than the Limited Amount reduced by all taxes applicable thereto, the amount otherwise payable hereunder or otherwise.

(ii). The determination as to whether the Total Payments include Excess Parachute Payments and, if so, the amount of such Excess Parachute Payments, the amount of any Excise Tax with respect thereto, and the amount of any reduction in Total Payments shall be made at the Company's expense by the independent public accounting firm most recently serving as the Company's outside auditors or such other accounting or benefits consulting group or firm as the Company may designate (the " Accountants "). In the event that any payments under this Agreement or otherwise are required to be reduced as described in Section 5(e)(i), the adjustment will be made, first, by reducing the amount of Base Salary payable pursuant to Section 5(a)(i) or Section 5(b)(i), as applicable; second, if additional reductions are necessary, by reducing the payment of the amounts due to you pursuant to Section 5(a)(ii) or Section 5(b)(ii), as applicable; and third, if additional reductions are still necessary, by eliminating the accelerated vesting of stock option awards and other equity awards, if any, starting with those awards for which the amount required to be taken into account under Section 280G is the greatest.

(iii). In the event that there has been an underpayment or overpayment under this Agreement or otherwise as determined by the Accountants, the amount of such underpayment or overpayment shall forthwith be paid to you or refunded to the Company, as the case may be, with interest at the applicable federal rate provided for in Section 7872(f)(2) of the Code.

(d). **Release.** Any obligation of the Company to provide you severance payments or other benefits (including accelerated vesting of stock options and other equity awards) or any Pro-Rata Bonus under this Section 5 (for the avoidance of doubt, other than Accrued Compensation), is conditioned on your (or your legal representative, if applicable, in the case of a termination due to your death or disability pursuant to Section 4(e)) signing a release of claims in the form provided by the Company (the " Release ") following the termination of your employment within a period of time not to exceed 45 days from the date of your receipt of such Release, and on your (or your legal representative, if applicable) not revoking the Release within the revocation period provided therein following your (or your legal representative's, if applicable) execution of the Release, which release shall not apply to (i) claims for indemnification in your capacity as an officer or director of the Company under the Company's Certificate of Incorporation, Bylaws or written agreement, if any, providing for director or officer indemnification, (ii) rights to receive insurance payments under any policy maintained by the Company and (iii) rights to receive retirement benefits that are accrued and fully vested at the time of your termination. Except as otherwise provided in Section 11 of this Agreement, any payments to be made in the form of salary continuation pursuant to the terms of this Agreement shall be payable in accordance with the normal payroll practices of the Company, with the first such payment (which shall be retroactive to the day immediately following the date of your termination of employment) due and payable as soon as administratively practicable following the date the Release becomes effective, but not later than the date that is 60 days following the date your employment terminates. Notwithstanding the foregoing, if the date your employment terminates occurs in one taxable year and the date that is 60 days following such termination date occurs in a second taxable year, to the extent required by Section 409A, such first payment shall not be made prior to the first day of the second taxable year. For the avoidance of doubt, if you (or your legal representative, if applicable) do not execute an Release within the period specified

in this Section 5(f), or if you (or your legal representative, if applicable) revoke the executed Release within the time period permitted by law, you will not be entitled to any payments or benefits (including the accelerated vesting of stock options or other equity awards) or any Pro-Rata Bonus set forth in this Section 5 (other than the Accrued Compensation), any stock options and other equity awards that vested on account of such termination as provided for in this Agreement shall be cancelled with no consideration due to you, and neither the Company nor any of its Affiliates will have any further obligations to you under this Agreement or otherwise. You agree to provide the Company prompt notice of your eligibility to participate in the health and, if applicable, dental, plan of any employer. You further agree to repay any overpayment of health and, if applicable, dental, benefit premiums made by the Company hereunder. Notwithstanding anything to the contrary herein, in the event that the Company's payment of the amounts described in Section 5(a)(ii) or Section 5(b)(ii), as applicable, would subject the Company to any tax or penalty under the Patient Protection and Affordable Care Act (as amended from time to time, the "ACA") or Section 105(h) of the Internal Revenue Code of 1986, as amended ("Section 105(h)"), or applicable regulations or guidance issued under the ACA or Section 105(h), you and the Company agree to work together in good faith to restructure such benefit.

