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

Form 10-Q

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

For the quarterly period ended March 31, 2020

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

For the transition period from to

Commission File No. 001-36847

Invitae Corporation
(Exact name of the registrant as specified in its charter)

Delaware	**27-1701898**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**

1400 16th Street, San Francisco, California 94103
(Address of principal executive offices, Zip Code)

(415) 374-7782
(Registrant's telephone number, including area code)

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

Title of each class	Trading Symbol	Name of exchange on which registered
Common Stock, $0.0001 par value per share	NVTA	New York Stock Exchange

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 ☒ 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 ☒ No ☐

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

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

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised 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 ☒

The number of shares of the registrant's common stock outstanding as of May 1, 2020 was 125,012,944.

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PART I — Financial Information

ITEM 1. Consolidated Financial Statements.

INVITAE CORPORATION

Condensed Consolidated Balance Sheets
(in thousands)
(unaudited)

	March 31, 2020	December 31, 2019
Assets		
Current assets:		
Cash and cash equivalents	$ 90,220	$ 151,389
Marketable securities	204,388	240,436
Accounts receivable	37,734	32,541
Prepaid expenses and other current assets	25,085	18,032
Total current assets	357,427	442,398
Property and equipment, net	41,085	37,747
Operating lease assets	37,588	36,640
Restricted cash	6,343	6,183
Intangible assets, net	163,378	125,175
Goodwill	177,432	126,777
Other assets	7,635	6,681
Total assets	$ 790,888	$ 781,601
Liabilities and stockholders' equity		
Current liabilities:		
Accounts payable	$ 25,982	$ 10,321
Accrued liabilities	88,793	64,814
Operating lease obligations	5,125	4,870
Finance lease obligations	1,370	1,855
Total current liabilities	121,270	81,860
Operating lease obligations, net of current portion	42,767	42,191
Finance lease obligations, net of current portion	1,019	1,155
Convertible senior notes, net	272,387	268,755
Deferred tax liability	10,250	—
Other long-term liabilities	17,062	8,000
Total liabilities	464,755	401,961
Commitments and contingencies (Note 8)		
Stockholders' equity:		
Common stock	10	10
Accumulated other comprehensive income (loss)	1,294	(9)
Additional paid-in capital	1,182,033	1,138,316
Accumulated deficit	(857,204)	(758,677)
Total stockholders' equity	326,133	379,640
Total liabilities and stockholders' equity	$ 790,888	$ 781,601

See accompanying notes to unaudited condensed consolidated financial statements.

INVITAE CORPORATION

Condensed Consolidated Statements of Operations
(in thousands, except per share amounts)
(unaudited)

	Three Months Ended March 31,	
	2020	**2019**
Revenue:		
Test revenue	$ 63,078	$ 39,619
Other revenue	1,170	934
Total revenue	64,248	40,553
Cost of revenue	40,422	21,254
Research and development	55,668	17,994
Selling and marketing	42,120	24,193
General and administrative	23,822	13,319
Loss from operations	(97,784)	(36,207)
Other income, net	4,708	638
Interest expense	(5,451)	(2,108)
Net loss	$ (98,527)	$ (37,677)
Net loss per share, basic and diluted	$ (0.99)	$ (0.47)
Shares used in computing net loss per share, basic and diluted	99,632	79,369

See accompanying notes to unaudited condensed consolidated financial statements.

INVITAE CORPORATION

Condensed Consolidated Statements of Comprehensive Loss
(in thousands)
(unaudited)

	Three Months Ended March 31,	
	2020	**2019**
Net loss	$ (98,527)	$ (37,677)
Other comprehensive income:		
Unrealized income on available-for-sale marketable securities, net of tax	1,303	13
Comprehensive loss	$ (97,224)	$ (37,664)

See accompanying notes to unaudited condensed consolidated financial statements.

INVITAE CORPORATION

Condensed Consolidated Statements of Stockholders' Equity
(in thousands)
(unaudited)

	Three Months Ended March 31,	
	2020	**2019**
Common stock:		
Balance, beginning of period	$ 10	$ 8
Common stock issued	—	1
Balance, end of period	10	9
Accumulated other comprehensive income (loss):		
Balance, beginning of period	(9)	(5)
Unrealized income on available-for-sale marketable securities, net of tax	1,303	13
Balance, end of period	1,294	8
Additional paid-in capital:		
Balance, beginning of period	1,138,316	678,548
Common stock issued in connection with public offering, net	—	184,490
Common stock issued on exercise of stock options, net	1,145	2,019
Common stock issued pursuant to exercises of warrants	27	88
Common stock issued or issuable pursuant to business combinations	42,453	416
Stock-based compensation expense	10,479	5,223
Reclassification of stock payable liabilities	(10,387)	—
Balance, end of period	1,182,033	870,784
Accumulated deficit:		
Balance, beginning of period	(758,677)	(516,712)
Net loss	(98,527)	(37,677)
Balance, end of period	(857,204)	(554,389)
Total stockholders' equity	$ 326,133	$ 316,412

See accompanying notes to unaudited condensed consolidated financial statements.

INVITAE CORPORATION

Condensed Consolidated Statements of Cash Flows
(in thousands)
(unaudited)

	Three Months Ended March 31,	
	2020	**2019**
Cash flows from operating activities:		
Net loss	$ (98,527)	$ (37,677)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization	6,056	3,286
Stock-based compensation	29,278	5,223
Amortization of debt discount and issuance costs	3,632	—
Remeasurements of liabilities associated with business combinations	(3,367)	(130)
Other	(659)	388
Changes in operating assets and liabilities, net of businesses acquired:		
Accounts receivable	(5,167)	2,596
Prepaid expenses and other current assets	(7,053)	(3,365)
Other assets	602	1,019
Accounts payable	13,085	(307)
Accrued expenses and other liabilities	(240)	601
Net cash used in operating activities	(62,360)	(28,366)
Cash flows from investing activities:		
Purchases of marketable securities	—	(20,781)
Proceeds from sales of marketable securities	12,532	—
Proceeds from maturities of marketable securities	24,965	6,000
Acquisition of businesses, net of cash acquired	(32,199)	—
Purchases of property and equipment	(3,831)	(2,764)
Other	(667)	—
Net cash provided by (used in) investing activities	800	(17,545)
Cash flows from financing activities:		
Proceeds from public offerings of common stock, net	—	184,490
Proceeds from issuance of common stock, net	1,172	2,107
Finance lease principal payments	(621)	(477)
Net cash provided by financing activities	551	186,120
Net increase (decrease) in cash, cash equivalents and restricted cash	(61,009)	140,209
Cash, cash equivalents and restricted cash at beginning of period	157,572	118,164
Cash, cash equivalents and restricted cash at end of period	$ 96,563	$ 258,373
Supplemental cash flow information of non-cash investing and financing activities:		
Purchases of property and equipment in accounts payable and accrued liabilities	$ 3,956	$ 2,389
Common stock issued for acquisition of businesses	$ 42,453	$ 416
Consideration payable for acquisition of businesses	$ 5,773	$ —
Operating lease assets obtained in exchange for lease obligations, net	$ 2,131	$ 1,617

See accompanying notes to unaudited condensed consolidated financial statements.

INVITAE CORPORATION

Notes to Condensed Consolidated Financial Statements

1. Organization and description of business

Invitae Corporation ("Invitae," “the Company," "we," "us," and "our") was incorporated in the State of Delaware on January 13, 2010, as Locus Development, Inc. and changed its name to Invitae Corporation in 2012. We utilize an integrated portfolio of laboratory processes, software tools and informatics capabilities to process DNA-containing samples, analyze information about patient-specific genetic variation and generate test reports for clinicians and patients. Our headquarters and main production facility is located in San Francisco, California. We currently have more than 20,000 genes in production and provide a variety of diagnostic tests that can be used in multiple indications. We offer genetic testing across multiple clinical areas, including hereditary cancer, cardiology, neurology, pediatrics, metabolic conditions and rare diseases. To augment our offering and realize our mission, we have acquired multiple assets including four businesses in 2017 which expanded our suite of genome management offerings and facilitated our entry into prenatal and perinatal genetic testing, and three businesses in 2019 to advance our Non-Invasive Prenatal Screen ("NIPS") offering at lower costs, further enhance our genetic variant interpretation and expand our ability to scale and deliver genetic information. In 2020, we acquired Orbicule BV operating under the name "Diploid" ("Diploid") to enable us to quickly diagnose genetic disorders using artificial intelligence, as well as Genelex Solutions, LLC ("Genelex") and YouScript Incorporated ("YouScript") to bring pharmacogenetic testing and integrated clinical decision support to Invitae. Invitae operates in one segment.

Basis of presentation

The accompanying unaudited condensed consolidated financial statements have been prepared in accordance with U.S. generally accepted accounting principles (“U.S. GAAP”) for interim financial information and in accordance with the instructions to Form 10-Q and Rule 10-01 of Regulation S-X. Accordingly, they do not include all of the information and footnotes required by generally accepted accounting principles for complete financial statements. The unaudited interim condensed consolidated financial statements have been prepared on the same basis as the annual financial statements. In the opinion of management, the accompanying unaudited condensed consolidated financial statements reflect all adjustments (consisting only of normal recurring adjustments) considered necessary for a fair presentation. The information included in this Quarterly Report on Form 10-Q should be read in conjunction with the audited financial statements and notes thereto included in our Annual Report on Form 10-K for the year ended December 31, 2019. The results for the three months ended March 31, 2020 are not necessarily indicative of the results expected for the full fiscal year or any other periods.

2. Summary of significant accounting policies

Principles of consolidation

Our unaudited condensed consolidated financial statements include our accounts and the accounts of our wholly-owned subsidiaries. All intercompany balances and transactions have been eliminated in consolidation.

Use of estimates

The preparation of financial statements in conformity with U.S. GAAP requires management to make judgments, estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent liabilities as of the date of the financial statements and the reported amounts of revenue and expenses during the reporting period. We base these estimates on current facts, historical and anticipated results, trends and various other assumptions that we believe are reasonable under the circumstances, including assumptions as to future events. Actual results could differ materially from those judgments, estimates and assumptions. We evaluate our estimates on an ongoing basis.