(e). **Survival, Conditions to Severance.** Provisions of this Agreement shall survive any termination if so provided in this Agreement or if necessary or desirable to accomplish the purposes of other surviving provisions, including without limitation your obligations under Section 3 of this Agreement and under the Restricted Activities Agreement and the Nondisclosure Agreement. The obligation of the Company to make payments to you or on your behalf under Section 5 of this Agreement is expressly conditioned upon (i) your full performance of your obligations under Section 3 hereof pursuant to the Restricted Activities Agreement and the Nondisclosure Agreement and under any subsequent agreement between you and the Company or any of its Affiliates relating to confidentiality, non-competition, proprietary information or the like, and (ii) your (or your legal representative's, if applicable, in the case of a termination due to your death or disability pursuant to Section 4(e)) timely execution and non-revocation of the Release as set forth in Section 5(f).

6. **Definitions** . For purposes of this Agreement, the following definitions apply:

(a). " Affiliates " means all persons and entities directly or indirectly controlling, controlled by or under common control with the Company, where control may be by management authority, equity interest or otherwise.

(b). " Change of Control " means the first to occur of any of the following: (i) a merger or consolidation in which (A) the Company is a constituent party, or (B) a subsidiary of the Company is a constituent party and the Company issues shares of its capital stock pursuant to such merger or consolidation, except in the case of either clause (A) or (B) any such merger or consolidation involving the Company or a subsidiary of the Company in which the beneficial owners of the shares of capital stock of the Company outstanding immediately prior to such merger or consolidation continue beneficially to own, immediately following such merger or consolidation, at least a majority by voting power of the capital stock of (x) the surviving or

resulting corporation or (y) if the surviving or resulting corporation is a wholly owned subsidiary of another corporation immediately following such merger or consolidation, the parent corporation of such surviving or resulting corporation; (ii) the sale, lease, transfer, exclusive license or other disposition, in a single transaction or series of related transactions, by the Company or a Company subsidiary of all or substantially all the assets of the Company and the Company subsidiaries taken as a whole (except in connection with a merger or consolidation not constituting a Change of Control under clause (i) or where such sale, lease, transfer, exclusive license or other disposition is to a wholly owned Company subsidiary); or (iii) the sale or transfer, in a single transaction or series of related transactions, by the stockholders of the Company of more than 50% by voting power of the then-outstanding capital stock of the Company to any Person or entity or group of affiliated Persons or entities.

(c). " Code " means the Internal Revenue Code of 1986, as amended.

(d). " Person " means an individual, a corporation, an association, a partnership, an estate, a trust and any other entity or organization, other than the Company or any of its Affiliates.

(e). " Section 280G " means Section 280G of the Code, together with the regulations thereunder.

(f). " Section 409A " means Section 409A of the Code, together with the regulations thereunder.

7. **Conflicting Agreements** . You hereby represent and warrant that your signing of this Agreement and the performance of your obligations under it will not breach or be in conflict with any other agreement to which you are a party or are bound and that you are not now subject to any covenants against competition or similar covenants or any court order that could affect the performance of your obligations under this Agreement. You agree that, during the term of your employment with the Company, you will not engage in any other employment, occupation, consulting or other business activity directly related to the business in which the Company is now involved or becomes involved during the term of your employment, nor will you engage in any other activities that conflict with your obligations to the Company. Notwithstanding the foregoing, nothing in this Agreement shall prevent you from serving as an advisor or director for any for-profit businesses or non-profit organization or serving in various other capacities in community, civic, religious, charitable or trade organizations, provided that such participation does not, individually or in the aggregate, materially interfere or conflict with the performance of your duties hereunder. You further agree not to disclose or use on behalf of the Company any proprietary or confidential information of a third party, including that of any former employer, without such third party's consent.

8. **Withholding; Other Tax Matters.** Anything to the contrary notwithstanding, all payments required to be made by the Company hereunder to you shall be subject to the withholding of such amounts, if any, relating to tax and other payroll deductions as the Company may determine it should withhold pursuant to any applicable law or regulation.

9. **Assignment** . Neither you nor the Company may make any assignment of this Agreement or any interest in it, by operation of law or otherwise, without the prior written consent of the other; provided, however, that the Company may assign its rights and obligations under this Agreement without your consent to one of its Affiliates or to any Person with or into which the Company hereafter affects a reorganization, consolidates or merges, or to which it transfers all or substantially all of its properties or assets. This Agreement shall inure to the benefit of and be binding upon you and the Company and each of its respective successors, executors, administrators, heirs and permitted assigns.

10. **Severability** . If any portion or provision of this Agreement shall to any extent be declared illegal or unenforceable by a court of competent jurisdiction, then the remainder of this Agreement, or the application of such portion or provision in circumstances other than those as to which it is so declared illegal or unenforceable, shall not be affected thereby, and each portion and provision of this Agreement shall be valid and enforceable to the fullest extent permitted by law.

11. **Section 409A.**

(a). You and the Company agree that this Agreement shall be interpreted to comply with or be exempt from Section 409A, and the regulations and guidance promulgated thereunder to the extent applicable, and all provisions of this Agreement shall be construed in a manner consistent with the requirements for avoiding taxes or penalties under Section 409A.

(b). A termination of employment shall not be deemed to have occurred for purposes of any provision of this Agreement providing for the payment of any amounts or benefits considered "nonqualified deferred compensation" under Section 409A upon or following a termination of employment unless such termination is also a "separation from service" within the meaning of Section 409A (after giving effect to the presumptions contained therein) and, for purposes of any such provision of this Agreement, references to a "termination", "termination of employment" or like terms shall mean "separation from service". If you are deemed on the date of termination to be a "specified employee" within the meaning of that term under Section 409A(a)(2)(B), then with regard to any payment or the provision of any benefit that is considered nonqualified deferred compensation under Section 409A payable on account of a "separation from service", such payment or benefit shall be made or provided at the date which is the earlier of (a) the expiration of the six-month period measured from the date of such "separation from service", and (b) the date of your death (the " Delay Period "). Upon the expiration of the Delay Period, all payments and benefits delayed pursuant to this Section 11(b) (whether they would have otherwise been payable in a single sum or in installments in the absence of such delay) shall be paid or reimbursed on the first business day following the expiration of the Delay Period to you in a lump sum, and any remaining payments and benefits due under this Agreement shall be paid or provided in accordance with the normal payment dates specified for them herein.

(c). With regard to any provision herein that provides for payment or reimbursement of costs and expenses or in-kind benefits, except as permitted by Section 409A, (a) the right to payment, reimbursement or in-kind benefits shall not be subject to liquidation or exchange for another benefit; (b) the amount of expenses eligible for payment or reimbursement, or in-kind

benefits, provided during any taxable year shall not affect the expenses eligible for payment or reimbursement, or in-kind benefits, to be provided in any other taxable year; and (c) such payments shall be made on or before the last day of your taxable year following the taxable year in which the expense occurred.

(d). For purposes of Section 409A, your right to receive any installment payments pursuant to this Agreement shall be treated as a right to receive a series of separate and distinct payments.

(e). In no event shall the Company or any of its Affiliates have any liability relating to the failure or alleged failure of any payment or benefit under this Agreement to comply with, or be exempt from, the requirements of Section 409A.

12. **Entire Agreement** . This Agreement, together with the Restricted Activities Agreement and the Nondisclosure Agreement, sets forth the entire agreement between you and the Company and replaces and supersedes all prior communications, agreements and understandings, written or oral, with respect to the terms and conditions of your employment.

13. **Amendment** . This Agreement may not be modified or amended, and no breach shall be deemed to be waived, except by a written agreement signed by an authorized representative of the Company and you.