Concentrations of credit risk and other risks and uncertainties

Financial instruments that potentially subject us to a concentration of credit risk consist of cash, cash equivalents, marketable securities and accounts receivable. Our cash and cash equivalents are held by financial institutions in the United States. Such deposits may exceed federally insured limits.

Significant customers are those that represent 10% or more of our total revenue presented on the consolidated statements of operations. Our revenue from significant customers as a percentage of our total revenue was as follows:

	Three Months Ended March 31,	
	2020	2019
Medicare	21%	22%

Cash, cash equivalents and restricted cash

The following table provides a reconciliation of cash, cash equivalents and restricted cash reported within the consolidated balance sheets that sum to the total of the same amounts shown in the statements of cash flows (in thousands):

	March 31, 2020	December 31, 2019
Cash and cash equivalents	$ 90,220	$ 151,389
Restricted cash	6,343	6,183
Total cash, cash equivalents and restricted cash	$ 96,563	$ 157,572

Inventory

We maintain test reagents and other consumables primarily used in sample collection kits which are valued at the lower of cost or net realizable value. Cost is determined using actual costs on a first-in, first-out basis. Our inventory was $13.3 million and $6.6 million as of March 31, 2020 and December 31, 2019, respectively, and was recorded in prepaid expenses and other current assets on our consolidated balance sheets.

Fair value of financial instruments

Our financial instruments consist principally of cash and cash equivalents, marketable securities, accounts payable, accrued liabilities, finance leases and liabilities associated with business combinations. The carrying amounts of certain of these financial instruments, including cash and cash equivalents, accounts receivable, accounts payable and accrued and other current liabilities approximate their current fair value due to the relatively short-term nature of these accounts. Based on borrowing rates available to us, the carrying value of our finance leases approximate their fair values. Liabilities associated with business combinations are recorded at their estimated fair value.

Prior period reclassifications

We have reclassified certain amounts in prior periods to conform with current presentation.

Immaterial correction of an error

We determined the historical classification of certain acquisition-related obligations as equity and the subsequent measurement of such obligations was inappropriate and instead should have been classified as liabilities and subsequently measured at fair value with changes recognized in other income, net. We determined that the impact of the error to previously issued financial statements was not material and have corrected the immaterial error in the current period financial statements. The impact of this correction was an increase to other long-term liabilities of $10.1 million, a corresponding decrease to additional paid-in capital of $10.4 million and an increase to other income, net of $0.3 million.

Recent accounting pronouncements

We evaluate all Accounting Standards Updates (“ASUs”) issued by the Financial Accounting Standards Board ("FASB") for consideration of their applicability. ASUs not included in the disclosures in this report were assessed and determined to be either not applicable or are not expected to have a material impact on our consolidated financial statements.

Recently adopted accounting pronouncements

In June 2016, FASB issued ASU 2016-13, *Financial Instruments-Credit Losses (Topic 326),* which requires measurement and recognition of expected credit losses for financial assets. This guidance became effective for us beginning in the first quarter of 2020 and was adopted using a modified retrospective approach, with certain exceptions. The adoption of Topic 326 did not have a material impact on our consolidated financial statements as credit losses are not expected to be significant.

As part of our adoption of Topic 326, we assess our accounts receivables for expected credit losses at each reporting period by disaggregating by payer type and further by portfolios of customers with similar characteristics, such as customer type and geographic location. We then review each portfolio for expected credit losses based on historical payment trends as well as forward looking data and current economic trends. If a credit loss is determined, we record a reduction to our accounts receivable balance with a corresponding general and administrative expense.

In accordance with Topic 326, we no longer evaluate whether our available-for-sale debt securities in an unrealized loss position are other than temporarily impaired. Instead, we assess whether such unrealized loss positions are credit-related. Our expected loss allowance methodology for these securities is developed by reviewing the extent of the unrealized loss, the issuers' credit ratings and any changes in those ratings, as well as reviewing current and future economic market conditions and the issuers' current status and financial condition. The credit-related portion of unrealized losses, and any subsequent improvements, are recorded in interest income through an allowance account. Unrealized gains and losses that are not credit-related are included in accumulated other comprehensive income (loss).

3. Revenue, accounts receivable and deferred revenue

Test revenue is generated from sales of diagnostic tests to three groups of customers: institutions, such as hospitals, clinics and partners; patients who pay directly; and patients' insurance carriers. Amounts billed and collected, and the timing of collections, vary based on whether the payer is an institution, a patient or an insurance carrier. Other revenue consists principally of revenue recognized under collaboration and genome network agreements and is accounted for under the provisions provided in ASC 606, *Revenue from Contracts with Customers*.

The following table includes our revenues as disaggregated by payer category (in thousands):

	Three Months Ended March 31,	
	2020	2019
Test revenue:		
Institutions	$ 13,497	$ 8,154
Patient - direct	5,791	3,741
Patient - insurance	43,790	27,724
Total test revenue	63,078	39,619
Other revenue	1,170	934
Total revenue	$ 64,248	$ 40,553

We recognize revenue related to billings based on estimates of the amount that will ultimately be realized. Cash collections for certain diagnostic tests delivered may differ from rates originally estimated. As a result of new information, we updated our estimate of the amounts to be recognized for previously delivered tests which resulted in the following increases to revenue and decreases to our loss from operations and basic and diluted net loss per share (in millions, except per share amounts):

	Three Months Ended March 31,	
	2020	2019
Revenue	$ 1.4	$ 0.4
Loss from operations	$ (1.4)	$ (0.4)
Net loss per share, basic and diluted	$ (0.01)	$ (0.01)

Influence of COVID-19

Our test volumes began decreasing significantly in the second half of March 2020 as a result of COVID-19 and related limitations and priorities across the healthcare system. While it is too early to predict the full impact COVID-19 will have on our business, we expect it to have a material impact on our financial results for at least the next quarter and for the foreseeable future.

Approximately 8% of our workforce as of March 31, 2020 was impacted by a reduction in force in April 2020 in an initiative to manage costs and cash burn that resulted in one-time costs in the second quarter of 2020 of $3.8 million. In addition, effective May 2020, we have reduced the salaries of our named executive officers by approximately 20%.

On March 27, 2020, the Coronavirus Aid, Relief, and Economic Security Act ("CARES Act") was signed into law which was a stimulus bill intended to bolster the economy, among other things, and provide assistance to qualifying businesses and individuals. The CARES Act included an infusion of funds into the healthcare system, and in April 2020, we received $3.8 million as a part of this initiative. This payment will be recognized in our consolidated statement of operations in April 2020. At this time, we are not certain of the availability, extent or impact of any future relief provided under the CARES Act.

Accounts receivable

The majority of our accounts receivable represents amounts billed to institutions (e.g., hospitals, clinics, partners) and estimated amounts to be collected from third-party insurance payers for diagnostic test revenue recognized. Also included are amounts due under the terms of collaboration and genome network agreements for diagnostic testing and data aggregation reporting services provided and proprietary platform access rights transferred.

Deferred revenue

We record deferred revenue when cash payments are received or due in advance of our performance related to one or more performance obligations. The amounts deferred to date primarily consist of prepayments related to our consumer direct channel as well as consideration received pertaining to the estimated exercise of certain re-requisition rights. In order to comply with loss contract rules, our re-requisition rights revenue deferral is no less than the estimated cost of fulfilling related obligations. We recognize revenue related to re-requisition rights as the rights are exercised or expire unexercised, which is generally within 90 days of initial deferral.

4. Business combinations

Singular Bio

In June 2019, we acquired 100% of the fully diluted equity of Singular Bio Inc. ("Singular Bio"), a privately held company developing single molecule detection technology, for approximately $57.3 million, comprised of $53.9 million in the form of 2.5 million shares of our common stock and the remainder in cash.

Our purchase price allocation for the acquisition is preliminary and subject to revision as additional information about fair value of assets and liabilities becomes available, primarily related to our deferred tax liability assumed in connection with the acquisition as the short period tax return has not yet been filed. Additional information that existed as of the acquisition date but at the time was unknown to us may become known to us during the remainder of the measurement period, a period not to exceed 12 months from the acquisition date.

We granted approximately $90.0 million of RSUs under our 2015 Stock Incentive Plan as inducement awards to new employees who joined Invitae in connection with our acquisition of Singular Bio. $45.0 million of the RSUs are time-based and vest in three equal installments in December 2019, June 2020, and December 2020, subject to the employee's continued service with us ("Time-based RSUs") and $45.0 million of the RSUs are performance-based RSUs ("PRSUs") that vest upon the achievement of certain performance conditions over a period of approximately 12 months from the date of acquisition, subject to the employee's continued service with us. Since the number of awards granted is based on a 30-day volume weighted-average share price with a fixed dollar value, these Time-based RSUs and PRSUs are liability-classified and the fair value will be estimated at each reporting period based on the number of shares that are expected to be issued at each reporting date and our closing stock price, which combined are categorized as Level 3 inputs. Therefore, fair value of the RSUs and PRSUs and the number of shares to be issued will not be fixed until the awards vest.

During the three months ended March 31, 2020, we recorded research and development stock-based compensation expense of $7.6 million related to the Time-based RSUs and $11.2 million related to the PRSUs based on our evaluations of the probability of achieving performance conditions. As of March 31, 2020, the Time-based RSUs and PRSUs had a total fair value of $43.1 million and $44.4 million, respectively, based on a total estimated issuance of 6.2 million shares and expectation of the achievement of the performance conditions. As of March 31, 2020, 0.8 million of the Time-based RSUs had vested and none of these PRSUs had vested.

Jungla

In July 2019, we acquired 100% of the equity interest of Jungla Inc. ("Jungla"), a privately held company developing a platform for molecular evidence testing in genes, for approximately $59.0 million, comprised of $44.9 million in the form of shares of our common stock and the remainder in cash. We agreed to pay a portion of the cash and issue approximately 0.2 million shares of our common stock after a 12-month period, subject to a hold back to satisfy indemnification obligations that may arise.