14. **Miscellaneous** . The headings and captions in this Agreement are for convenience only and in no way define or describe the scope or content of any provision of this Agreement. This Agreement may be executed in two or more counterparts, each of which shall be an original and all of which together shall constitute one and the same instrument. This is a Massachusetts contract and shall be governed and construed in accordance with the laws of the Commonwealth of Massachusetts, without regard to the conflict-of-laws principles thereof.

15. **Notices** . Any notices provided for in this Agreement shall be in writing and shall be effective when delivered in person, consigned to a reputable national courier service for overnight delivery or deposited in the United States mail, postage prepaid, and addressed to you at your last known address on the books of the Company or, in the case of the Company, to it by notice to the Chief Executive Officer, c/o Genocea Biosciences, Inc. at its principal place of business.

16. **At-Will Employment** . The Company is excited about your employment and looks forward to a mutually beneficial and productive relationship. Nevertheless, you should be aware that your employment with the Company is for no specified period, and constitutes at-will employment. You are free to resign at any time, for any reason or for no reason. Similarly, the Company is free to conclude its employment relationship with you at any time, with or without Cause, and with or without notice. Further, the Immigration Reform and Control Act requires the Company to verify your identity and employment eligibility within three business days of the Effective Date. Your employment is conditioned on your timely completion of a Form I-9 and provision of the appropriate documents listed on that form.

If the foregoing is acceptable to you, please sign and date this letter in the spaces provided. If you sign and return this letter, this letter will take effect as a binding agreement between you and the Company on the basis set forth above and the terms hereof will be effective on the Effective Date. If you do not commence employment on the Effective Date, this letter shall terminate and be of no force and effect, without further action by the parties hereto, and you shall not be entitled to any of the compensation or benefits provided hereunder. The enclosed copy is for your records.

Sincerely,

/s/ William Clark

Name: William Clark

Title: President and Chief Executive Officer

Agreed to and accepted,

Signature: /s/ Thomas Davis

Printed Name: Thomas A. Davis, M.D.

Date: September 17, 2018

Exhibit 10.3

Name:	[_____]
Number of Restricted Stock Units subject to Award:	[_____]
Date of Grant:	[_____]

GENOCEA BIOSCIENCES, INC.

2014 EQUITY INCENTIVE PLAN

RESTRICTED STOCK UNIT AWARD AGREEMENT

This agreement (this " Agreement ") evidences an award (the " Award ") of restricted stock units granted by Genocea Biosciences, Inc. (the " Company ") to the individual named above (the " Grantee "), pursuant to and subject to the terms of the Genocea Biosciences, Inc. 2014 Equity Incentive Plan (as amended from time to time, the " Plan ").

1. Grant of Restricted Stock Unit Award . The Company grants to the Grantee on the date set forth above (the " Date of Grant ") the number of restricted stock units (the " Restricted Stock Units ") set forth above, giving the Grantee the conditional right to receive, without payment and pursuant to and subject to the terms set forth in this Agreement and in the Plan, one share of Stock (a " Share ") with respect to each Restricted Stock Unit, subject to adjustment pursuant to Section 7(b) of the Plan in respect of transactions occurring after the date hereof.

2. Meaning of Certain Terms . Except as otherwise defined herein, all capitalized terms used herein have the same meaning as in the Plan. The following terms have the following meanings:

(a) " Beneficiary " means, in the event of the Grantee's death, the beneficiary named in the written designation (in a form acceptable to the Administrator) most recently filed with the Administrator by the Grantee prior to the Grantee's death and not subsequently revoked, or, if there is no such designated beneficiary, the executor or administrator of the Grantee's estate. An effective beneficiary designation will be treated as having been revoked only upon receipt by the Administrator, prior to the Grantee's death, of an instrument of revocation in form acceptable to the Administrator.