We may be required to pay contingent consideration based on achievement of post-closing development milestones. As of the acquisition date, the fair value of this contingent consideration was $10.7 million including cash and common stock. The milestones are expected to be completed within two years. The material factors that may impact the fair value of the contingent consideration, and therefore, this liability, are the probabilities and timing of achieving the related milestones and the discount rate we used to estimate the fair value. Significant changes in any of the probabilities of success would result in a significant change in the fair value, which will be estimated at each reporting date with changes reflected as a general and administrative expense.

Our purchase price allocation for the acquisition is preliminary and subject to revision as additional information about fair value of assets and liabilities becomes available, primarily related to our deferred tax liability assumed in connection with the acquisition as the short period tax return has not yet been filed. Additional information that existed as of the acquisition date but at the time was unknown to us may become known to us during the remainder of the measurement period, a period not to exceed 12 months from the acquisition date.

As of March 31, 2020, we had a stock payable liability of $2.7 million which represents the hold-back obligation to issue 0.2 million shares subject to indemnification claims that may arise in connection with our acquisition of Jungla. This liability is adjusted at each reporting period based on the fair value of our common stock, which is a Level 3 input, with the change recorded in other income, net.

Clear Genetics

In November 2019, we acquired 100% of the equity interest of Clear Genetics Inc. ("Clear Genetics"), a developer of software for providing genetic services at scale, for approximately $50.1 million. Of the cash and stock purchase price consideration issued, $0.2 million of cash and approximately 0.4 million shares of our common stock are subject to a 12-month hold back to satisfy indemnification obligations that may arise.

Our purchase price allocation for the acquisition is preliminary and subject to revision as additional information about fair value of assets and liabilities becomes available, primarily related to our deferred tax liability assumed in connection with the acquisition as the short period tax return has not yet been filed. Additional information that existed as of the acquisition date but at the time was unknown to us may become known to us during the remainder of the measurement period, a period not to exceed 12 months from the acquisition date.

As of March 31, 2020, we had a stock payable liability of $5.7 million which represents the hold-back obligation to issue 0.4 million shares subject to indemnification claims that may arise in connection with our acquisition of Clear Genetics. This liability is adjusted at each reporting period based on the fair value of our common stock, which is a Level 3 input, with the change recorded in other income, net.

Diploid

In March 2020, we acquired 100% of the equity interest of Diploid, a developer of artificial intelligence software capable of diagnosing genetic disorders using sequencing data and patient information, for approximately $82.3 million in cash and shares of our common stock. Of the stock purchase price consideration issued, approximately 0.4 million shares are subject to a hold-back to satisfy indemnification obligations that may arise. We included the financial results of Diploid in our consolidated financial statements from the acquisition date, which were not material for the three months ended March 31, 2020.

The following table summarizes the purchase price recorded as a part of the acquisition of Diploid (in thousands):

	Purchase Price
Cash transferred	$ 32,323
Hold-back consideration - common stock	7,538
Common stock transferred	42,453
Total	$ 82,314

Assets acquired and liabilities assumed are recorded based on valuations derived from estimated fair value assessments and assumptions used by us. While we believe that our estimates and assumptions underlying the valuations are reasonable, different estimates and assumptions could result in different valuations assigned to the individual assets acquired and liabilities assumed, and the resulting amount of goodwill. The following table summarizes the fair values of assets acquired and liabilities assumed through our acquisition of Diploid at the date of acquisition (in thousands):

Cash	$ 124
Accounts receivable	26
Developed technology	41,789
Total identifiable assets acquired	41,939
Accounts payable	(30)
Deferred tax liability	(10,250)
Net identifiable assets acquired	31,659
Goodwill	50,655
Total purchase price	$ 82,314

Based on the guidance provided in ASC 805, *Business Combinations*, we accounted for the acquisition of Diploid as a business combination in which we determined that 1) Diploid was a business which combines inputs and processes to create outputs, and 2) substantially all of the fair value of gross assets acquired was not concentrated in a single identifiable asset or group of similar identifiable assets.

Our purchase price allocation for the acquisition is preliminary and subject to revision as additional information about fair value of assets and liabilities becomes available, primarily related to our deferred tax liability assumed in connection with the acquisition. Additional information that existed as of the acquisition date but at the time was unknown to us may become known to us during the remainder of the measurement period, a period not to exceed 12 months from the acquisition date.

We measured the identifiable assets and liabilities assumed at their acquisition date fair values separately from goodwill. The intangible asset acquired is developed technology related to Diploid's artificial intelligence technology platform. The fair value of the developed technology was estimated using an income approach with an estimated useful life of nine years. As of the acquisition date, we recorded a stock payable liability of $7.5 million to represent the hold-back obligation to issue 0.4 million shares subject to indemnification claims that may arise. This liability is adjusted at each reporting period based on the fair value of our common stock, which is a Level 3 input. As of March 31, 2020, the value of this liability was $5.8 million with the change recorded in other income, net.

Goodwill represents the excess of the purchase price over the fair value of the net tangible and intangible assets acquired. The acquisition of Diploid resulted in the recognition of $50.7 million of goodwill which we believe relates primarily to expansion of the acquired technology to apply to new areas of genetic testing. Goodwill created as a result of the acquisition of Diploid is not deductible for tax purposes.

As part of our acquisition of Diploid, we intend to grant approximately $5.0 million of RSUs under our 2015 Stock Incentive Plan as inducement awards to new employees who joined Invitae in connection with the acquisition. As of March 31, 2020, the terms of these awards were still being finalized and therefore had not been granted.

5. Goodwill and intangible assets

Goodwill

The changes in the carrying amounts of goodwill were as follows (in thousands):

Balance as of December 31, 2019	$ 126,777
Goodwill acquired - Diploid	50,655
Balance as of March 31, 2020	$ 177,432

Intangible assets

The following table presents details of our intangible assets (in thousands):

	March 31, 2020				December 31, 2019			
	Cost	Accumulated Amortization	Net	Weighted-Average Useful Life (in Years)	Cost	Accumulated Amortization	Net	Weighted-Average Useful Life (in Years)
Customer relationships	$ 23,763	$ (5,841)	$ 17,922	10.0	$ 23,763	$ (5,141)	$ 18,622	10.0
Developed technology	126,185	(11,291)	114,894	8.7	84,396	(8,476)	75,920	8.6
Non-compete agreement	286	(186)	100	5.0	286	(172)	114	5.0
Trade name	576	(519)	57	2.7	576	(480)	96	2.7
Patent licensing agreement	496	(79)	417	15.0	496	(70)	426	15.0
Favorable leases	247	(247)	—	2.2	247	(238)	9	2.2
In-process research and development	29,988	—	29,988	n/a	29,988	—	29,988	n/a
	$ 181,541	$ (18,163)	$ 163,378	8.9	$ 139,752	$ (14,577)	$ 125,175	8.9

Acquisition-related intangibles included in the above table are finite-lived, other than in-process research and development which has an indefinite life, and are carried at cost less accumulated amortization. Customer relationships are being amortized on an accelerated basis, in proportion to estimated cash flows. All other finite-lived acquisition-related intangibles are being amortized on a straight-line basis over their estimated lives, which approximates the pattern in which the economic benefits of the intangible assets are realized. Amortization expense was $3.6 million and $1.3 million for the three months ended March 31, 2020 and 2019, respectively. Amortization expense is recorded to cost of revenue, research and development, sales and marketing and general and administrative expense.

The following table summarizes our estimated future amortization expense of intangible assets with finite lives as of March 31, 2020 (in thousands):

2020 (remainder of year)	$ 13,568
2021	18,426
2022	16,721
2023	15,708
2024	15,430
Thereafter	53,537
Total estimated future amortization expense	$ 133,390

6. Balance sheet components

Property and equipment, net

Property and equipment consisted of the following (in thousands):

	March 31, 2020	December 31, 2019
Leasehold improvements	$ 21,422	$ 18,352
Laboratory equipment	26,983	24,873
Computer equipment	6,476	5,995
Software	2,611	2,611
Furniture and fixtures	1,277	1,198
Automobiles	58	58
Construction-in-progress	10,239	10,795
Total property and equipment, gross	69,066	63,882
Accumulated depreciation and amortization	(27,981)	(26,135)
Total property and equipment, net	$ 41,085	$ 37,747

Depreciation expense was $2.0 million and $1.6 million for the three months ended March 31, 2020 and 2019, respectively.

Accrued liabilities

Accrued liabilities consisted of the following (in thousands):

	March 31, 2020	December 31, 2019
Accrued compensation and related expenses	$ 18,927	$ 16,440
Compensation and other liabilities associated with business combinations	55,789	30,560
Deferred revenue	1,460	1,429
Other	12,617	16,385
Total accrued liabilities	$ 88,793	$ 64,814

7. Fair value measurements

Financial assets and liabilities are recorded at fair value. Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability (an exit price) in an orderly transaction between market participants at the reporting date. The authoritative guidance establishes a three-level valuation hierarchy that prioritizes the inputs to valuation techniques used to measure fair value based upon whether such inputs are observable or unobservable. Observable inputs reflect market data obtained from independent sources, while unobservable inputs reflect market assumptions made by the reporting entity.

The three-level hierarchy for the inputs to valuation techniques is summarized as follows:

Level 1—Observable inputs such as quoted prices (unadjusted) for identical instruments in active markets.

Level 2—Observable inputs such as quoted prices for similar instruments in active markets, quoted prices for identical or similar instruments in markets that are not active, or model-derived valuations whose significant inputs are observable.

Level 3—Unobservable inputs that reflect the reporting entity’s own assumptions.

The following tables set forth the fair value of our consolidated financial instruments that were measured at fair value on a recurring basis (in thousands):

	March 31, 2020						
	Amortized Cost	Unrealized Gains	Unrealized Losses	Estimated Fair Value	Level 1	Level 2	Level 3
Financial assets:							
Money market funds	$ 32,653	$ —	$ —	$ 32,653	$ 32,653	$ —	$ —
Certificates of deposit	300	—	—	300	—	300	—
U.S. treasury notes	137,937	1,157	—	139,094	139,094	—	—
U.S. government agency securities	64,857	137	—	64,994	—	64,994	—
Total financial assets	$ 235,747	$ 1,294	$ —	$ 237,041	$ 171,747	$ 65,294	$ —
Financial liabilities:							
Stock payable liability				$ 14,362	$ —	$ —	$ 14,362
Contingent consideration				11,200	—	—	11,200
Total financial liabilities				$ 25,562	$ —	$ —	$ 25,562

	March 31, 2020
Reported as:	
Cash equivalents	$ 26,310
Restricted cash	6,343
Marketable securities	204,388
Total cash equivalents, restricted cash, and marketable securities	$ 237,041
Accrued liabilities	$ 8,500
Other long-term liabilities	$ 17,062

	December 31, 2019						
	Amortized Cost	Unrealized Gains	Unrealized Losses	Estimated Fair Value	Level 1	Level 2	Level 3
Financial assets:							
Money market funds	$ 39,396	$ —	$ —	$ 39,396	$ 39,396	$ —	$ —
Certificates of deposit	300	—	—	300	—	300	—
U.S. treasury notes	150,627	—	(15)	150,612	150,612	—	—
U.S. government agency securities	193,302	6	—	193,308	—	193,308	—
Total financial assets	$ 383,625	$ 6	$ (15)	$ 383,616	$ 190,008	$ 193,608	$ —
Financial liabilities:							
Contingent consideration				$ 11,300	—	—	$ 11,300
Total financial liabilities				$ 11,300	—	—	$ 11,300

	December 31, 2019
Reported as:	
Cash equivalents	$ 136,997
Restricted cash	6,183
Marketable securities	240,436
Total cash equivalents, restricted cash, and marketable securities	$ 383,616
Accrued liabilities	$ 3,300
Other long-term liabilities	$ 8,000

There were no transfers between Level 1, Level 2 and Level 3 during the periods presented. The total fair value of investments with unrealized losses at March 31, 2020 was nil. None of the available-for-sale securities held as of March 31, 2020 has been in a continuous unrealized loss position for more than one year. Interest income generated from our investments was $1.0 million and $0.6 million during the three months ended March 31, 2020 and 2019, respectively.

Our certificates of deposit and debt securities of U.S. government agency entities are classified as Level 2 as they are valued based upon quoted market prices for similar instruments in active markets, quoted prices for identical or similar instruments in markets that are not active and model-based valuation techniques for which all significant inputs are observable in the market or can be corroborated by observable market data for substantially the full term of the assets. Where applicable, these models project future cash flows and discount the future amounts to a present value using market-based observable inputs obtained from various third-party data providers, including but not limited to benchmark yields, interest rate curves, reported trades, broker/dealer quotes and reference data.

Stock payable liabilities relate to certain indemnification hold-backs resulting from business combinations that are settled in shares of our common stock. We elected to account for these liabilities using the fair value option due to the inherent nature of the liabilities and the changes in value of the underlying shares that will ultimately be issued to settle the liabilities. The estimated fair value of these liabilities is classified as Level 3 and determined based upon the number of shares that are issuable to the sellers and the quoted closing price of our common stock as of the reporting date. The number of shares that will ultimately be issued is subject to adjustment for indemnified claims that existed as of the closing date for each acquisition. Changes in the number of shares issued and share price can significantly affect the estimated fair value of the liabilities. During the three months ended March 31, 2020, the change in fair value related to stock payable liabilities recorded to other income, net was $3.4 million.

As of March 31, 2020, we had contingent obligations of $11.2 million of our common stock to the former owners of Jungla in conjunction with our acquisition of Jungla in July 2019. The amount of the contingent obligation is dependent upon achievement of certain post-close development milestones. We estimated the fair value of the contingent consideration as $10.7 million at the acquisition date in July 2019 using a discounted cash flow technique based on estimated achievement of the post-close milestones and discount rates which were Level 3 inputs not supported by market activity. These inputs can significantly affect the estimated fair value of the

contingent consideration. The value of the liability is subsequently remeasured to fair value at each reporting date with changes recorded as general and administrative expense.

8. Commitments and contingencies

Leases

Operating leases

In 2015, we entered into a lease agreement for our headquarters and main production facility in San Francisco, California which commenced in 2016. This lease expires in 2026 and we may renew the lease for an additional ten years. This optional period was not considered reasonably certain to be exercised and therefore we determined the lease term to be a ten-year period expiring in 2026. In connection with the execution of the lease, we provided a security deposit of approximately $4.6 million which is included in restricted cash in our consolidated balance sheets. We also have other operating leases for office and laboratory space in California, Massachusetts and New York. We expect to enter into new leases and modifying existing leases as we support continued growth of our operations.

As of March 31, 2020, the weighted-average remaining lease term for our operating leases was 6.3 years and the weighted-average discount rate used to determine our operating lease liability was 11.6%. Cash payments included in the measurement of our operating lease liabilities were $2.7 million for the three months ended March 31, 2020.

The components of lease costs, which were included in cost of revenue, research and development, selling and marketing and general and administrative expenses on our consolidated statements of operations were as follows (in thousands):

	Three Months Ended March 31,	
	2020	2019
Operating lease costs	$ 2,615	$ 2,517
Sublease income	—	(43)
Total operating lease costs	2,615	2,474
Finance lease costs	484	420
Total lease costs	$ 3,099	$ 2,894

Future minimum payments under non-cancelable operating leases as of March 31, 2020 are as follows (in thousands):

2020 (remainder of year)	$ 7,770
2021	10,671
2022	10,631
2023	10,424
2024	10,560
Thereafter	18,459
Future non-cancelable minimum operating lease payments	68,515
Less: imputed interest	(20,623)
Total operating lease liabilities	47,892
Less: current portion	(5,125)
Operating lease obligations, net of current portion	$ 42,767

Finance leases

We have entered into various finance lease agreements to obtain laboratory equipment. The terms of our finance leases are generally three years with a weighted-average remaining lease term of 2.0 years as of March 31, 2020 and are typically secured by the underlying equipment. The weighted-average discount rate used to determine our finance lease liability was 5.7%. The portion of the future payments designated as principal repayment was classified as a finance lease obligation on our consolidated balance sheets. Finance lease assets are recorded within other assets on our consolidated balance sheet and were $5.1 million and $5.6 million as of March 31, 2020

and December 31, 2019, respectively. Cash payments included in the measurement of our finance lease liabilities were $0.7 million and $0.5 million for the three months ended March 31, 2020 and 2019, respectively.

Future payments under finance leases at March 31, 2020 are as follows (in thousands):

2020 (remainder of year)	$	1,306
2021		611
2022		611
Total finance lease obligations		2,528
Less: interest		(139)
Present value of net minimum finance lease payments		2,389
Less: current portion		(1,370)
Finance lease obligations, net of current portion	$	1,019

Debt financing

In November 2018, we entered into a Note Purchase Agreement (the "2018 Note Purchase Agreement") pursuant to which we were eligible to borrow an aggregate principal amount up to $200.0 million over a seven year maturity term which included an initial borrowing of $75.0 million in November 2018. We received net proceeds of $10.3 million after terminating and repaying the balance of our obligations of approximately $64.7 million with our previous lender.

In September 2019, we settled our obligations under the 2018 Note Purchase Agreement in full for $85.7 million, which included repayment of principal of $75.0 million, accrued interest of $2.4 million, and prepayment fees of $8.9 million which were recorded as debt extinguishment costs in other income (expense), net in our statement of operations during the three months ended September 30, 2019.

Interest expense related to our debt financings, excluding the impact of our Convertible Senior Notes, was nil and $2.0 million for the three months ended March 31, 2020 and 2019, respectively.

Convertible Senior Notes

In September 2019, we issued, at par value, $350.0 million aggregate principal amount of 2.00% Convertible Senior Notes due 2024 in a private offering. The Convertible Senior Notes are our senior unsecured obligations and will mature on September 1, 2024, unless earlier converted, redeemed or repurchased. The Convertible Senior Notes bear cash interest at a rate of 2.0% per year, payable semi-annually in arrears on March 1 and September 1 of each year, beginning on March 1, 2020.

Upon conversion, the Convertible Senior Notes will be convertible into cash, shares of our common stock or a combination of cash and shares of our common stock, at our election. Our current intent is to settle the principal amount of the Convertible Senior Notes in cash upon conversion, with any remaining conversion value being delivered in shares of our common stock. The initial conversion rate for the Convertible Senior Notes is 33.6293 shares of our common stock per $1,000 principal amount of the Convertible Senior Notes (equivalent to an initial conversion price of approximately $29.74 per share of common stock).

If we undergo a fundamental change (as defined in the indenture governing the Convertible Senior Notes), the holders of the Convertible Senior Notes may require us to repurchase all or any portion of their Convertible Senior Notes for cash at a repurchase price equal to 100% of the principal amount of the Convertible Senior Notes to be repurchased plus accrued and unpaid interest to, but excluding, the redemption date.

The Convertible Senior Notes will be convertible at the option of the holders at any time prior to the close of business on the business day immediately preceding March 1, 2024, only under the following circumstances: (1) during any calendar quarter commencing after the calendar quarter ending on December 31, 2019 (and only during such calendar quarter), if the last reported sale price of our common stock for at least 20 trading days (whether or not consecutive) during a period of 30 consecutive trading days ending on, and including, the last trading day of the immediately preceding calendar quarter is greater than or equal to 130% of the conversion price for the Convertible Senior Notes on each applicable trading day; (2) during the five business day period after any five consecutive trading day period (the “measurement period”) in which the trading price per $1,000 principal amount of Convertible Senior Notes for each trading day of the measurement period was less than 98% of the product of the last reported sale price of our common stock and the conversion rate on each such trading day; (3) if we call any or all of the Convertible Senior Notes for redemption, at any time prior to the close of business on the scheduled trading day immediately preceding the redemption date; or (4) upon the occurrence of specified corporate events. On or after

March 1, 2024 until the close of business on the business day immediately preceding the maturity date, holders may convert their Convertible Senior Notes at any time, regardless of the foregoing circumstances. As of March 31, 2020, none of the above circumstances had occurred and therefore the Convertible Senior Notes could not have been converted.