3. Vesting; Cessation of Employment .

(a) Vesting . Unless earlier terminated, forfeited, relinquished or expired, one-fourth (1/4) of the Restricted Stock Units will vest on each of the first four (4) anniversaries of the Date of Grant, with the number of Restricted Stock Units that vested on any such date being rounded down to the nearest whole Restricted Stock Unit and the Award becoming vested as to one hundred percent (100%) of the Restricted Stock

Units on the fourth (4 th) anniversary of the Date of Grant, subject to the Grantee remaining in continuous Employment from the Date of Grant through the applicable vesting date.

(b) Forfeiture . Automatically and immediately upon the cessation of the Grantee's Employment (i) the unvested portion of the Award will terminate and be forfeited for no consideration, and (ii) the vested portion of the Award, if any, will terminate and be forfeited for no consideration if the Grantee's Employment is terminated in connection with an act or failure to act constituting Cause (as the Administrator, in its sole discretion, may determine), or such termination of Employment occurs in circumstances that in the determination of the Administrator would have entitled the Company and its subsidiaries to terminate the Grantee's Employment for Cause.

4. Delivery of Shares . Subject to Section 5 below, the Company shall, as soon as practicable upon the vesting of any portion of the Award (but in no event later than 30 days following the date on which such Restricted Stock Units vest), effect delivery of the Shares with respect to such vested Restricted Stock Units to the Grantee (or, in the event of the Grantee's death following the vesting of such portion of the Award, to the Grantee's Beneficiary). No Shares will be issued pursuant to the Award unless and until all legal requirements applicable to the issuance or transfer of such Shares have been complied with to the satisfaction of the Administrator.

5. Forfeiture; Recovery of Compensation . The Administrator may cancel, rescind, withhold or otherwise limit or restrict the Award at any time if the Grantee is not in compliance with all applicable provisions of this Agreement and the Plan. By accepting, or being deemed to have accepted, the Award, the Grantee expressly acknowledges and agrees that his or her rights, and those of any Beneficiary or permitted transferee of the Award, under the Award, including the right to any Shares acquired under the Award or proceeds from the disposition thereof, are subject to Section 6(a)(5) of the Plan (including any successor provision). Nothing in the preceding sentence may be construed as limiting the general application of Section 10 of this Agreement.

6. Dividends; Other Rights . The Award may not be interpreted to bestow upon the Grantee any equity interest or ownership in the Company or any subsidiary prior to the date on which the Company delivers Shares to the Grantee. The Grantee is not entitled to vote any Shares by reason of the granting of the Award or to receive or be credited with any dividends declared and payable on any Share prior to the date on which any such Share is delivered to the Grantee hereunder. The Grantee will have the rights of a shareholder only as to those Shares, if any, that are actually delivered under the Award.

7. Nontransferability . The Award may not be transferred except as expressly permitted under Section 6(a)(3) of the Plan.

8. Withholding . The Grantee expressly acknowledges that the vesting or settlement of the Restricted Stock Units acquired hereunder may give rise to "wages" subject to withholding. The Grantee expressly acknowledges and agrees that the Grantee's rights hereunder, including the right to receive Shares following the vesting of any portion of the Award, are subject to the satisfaction of all taxes required to be withheld with respect to the Award. Unless otherwise determined by the

Company, the Company shall automatically satisfy these tax withholding obligations by withholding from the Shares that would otherwise be delivered in connection with such vesting date a number of Shares having a fair market value equal to the minimum statutory amount required to be withheld to satisfy such tax withholding obligations and/or by causing such number of Shares to be sold in accordance with a sell-to-cover arrangement. The Grantee authorizes the Company and its subsidiaries to withhold any amounts due in respect of any required tax withholdings by withholding from the Shares otherwise deliverable in connection with this Award, by causing such Shares to be sold in accordance with a sell-to-cover arrangement and/or by withholding from any amounts otherwise owed to the Grantee. Nothing in this Section 8 shall be construed as relieving the Grantee of any liability for satisfying his or her tax obligations relating to the Award.

9. Effect on Employment . Neither the grant of the Award, nor the issuance of Shares upon the vesting of the Award, will give the Grantee any right to be retained in the employ or service of the Company or any of its subsidiaries, affect the right of the Company or any of its subsidiaries to terminate the Employment of the Grantee at any time, or affect any right of the Grantee to terminate his or her Employment at any time.