We may not redeem the Convertible Senior Notes prior to September 6, 2022. We may redeem for cash all or any portion of the Convertible Senior Notes, at our option, on or after September 6, 2022 and on or before the 30th scheduled trading day immediately before the maturity date if the last reported sale price of the Common Stock has been at least 130% of the conversion price then in effect for at least 20 trading days (whether or not consecutive) during any 30 consecutive trading day period (including the last trading day of such period) ending on, and including, the trading day immediately preceding the date on which we provide notice of redemption at a redemption price equal to 100% of the principal amount of the notes to be redeemed, plus accrued and unpaid interest to, but excluding, the redemption date.

The Convertible Senior Notes as of March 31, 2020 consisted of the following (in thousands):

Outstanding principal	$	350,000
Unamortized debt discount and issuance costs		(77,613)
Net carrying amount, liability component	$	272,387

As of March 31, 2020, the fair value of the Convertible Senior Notes was $310.8 million. The estimated fair value of the Convertible Senior Notes, which are classified as Level 2 financial instruments, was determined based on the estimated or actual bid prices of the Convertible Senior Notes in an over-the-counter market. We recognized $5.4 million of interest expense related to the Convertible Senior Notes during the three months ended March 31, 2020.

Other commitments

In the normal course of business, we enter into various purchase commitments primarily related to service agreements and laboratory supplies. At March 31, 2020, our total future payments under noncancelable unconditional purchase commitments having a remaining term of over one year were $9.2 million.

Guarantees and indemnifications

As permitted under Delaware law and in accordance with our bylaws, we indemnify our directors and officers for certain events or occurrences while the officer or director is or was serving in such capacity. The maximum amount of potential future indemnification is unlimited; however, we maintain director and officer liability insurance. This insurance allows the transfer of the risk associated with our exposure and may enable us to recover a portion of any future amounts paid. We believe the fair value of these indemnification agreements is minimal. Accordingly, we did not record any liabilities associated with these indemnification agreements at March 31, 2020 or December 31, 2019.

Contingencies

We were not a party to any material legal proceedings at March 31, 2020, or at the date of this report. We are and may from time to time become involved in various legal proceedings and claims arising in the ordinary course of business. While we believe any such claims are unsubstantiated, and we believe we are in compliance with applicable laws and regulations applicable to our business, the resolution of any such claims could be material.

9. Stockholders' equity

Shares outstanding

Shares of convertible preferred and common stock were as follows (in thousands):

	Three Months Ended March 31,	
	2020	2019
Convertible preferred stock:		
Shares outstanding, beginning of period	125	3,459
Conversion into common stock	—	(3,334)
Shares outstanding, end of period	125	125
Common stock:		
Shares outstanding, beginning of period	98,796	75,481
Common stock issued in connection with public offering	—	10,350
Common stock issued on exercise of stock options, net	178	260
Common stock issued pursuant to vesting of RSUs	426	121
Common stock issued pursuant to exercises of warrants	142	15
Common stock issued pursuant to business combinations	2,378	40
Common stock issued upon conversion of preferred stock	—	3,334
Shares outstanding, end of period	101,920	89,601

10. Stock incentive plans

Stock incentive plans

In 2010, we adopted the 2010 Incentive Plan (the "2010 Plan"). The 2010 Plan provides for the granting of stock-based awards to employees, directors and consultants under terms and provisions established by our Board of Directors. Under the terms of the 2010 Plan, options may be granted at an exercise price not less than the fair market value of our common stock. For employees holding more than 10% of the voting rights of all classes of stock, the exercise prices for incentive and nonstatutory stock options must be at least 110% of fair market of our common stock on the grant date, as determined by our Board of Directors. The terms of options granted under the 2010 Plan may not exceed ten years.

In January 2015, we adopted the 2015 Stock Incentive Plan (the "2015 Plan"), which became effective upon the closing of our initial public offering ("IPO"). Shares outstanding under the 2010 Plan were transferred to the 2015 Plan upon effectiveness of the 2015 Plan. The 2015 Plan provides for automatic annual increases in shares available for grant, beginning on January 1, 2016 through January 1, 2025. In addition, shares subject to awards under the 2010 Plan that are forfeited or terminated will be added to the 2015 Plan. The 2015 Plan provides for the grant of incentive stock options, nonstatutory stock options, restricted stock awards, stock units, stock appreciation rights and other forms of equity compensation, all of which may be granted to employees, including officers, non-employee directors and consultants. Additionally, the 2015 Plan provides for the grant of cash-based awards. In June 2019, we amended and restated the 2015 Plan to create a pool of shares to be awarded solely as a material inducement to employees.

Options granted generally vest over a period of four years. Typically, the vesting schedule for options granted to newly hired employees provides that 1/4 of the award vests upon the first anniversary of the employee's date of hire, with the remainder of the award vesting monthly thereafter at a rate of 1/48 of the total shares subject to the option. All other options typically vest in equal monthly installments over the four-year vesting schedule.

RSUs generally vest over a period of three years. Typically, the vesting schedule for RSUs provides that 1/3 of the award vests upon each anniversary of the grant date, with certain awards that include a portion that vests immediately upon grant. In June 2019, we granted Time-based RSUs in connection with the acquisition of Singular Bio which vest in three equal installments over a period of 18 months and PRSUs that vest based on the achievement of performance conditions; see further details in Note 4, "Business combinations."

Under our management incentive compensation plan, in July 2019 we granted PRSUs to our executive officers as well as other specified senior level employees based on the level of achievement of a specified 2019

revenue goal. One-third of the 0.8 million shares that were ultimately awarded under this plan vested during the three months ended March 31, 2020 and the remaining awards will continue to vest over a period of two years.

Activity under the 2010 Plan and the 2015 Plan is set forth below (in thousands, except per share amounts and years):

	Shares Available For Grant	Stock Options Outstanding	Weighted-Average Exercise Price Per Share	Weighted-Average Remaining Contractual Life (Years)	Aggregate Intrinsic Value
Balances at December 31, 2019	5,444	3,542	$ 9.49	6.1	$ 24,966
Additional shares reserved	4,552	—			
Options exercised	—	(178)	6.44		
RSUs and PRSUs granted[1]	(1,223)	—			
RSUs and PRSUs cancelled	232	—			
Balances at March 31, 2020	9,005	3,364	$ 9.66	5.9	$ 15,430
Options exercisable at March 31, 2020		2,954	$ 8.98	5.6	$ 14,187
Options vested and expected to vest at March 31, 2020		3,311	$ 9.56	5.9	$ 15,290

(1) Includes the changes in the Time-based RSUs and PRSUs granted as a part of the Singular Bio acquisition in June 2019 which are based on a fixed dollar value. The number of shares issued will be variable until the awards vest. See further details in Note 4, "Business combinations."

The aggregate intrinsic value is calculated as the difference between the exercise price of the underlying stock options and the fair value of our common stock for stock options that were in-the-money.

The total grant-date fair value of options to purchase common stock vested was $0.7 million and $1.1 million in the three months ended March 31, 2020 and 2019, respectively. The intrinsic value of options to purchase common stock exercised was $2.3 million and $3.3 million in the three months ended March 31, 2020 and 2019, respectively.

The following table summarizes RSU activity, which includes the changes in Time-based RSUs and PRSUs granted in connection with our acquisition of Singular Bio (in thousands, except per share data):

	Number of Shares	Weighted- Average Grant Date Fair Value Per Share
Balance at December 31, 2019	8,885	$ 15.17
RSUs granted	218	$ 17.89
Time-based RSUs and PRSUs granted - Singular Bio [1]	1,005	$ 13.67
RSUs vested	(426)	$ 18.00
RSUs cancelled	(232)	$ 20.27
Balance at March 31, 2020	9,450	$ 14.82

(1) Includes the changes in the Time-based RSUs and PRSUs granted as a part of the Singular Bio acquisition in June 2019 which are based on a fixed dollar value. The number of shares issued will be variable until the awards vest. The weighted-average grant date fair value per share reflects the fair value pricing of the full award. See further details in Note 4, "Business combinations."

2015 Employee Stock Purchase Plan

In January 2015, we adopted the 2015 Employee Stock Purchase Plan (the “ESPP”), which became effective upon the closing of the IPO. Employees participating in the ESPP may purchase common stock at 85% of the lesser of the fair market value of common stock on the purchase date or last trading day preceding the offering date. At March 31, 2020, cash received from payroll deductions pursuant to the ESPP was $3.4 million. At March 31, 2020, a total of 1.6 million shares of common stock were reserved for issuance under the ESPP.

Stock-based compensation

The following table summarizes stock-based compensation expense included in the consolidated statements of operations (in thousands):

	Three Months Ended March 31,	
	2020	2019
Cost of revenue	$ 861	$ 651
Research and development	22,204	1,805
Selling and marketing	1,823	1,243
General and administrative	4,390	1,524
Total stock-based compensation expense	$ 29,278	$ 5,223

11. Net loss per share

The following table presents the calculation of basic and diluted net loss per share (in thousands, except per share amounts):

	Three Months Ended March 31,	
	2020	2019
Net loss	$ (98,527)	$ (37,677)
Shares used in computing net loss per share, basic and diluted	99,632	79,369
Net loss per share, basic and diluted	$ (0.99)	$ (0.47)

The following common stock equivalents have been excluded from diluted net loss per share because their inclusion would be anti-dilutive (in thousands):

	Three Months Ended March 31,	
	2020	2019
Shares of common stock subject to outstanding options	3,478	3,759
Shares of common stock subject to outstanding warrants	489	609
Shares of common stock subject to outstanding RSUs	5,703	4,130
Shares of common stock subject to outstanding PRSUs	3,988	—
Shares of common stock pursuant to ESPP	368	213
Shares of common stock underlying Series A convertible preferred stock	125	2,465
Shares of common stock subject to convertible senior notes exercise	11,770	—
Total shares of common stock equivalents	25,921	11,176

12. Geographic information

Revenue by country is determined based on the billing address of the customer. The following presents revenue by country (in thousands):

	Three Months Ended March 31,	
	2020	2019
United States	$ 59,806	$ 37,645
Canada	1,219	965
Rest of world	3,223	1,943
Total revenue	$ 64,248	$ 40,553

13. Subsequent events

YouScript and Genelex

In March 2020, we entered into definitive agreements for 100% of the capital stock of YouScript, a privately held clinical decision support analytics platform, and Genelex, a privately held pharmacogenetic testing company. These transactions were subject to certain closing conditions which were satisfied in April 2020 at which point the transactions were consummated. At the closing of the transaction with YouScript, we issued an aggregate of 1.8 million shares of our common stock and approximately $23.6 million in cash to former securityholders of YouScript. Up to approximately $1.4 million in cash and 0.5 million additional shares of our common stock are subject to a hold-back to satisfy indemnification obligations that may arise following the closing of our acquisition of YouScript. At the closing of the transaction with Genelex, we issued an aggregate of 0.8 million shares and to former securityholders of Genelex. Up to 0.1 million of additional shares are subject to a hold back to satisfy indemnification obligations that may arise following the closing of our acquisition of Genelex. We would also become obligated pursuant to the terms of the Genelex acquisition agreement to issue additional shares of common stock to the former securityholders of Genelex if, within a specified period following the closing, Genelex achieves a certain product milestone, in which case we would thereafter issue to the former securityholders of Genelex shares of our common stock with a value equal to a portion of the gross revenues actually received by us for that product and similar products during an earn-out period of up to four years. Given the timing of the closing of these transactions, we are currently in the process of valuing the assets acquired and liabilities assumed. As a result, we are not yet able to provide the amounts to be recognized as of the acquisition dates for the major classes of assets acquired and liabilities assumed and other related disclosures. We expect to disclose this and other related information in our Form 10-Q for the quarter ending June 30, 2020.

Public offering

In April 2020, we issued, in an underwritten public offering, an aggregate of 20.4 million shares of our common stock at a price of $9.00 per share, for gross proceeds of $184.0 million and net proceeds of approximately $173.0 million after deducting underwriting discounts and commissions and offering expenses.

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

The following discussion of our financial condition and results of operations should be read in conjunction with our condensed consolidated financial statements and the related notes included in Item 1 of Part I of this report, and together with our audited consolidated financial statements and the related notes included in our Annual Report on Form 10-K for the year ended December 31, 2019. Historic results are not necessarily indicative of future results.

This report contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. All statements in this report other than statements of historical fact, including statements identified by words such as "believe," "may," "will," "estimate," "continue," "anticipate," "intend," "expect" and similar expressions, are forward-looking statements. Forward-looking statements include, but are not limited to, statements about:

- our views regarding the future of genetic testing and its role in mainstream medical practice;
- the impact of COVID-19 on our business and the actions we may take in response thereto;
- our mission and strategy for our business, products and technology, including our ability to expand our content and develop new content while maintaining attractive pricing, further enhance our genetic testing service and the related user experience, build interest in and demand for our tests and attract potential partners;
- the implementation of our business model;
- the expected benefits from and our ability to integrate our acquisitions;
- the rate and degree of market acceptance of our tests and genetic testing generally;
- our ability to scale our infrastructure and operations in a cost-effective manner;
- the timing of and our ability to introduce improvements to our genetic testing platform and to expand our assays to include additional genes;
- our expectations with respect to future hiring;
- the timing and results of studies with respect to our tests;
- developments and projections relating to our competitors and our industry;
- our competitive strengths;
- the degree to which individuals will share genetic information generally, as well as share any related potential economic opportunities with us;
- our commercial plans, including our sales and marketing expectations;
- our ability to obtain and maintain adequate reimbursement for our tests;
- regulatory developments in the United States and foreign countries;
- our ability to attract and retain key scientific or management personnel;
- our expectations regarding our ability to obtain and maintain intellectual property protection and not infringe on the rights of others;
- our ability to obtain funding for our operations and the growth of our business, including potential acquisitions;
- our financial performance;
- the impact of accounting pronouncements and our critical accounting policies, judgments, estimates and assumptions on our financial results;
- our expectations regarding our future revenue, cost of revenue, operating expenses and capital expenditures, and our future capital requirements; and
- the impact of tax laws on our business.

Forward-looking statements are subject to a number of risks and uncertainties that could cause actual results to differ materially from those expected. These risks and uncertainties include, but are not limited to, those risks discussed in Item 1A of Part II of this report. Although we believe that the expectations and assumptions reflected in the forward-looking statements are reasonable, we cannot guarantee future results, level of activity, performance or achievements. In addition, neither we nor any other person assumes responsibility for the accuracy and completeness of any of these forward-looking statements. Any forward-looking statements in this report speak only as of the date of this report. We expressly disclaim any obligation or undertaking to update any forward-looking statements.

This report contains statistical data and estimates that we obtained from industry publications and reports. These publications typically indicate that they have obtained their information from sources they believe to be reliable, but do not guarantee the accuracy and completeness of their information. Some data contained in this report is also based on our internal estimates. Although we have not independently verified the third-party data, we believe it to be reasonable.

In this report, all references to "Invitae," "we," "us," "our," or "the Company" mean Invitae Corporation.

Invitae and the Invitae logo are trademarks of Invitae Corporation. We also refer to trademarks of other companies and organizations in this report.

Mission and strategy

Our mission is to bring comprehensive genetic information into mainstream medical practice, improving the quality of healthcare for billions of people. Our business model is to aggregate the world's genetic tests into a single platform, consolidate and grow the genetic testing market, and on that foundation, build a new industry in which a network of customers and partners can work together to continue improving healthcare for every individual in the modernized healthcare system around the world.

Our strategy for long-term growth centers on five key drivers of our business, which we believe work in conjunction to create a flywheel effect extending our leadership position in the new market we are building:

- **Expanding our content offering.** We intend to continue steadily adding additional content to the Invitae platform, ultimately leading to affordable access to the personal molecular information relevant in enabling personalized medicine. The breadth and depth of our offering is a core and central contribution to an improved user experience.
- **Creating a unique user experience.** A state-of-the-art interactive platform will enhance our service offering, leverage the uniquely empowering characteristics of online sharing of genetic information and, we believe, enable a superior economic offering to clients. We intend to continue to expend substantial efforts developing, acquiring and implementing technology-driven improvements to our customers' experience. We believe that an enhanced user experience and the resulting benefits to our brand and reputation will help draw customers to us over and above our direct efforts to do so.
- **Driving volume.** We intend to increase our brand equity and visibility through excellent service and a variety of marketing and promotional techniques, including scientific publications and presentations, sales, marketing, public relations, social media and web technology vehicles. We believe that rapidly increasing the volume of customers using our platform helps us to attract partners.
- **Attracting partners.** As we add more customers to our platform, we believe our business becomes particularly attractive to potential partners that can help the patients in our network further benefit from their genetic information or that provide us access to new customers who may wish to join our network. We believe the cumulative effect of the increased volume brought by these strategic components will allow us to lower the cost of our service.

- **Lowering the costs and price of genetic information.** Our goal is to provide customers with a broad menu of genetic content at a reasonable price and rapid turn-around time in order to grow volume and further achieve economies of scale. As we do so and experience further cost savings, we expect that those cost savings will allow us to deliver still more comprehensive information at decreasing prices and further improve the customer experience, allowing us to experience cumulative benefits from all of the efforts outlined above.

We seek to differentiate our service in the market by establishing an exceptional customer experience. To that end, we believe that elevating the needs of the customer over those of our other stakeholders is essential to our success. Thus, in our decision-making processes, we will strive to prioritize, in order:

1) the needs of our customers;
2) motivating our employees to serve the needs of our customers; and
3) our long-term stockholder value.

We are certain that focusing on customers as our top priority rather than short-term financial goals is the best way to build and operate an organization for maximum long-term value creation.

Business overview

We offer high-quality, comprehensive, affordable genetic testing across multiple clinical areas, including hereditary cancer, cardiology, neurology, pediatrics, metabolic conditions and rare diseases. To augment our offering and realize our mission, we have acquired multiple assets including four businesses in 2017, which expanded our suite of genome management offerings and facilitated our entry into prenatal and perinatal genetic testing, and three businesses in 2019 to advance our Non-Invasive Prenatal Screen ("NIPS") offering at lower costs, further enhance our genetic variant interpretation and expand our ability to scale and deliver genetic information. In 2020, we acquired Orbicule BV operating under the name "Diploid" ("Diploid") to enable us to quickly diagnose genetic disorders using artificial intelligence, as well as Genelex Solutions, LLC ("Genelex") and YouScript Incorporated ("YouScript") to bring pharmacogenetic testing and integrated clinical decision support to Invitae.

We have experienced rapid growth. For the years ended December 31, 2019, 2018 and 2017, our revenue was $216.8 million, $147.7 million, and $68.2 million, respectively, and we incurred net losses of $242.0 million, $129.4 million and $123.4 million, respectively. For the three months ended March 31, 2020 and 2019, our revenue was $64.2 million and $40.6 million, respectively, and we incurred net losses of $98.5 million and $37.7 million, respectively. At March 31, 2020, our accumulated deficit was $857.2 million. To meet the demands of scaling our business, we increased our number of employees to approximately 1,500 at March 31, 2020 from approximately 900 on March 31, 2019. Our sales force grew to approximately 300 at March 31, 2020 from approximately 170 at March 31, 2019.

Sales of our tests have grown significantly. In 2019, 2018 and 2017, we generated approximately 469,000, 292,000, and 145,000 billable tests, respectively. In the three months ended March 31, 2020, we generated approximately 151,000 billable tests compared to approximately 87,000 billable tests in the same period in 2019. Approximately 39% of the billable tests we performed in the first three months of 2020 were billable to institutions and patients, and the remainder were billable to third-party payers. Many of the gene tests on our assays are tests for which insurers reimburse. However, when we do not have reimbursement policies or contracts with private insurers, our claims for reimbursement may be denied upon submission, and we must appeal the claims. The appeals process is time consuming and expensive, and may not result in payment. Even if we are successful in achieving reimbursement, we may be paid at lower rates than if we were under contract with the third-party payer. When there is not a contracted rate for reimbursement, there is typically a greater coinsurance or copayment requirement from the patient which may result in further delay in payment for these tests.

We expect to incur operating losses for the near-term future and may need to raise additional capital in order to fund our operations. If we are unable to achieve our revenue growth objectives and successfully manage our costs, we may not be able to achieve profitability.