10. Provisions of the Plan . This Agreement is subject in its entirety to the provisions of the Plan, which are incorporated herein by reference. A copy of the Plan as in effect on the Date of Grant has been furnished to the Grantee. By accepting, or being deemed to have accepted, all or any portion of the Award, the Grantee agrees to be bound by the terms of the Plan and this Agreement. In the event of any conflict between the terms of this Agreement and the Plan, the terms of the Plan will control.

11. Acknowledgements . The Grantee acknowledges and agrees that (i) this Agreement may be executed in two or more counterparts, each of which will be an original and all of which together will constitute one and the same instrument, (ii) this Agreement may be executed and exchanged using facsimile, portable document format (PDF) or electronic signature, which, in each case, will constitute an original signature for all purposes hereunder, and (iii) such signature by the Company will be binding against the Company and will create a legally binding agreement when this Agreement is countersigned by the Grantee.

[Signature page follows.]

The Company, by its duly authorized officer, and the Grantee have executed this Agreement as of the date first set forth above.

GENOCEA BIOSCIENCES, INC.

By: _____

Name: _____

Title: _____

Agreed and Accepted:

By_____
[_____]

Exhibit 31.1

CERTIFICATION PURSUANT TO
SECURITIES EXCHANGE ACT RULES 13a-14 and 15d-14
AS ADOPTED PURSUANT TO
SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, William D. Clark , President and Chief Executive Officer and Director , certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Genocea Biosciences, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

    a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant is made known to us by others within those entities, particularly during the period in which this report is being prepared;

    b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

    c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures as of the end of the period covered by this report based on such evaluation; and

    d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

    a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

    b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

/s/ WILLIAM D. CLARK

William D. Clark
President and Chief Executive Officer and Director
(Principal Executive Officer)

Date: April 30, 2020

Exhibit 31.2

CERTIFICATION PURSUANT TO
SECURITIES EXCHANGE ACT RULES 13a-14 and 15d-14
AS ADOPTED PURSUANT TO
SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Diantha Duvall , Chief Financial Officer (Principal Financial and Accounting Officer) , certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Genocea Biosciences, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

    a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant is made known to us by others within those entities, particularly during the period in which this report is being prepared;

    b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

    c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures as of the end of the period covered by this report based on such evaluation; and

    d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

    a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

    b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

/s/ DIANTHA DUVALL

Diantha Duvall

Chief Financial Officer (Principal Financial and Accounting Officer)

Date: April 30, 2020

Exhibit 32.1

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Quarterly Report on Form 10-Q of Genocea Biosciences, Inc. (the "Company") for the period ended March 31, 2020 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, the undersigned, William D. Clark , as the President and Chief Executive Officer and Director of the Company, does hereby certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to the best of my knowledge:

(1) The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

/s/ WILLIAM D. CLARK

William D. Clark
President and Chief Executive Officer and Director
(Principal Executive Officer)

Date: April 30, 2020

* A signed original of this written statement required by Section 906 has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.

The foregoing certification is being furnished solely pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 (subsections (a) and (b) of Section 1350, Chapter 63 of Title 18, United States Code) and is not being filed as part of the Form 10-Q or as a separate disclosure document.

Exhibit 32.2

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Quarterly Report on Form 10-Q of Genocea Biosciences, Inc. (the "Company") for the period ended March 31, 2020 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, the undersigned, Diantha Duvall , as the Chief Financial Officer of the Company, do hereby certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to the best of my knowledge:

(1) The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

/s/ DIANTHA DUVALL

Diantha Duvall

Chief Financial Officer (Principal Financial and Accounting Officer)

Date: April 30, 2020

*A signed original of this written statement required by Section 906 has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.

The foregoing certification is being furnished solely pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 (subsections (a) and (b) of Section 1350, Chapter 63 of Title 18, United States Code) and is not being filed as part of the Form 10-Q or as a separate disclosure document.