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

Impact of COVID-19

Our test volumes began decreasing significantly in the second half of March 2020 as a result of COVID-19 and related limitations and priorities across the healthcare system. While it is too early to predict the full impact COVID-19 will have on our business, we expect it to have a material impact on our financial results for at least the next quarter and for the foreseeable future. In response to the pandemic we have implemented measures to protect the health of all of our employees during this time with additional measures in place to better protect our on-site lab production and support teams. Our production facilities currently remain fully operational. While we have not experienced significant disruption in our supply chain and we do not yet know the full impact COVID-19 will have on our supply chain, we have increased our inventory on hand to respond to potential future disruptions that may occur.

Many announced healthcare guidelines call for a shift of regular physician visits and healthcare delivery activities to remote/telehealth formats. This is particularly important for patients who, despite the fall-out from COVID-19, continue to be diagnosed with critical diseases, like cancer, and for women who are pregnant or are trying to conceive. We believe our investments in new access platforms and technologies will position us well to provide a range of testing to clinicians and patients using a “clinical care from afar” model. An example is our rollout in April 2020 of our Gia telehealth platform. Gia, developed by Clear Genetics which we acquired in 2019, expands access to remote interaction between patients and clinicians as well as direct ordering of genetic tests. Such access could help to counteract some of the adverse in-office impacts of COVID-19, allowing continuation of key testing categories in a safe environment.

Given the unknown duration and extent of COVID-19’s impact on our business, and the healthcare system in general, we are adapting our spending and investment levels to evolving market conditions, including efforts to focus operating expense on increasing gross profit, putting additional hiring on hold and reducing headcount in certain areas, otherwise managing cash burn, and focusing commercial execution on workflows that support remote ordering, online support and telehealth. Approximately 8% of our workforce as of March 31, 2020 was impacted by a reduction in force in April 2020 in an initiative to manage costs and cash burn, which resulted in one-time costs in the second quarter of 2020 of $3.8 million. In addition, effective May 2020, we have reduced the salaries of our named executive officers by approximately 20%.

Factors affecting our performance

Number of billable tests

The growth in our test revenue is tied to the number of tests for which we bill third-party payers, institutions, partners or patients, which we refer to as billable tests. We typically bill for our services following delivery of the billable test report derived from testing samples and interpreting the results. We incur the expenses associated with a test in the period in which the test is processed regardless of when payment is received with respect to that test. We believe the number of billable tests in any period is the most important indicator of the growth in our test revenue, and with time, this will translate into the number of customers we add to our platform.

Success obtaining and maintaining reimbursement

Our ability to increase the number of billable tests and our revenue will depend in part on our success achieving broad reimbursement coverage and laboratory service contracts for our tests from third-party payers and agreements with institutions and partners. Reimbursement may depend on a number of factors, including a payer’s determination that a test is appropriate, medically necessary and cost-effective, as well as whether we are in contract, where we get paid more consistently and at higher rates. Because each payer makes its own decision as to whether to establish a policy or enter into a contract to reimburse for our testing services and specific tests, seeking these approvals is a time-consuming and costly process. In addition, clinicians and patients may decide not to order our tests if the cost of the test is not covered by insurance. Because we require an ordering physician to requisition a test, our revenue growth also depends on our ability to successfully promote the adoption of our testing services and expand our base of ordering clinicians. We believe that establishing coverage and obtaining contracts from third-party payers is an important factor in gaining adoption by ordering clinicians. Our arrangements for laboratory services with payers cover approximately 295 million lives, comprised of Medicare, all national commercial health plans, and Medicaid in most states, including California (Medi-Cal), our home state.

In cases where we have established reimbursement rates with third-party payers, we face additional challenges in complying with their procedural requirements for reimbursement. These requirements may vary from payer to payer, and it may be time-consuming and require substantial resources to meet these requirements. We may also experience delays in or denials of coverage if we do not adequately comply with these requirements. In

addition, we have experienced, and may continue to experience, delays in reimbursement when we transition to being an in-network provider with a payer.

We expect to continue to focus our resources on increasing adoption of, and expanding coverage and reimbursement for, our current tests, tests provided by companies we acquire and any future tests we may develop. However, if we are not able to continue to obtain and maintain adequate reimbursement from third-party payers, institutions and partners for our testing services and expand the base of clinicians and patients ordering our tests, we may not be able to effectively increase the number of billable tests or our revenue.

Ability to lower the costs associated with performing our tests

Reducing the costs associated with performing our genetic tests is both a focus and a strategic objective of ours. Over the long term, we will need to reduce the cost of raw materials by improving the output efficiency of our assays and laboratory processes, modifying our platform-agnostic assays and laboratory processes to use materials and technologies that provide equal or greater quality at lower cost, improve how we manage our materials, port some tests onto a next generation sequencing platform and negotiate favorable terms for our materials purchases. Our acquisition of Singular Bio is a component of this objective and we expect the technology acquired in this transaction, once developed, to help decrease the costs associated with our NIPS offering. We also intend to continue to design and implement hardware and software tools that are designed to reduce personnel-related costs for both laboratory and clinical operations/medical interpretation by increasing personnel efficiency and thus lowering labor costs per test. Finally, we will need to reduce our costs of providing tests internationally to enable us to expand more rapidly outside of the United States.

Ability to expand our genetic content

Our focus on reducing the average cost per test will have a countervailing force — increasing the number of tests we offer and the content of each test. We intend to continue to expand our test menus by steadily releasing additional genetic content for the same or lower prices per test, ultimately leading to affordable whole genome services. The breadth and flexibility of our offering will be a critical factor in our ability to address new markets, including internationally, for genetic testing services. Both of these, in conjunction with our continued focus on strategic partnerships, will be important to our ability to continue to grow the volume of billable tests we deliver.

Investment in our business and timing of expenses

We plan to continue to invest in our genetic testing and information management business. We deploy state-of-the-art and costly technologies in our genetic testing services, and we intend to continue to scale our infrastructure, including our testing capacity and information systems. We also expect to incur software development costs as we seek to further automate our laboratory processes and our genetic interpretation and report sign-out procedures, scale our customer service capabilities to improve our customers' experience, and expand the functionality of our website. We will incur costs related to marketing and branding as we spread our initiatives beyond our current customer base and focus on providing access to customers through our website. We have hired additional personnel as necessary to support anticipated growth, including software engineers, sales and marketing personnel, billing personnel, research and development personnel, medical specialists, biostatisticians and geneticists. We will also incur additional costs related to the expansion of our production facilities in San Francisco and Irvine to accommodate growth and as we expand internationally. In addition, we expect to incur ongoing expenses as a result of operating as a public company. The expenses we incur may vary significantly by quarter as we focus on building out different aspects of our business.

How we recognize revenue

We generally recognize revenue on an accrual basis, which is when a customer obtains control of the promised goods or services, typically a test report. Accrual amounts recognized are based on estimates of the consideration that we expect to receive and such estimates are adjusted and subsequently recorded until fully settled. Changes to such estimates may increase or decrease revenue recognized in future periods. Revenue from our tests may not be equal to billed amounts due to a number of factors, including differences in reimbursement rates, the amounts of patient copayments, the existence of secondary payers and claim denials.

Financial overview

Revenue

We primarily generate revenue from the sale of our tests, which provide the analysis and associated interpretation of the sequencing of parts of the genome. Clients are billed upon delivery of test results. Our ability to increase our revenue will depend on our ability to increase our market penetration, obtain contracted reimbursement coverage from third-party payers, sign contracts with institutions and partners, and increase the rate at which we are paid for tests performed.

Cost of revenue

Cost of revenue reflects the aggregate costs incurred in delivering test results to clinicians and patients and includes expenses for materials and supplies, personnel-related costs, equipment and infrastructure expenses associated with testing and allocated overhead including rent, equipment depreciation, amortization of acquired intangibles and utilities. Costs associated with performing our tests are recorded as the patient's sample is processed. We expect cost of revenue to generally increase in line with the increase in the number of tests we perform, however we expect a future increase in amortization of acquired intangible assets which is not dependent on sample volume. We anticipate our cost per test will generally decrease over time due to the efficiencies we expect to gain as test volume increases and from automation and other cost reductions, although the cost per test may fluctuate from quarter to quarter. These reductions in cost per test will be likely be offset by new tests which often have a higher cost per test during the introductory phases before we are able to gain efficiencies.

Operating expenses

Our operating expenses are classified into three categories: research and development, selling and marketing, and general and administrative. For each category, the largest component is personnel-related costs, which include salaries, employee benefit costs, bonuses, commissions, as applicable, and stock-based compensation expense.

Research and development

Research and development expenses represent costs incurred to develop our technology and future tests. These costs are principally for process development associated with our efforts to expand the number of genes we can evaluate in our tests and with our efforts to lower the cost of performing our tests. In addition, we incur process development costs to further develop the software we use to operate our laboratory, analyze the data it generates, process customer orders, enable ease of customer ordering, deliver reports and automate our business processes. These costs consist of personnel-related costs, laboratory supplies and equipment expenses, consulting costs and allocated overhead including rent, information technology, equipment depreciation, amortization of intangible assets and utilities.

We expense all research and development costs in the periods in which they are incurred. Our research and development expenses have increased as we continued our efforts to develop additional tests, made investments to reduce testing costs, streamlined our technology to provide patients access to testing, scaled our business domestically and internationally and acquired and integrated new technologies. In the near term, we expect these expenses to moderate as we titrate spending in response to reduced test volume related to COVID-19. Additionally, we expect stock-based compensation to significantly increase in future periods related to equity awards in connection with Singular Bio which we acquired in June 2019 and Diploid which we acquired in March 2020.

Selling and marketing

Selling and marketing expenses consist of personnel-related costs, client service expenses, advertising and marketing expenses, educational and promotional expenses, market research and analysis, and allocated overhead including rent, information technology, equipment depreciation, amortization of acquired intangibles, and utilities. We expect our selling and marketing expenses to decrease in subsequent quarters of 2020 as we focus on moderating our marketing and advertising spending and as a result of the reduction in our salesforce, however, these costs may fluctuate from quarter to quarter.

General and administrative

General and administrative expenses include executive, finance and accounting, billing and collections, legal and human resources functions as well as other administrative costs. These expenses include personnel-related

costs; audit, accounting and legal expenses; consulting costs; allocated overhead including rent, information technology, equipment depreciation, and utilities; costs incurred in relation to our co-development agreements; and post-combination expenses incurred in relation to companies we acquire. We expect our general and administrative expenses to decrease in the second half of 2020 as a result of the reduction in our headcount and as we reduce discretionary spending in response to the impact of COVID-19, however, these costs may fluctuate from quarter to quarter.

Other income, net

Other income, net, primarily consists of adjustments to the fair value of our stock payable liabilities and income generated from our cash equivalents and marketable securities.

Interest expense

Interest expense is attributable to debt financing, including convertible senior notes issued in September 2019 ("Convertible Senior Notes"), and finance leases. See Note 8, “Commitments and contingencies” in the Notes to Condensed Consolidated Financial Statements included elsewhere in this report.

Critical accounting policies and estimates

Management’s discussion and analysis of our financial condition and results of operations is based on our consolidated financial statements, which have been prepared in accordance with U.S. generally accepted accounting principles, or U.S. GAAP. The preparation of these financial statements requires us to make judgments, estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the financial statements, as well as the reported revenue generated and expenses incurred during the reporting periods. We evaluate our estimates on an ongoing basis. Our estimates are based on current facts, our historical experience and on various other factors that we believe are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying value of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions and any such differences may be material. We believe that the accounting policies discussed below are critical to understanding our historical and future performance, as these policies relate to the more significant areas involving management’s judgments and estimates.

There have been no material changes to our critical accounting policies and estimates as compared to the critical accounting policies and estimates described in our Annual Report on Form 10-K for the fiscal year ended December 31, 2019.

Results of operations

Three Months Ended March 31, 2020 and 2019

The following sets forth our consolidated statements of operations data for each of the periods indicated (in thousands, except percentage changes). Our historical results are not necessarily indicative of our results of operations to be expected for any future period.

	Three Months Ended March 31,		Dollar Change	% Change
	2020	2019		
Revenue:				
Test revenue	$ 63,078	$ 39,619	$ 23,459	59%
Other revenue	1,170	934	236	25%
Total revenue	64,248	40,553	23,695	58%
Cost of revenue	40,422	21,254	19,168	90%
Research and development	55,668	17,994	37,674	209%
Selling and marketing	42,120	24,193	17,927	74%
General and administrative	23,822	13,319	10,503	79%
Loss from operations	(97,784)	(36,207)	(61,577)	170%
Other income, net	4,708	638	4,070	638%
Interest expense	(5,451)	(2,108)	(3,343)	159%
Net loss	$ (98,527)	$ (37,677)	$ (60,850)	162%

Revenue

The increase in total revenue of $23.7 million for the three months ended March 31, 2020 compared to the same period in 2019 was due primarily to increased test volume. Billable test volumes increased to approximately 151,000 in the three months ended March 31, 2020 compared to 87,000 in the same period of 2019, an increase of 74 percent. While our test volumes increased in comparison to the prior year period, we began to see a significant decrease in the second half of March 2020 as a result of COVID-19 which continued into May 2020. Average revenue per test decreased to $418 per test in the three months ended March 31, 2020 compared to $455 per test in the comparable prior period primarily due to changes in payer and product mix, as well as reductions in pricing for some payers as we focus on providing cost effective genetic testing.

Cost of revenue

The increase in the cost of revenue of $19.2 million for the three months ended March 31, 2020 compared to the same period in 2019 was primarily due to costs associated with increased test volume, partially offset by the effect of cost efficiencies. For the three months ended March 31, 2020, the number of samples accessioned increased to approximately 154,000 from approximately 94,000 for the same period in 2019. Cost per sample accessioned was $262 in the three months ended March 31, 2020 compared to $226 for the same period in 2019. The cost per sample accessioned increased primarily due to increase in amortization of acquired intangible assets of $2.4 million as well as changes in product mix. These increases were partially offset by production improvements which resulted in material efficiencies and automation and software improvements which reduced the medical interpretation time per report.

Research and development

The increase in research and development expense of $37.7 million for the three months ended March 31, 2020 compared to the same period in 2019 was due to the growth of the business as well as for costs related to our acquisition of Singular Bio, Inc. in June 2019. The increase primarily consisted of the following elements as we invest in research and development initiatives as we grow: personnel-related costs increased by $35.1 million, principally reflecting increased headcount as well as $18.8 million of stock-based compensation related to equity awards granted to new employees who joined Invitae in connection with our acquisition of Singular Bio, an increase in technology costs of $1.5 million, and an increase in professional fees of $1.2 million.

Selling and marketing

The increase in selling and marketing expense of $17.9 million for the three months ended March 31, 2020 compared to the same period in 2019 was due primarily to the growth of the business and increased spending on marketing initiatives and principally consisted of the following elements: personnel-related costs increased by $10.9 million primarily reflecting increased headcount and includes an increase in sales commissions of $3.0 million; $3.2 million due to increases in marketing costs principally for branding initiatives and advertising; travel-related costs increased by $1.2 million; an increase of $1.2 million in allocations from other functional areas; and professional fees increased by $0.9 million.

General and administrative

The increase in general and administrative expense of $10.5 million for the three months ended March 31, 2020 compared to the same period in 2019 was due primarily to the growth of the business and principally consisted of the following elements: personnel-related costs increased by $6.8 million; legal and accounting services increased by $2.9 million which includes acquisition-related costs of $0.4 million related to Diploid; occupancy costs increased by $0.9 million; and travel-related costs increased by $0.8 million.

These cost increases were partially offset by an increase of $2.8 million in allocations of technology and facilities-related expenses to other functional areas.

Other income, net

The increase in other income, net of $4.1 million for the three months ended March 31, 2020 compared to the same period in 2019 was due principally to fair value adjustments related to our stock payable liabilities and increases in interest income generated on our cash equivalents and marketable securities.

Interest expense

The increase in interest expense of $3.3 million for the three months ended March 31, 2020 compared to the same period in 2019 was due to increased borrowings under our debt facilities as compared to the prior year period.

Liquidity and capital resources

Liquidity and capital expenditures

We have incurred net losses since our inception. For the three months ended March 31, 2020 and 2019, we had net losses of $98.5 million and $37.7 million, respectively, and we expect to incur additional losses in the near-term future. At March 31, 2020, we had an accumulated deficit of $857.2 million. While our revenue has increased over time, we may never achieve revenue sufficient to offset our expenses.

Since inception, our operations have been financed primarily by net proceeds from sales of our capital stock, fees collected from our customers as well as borrowing from debt facilities and the issuance of Convertible Senior Notes.

In March 2019, we issued, in an underwritten public offering, an aggregate of 10.4 million shares of our common stock at a price of $19.00 per share, for gross proceeds of $196.7 million and net proceeds of $184.5 million. During 2019, we issued 0.8 million shares of common stock at an average price of $25.71 per share in an "at the market" offering for aggregate proceeds of $20.2 million and net proceeds of $19.5 million. In April 2020, we issued, in an underwritten public offering, an aggregate of 20.4 million shares of our common stock at a price of $9.00 per share, for gross proceeds of $184.0 million and net proceeds of approximately $173.0 million after deducting underwriting discounts and commissions and offering expenses.

In September 2019, we issued $350.0 of aggregate principal amount of Convertible Senior Notes which bear cash interest at a rate of 2.0% per year. Also in September 2019, we used the funds received through the issuance of our Convertible Senior Notes to settle our Note Purchase Agreement we entered into in November 2018.

At March 31, 2020 and December 31, 2019, we had $301.0 million and $398.0 million, respectively, of cash, cash equivalents, restricted cash and marketable securities.

Our primary uses of cash are to fund our operations as we continue to grow our business, enter into partnerships and potentially to acquire businesses and technologies. Cash used to fund operating expenses is affected by the timing of when we pay expenses, as reflected in the change in our outstanding accounts payable and accrued expenses.

We have incurred substantial losses since our inception, and we expect to continue to incur losses in the near term. We believe our existing cash, cash equivalents and marketable securities as of March 31, 2020 and fees collected from the sale of our tests will be sufficient to meet our anticipated cash requirements for the foreseeable future.

We may need additional funding to finance operations prior to achieving profitability or should we make additional acquisitions. We regularly consider fundraising opportunities and will determine the timing, nature and size of future financings based upon various factors, including market conditions and our operating plans. We may in the future elect to finance operations by selling equity or debt securities or borrowing money. We also may elect to finance future acquisitions. In addition, the recent COVID-19 pandemic has caused disruption in the capital markets. It could make financing more difficult and/or expensive and we may not be able to obtain such financing on terms acceptable to us or at all. If we issue equity securities, dilution to stockholders may result. Any equity securities issued may also provide for rights, preferences or privileges senior to those of holders of our common stock. If we raise funds by issuing additional debt securities, these debt securities would have rights, preferences and privileges senior to those of holders of our common stock. In addition, the terms of additional debt securities or borrowings could impose significant restrictions on our operations. If additional funding is required, there can be no assurance that additional funds will be available to us on acceptable terms on a timely basis, if at all. If we are unable to obtain additional funding when needed, we will need to curtail planned activities to reduce costs. Doing so will likely have an unfavorable effect on our ability to execute on our business plan and have an adverse effect on our business, results of operations and future prospects.

The following table summarizes our cash flows (in thousands):

	Three Months Ended March 31,	
	2020	2019
Cash used in operating activities	$ (62,360)	$ (28,366)
Cash provided by (used in) investing activities	800	(17,545)
Cash provided by financing activities	551	186,120
Net increase (decrease) in cash, cash equivalents and restricted cash	$ (61,009)	$ 140,209

Cash flows from operating activities

For the three months ended March 31, 2020, cash used in operating activities of $62.4 million principally resulted from our net loss of $98.5 million, partially offset by non-cash charges of $29.3 million for stock-based compensation, $6.1 million for depreciation and amortization, $3.6 million for amortization of debt discount and issuance costs related to our Convertible Senior Notes, and $3.4 million resulting from the remeasurements of liabilities associated with our business combinations. The net effect on cash of changes in net operating assets was an increase of cash of $1.2 million.

For the three months ended March 31, 2019, cash used in operating activities of $28.4 million principally resulted from our net loss of $37.7 million, partially offset by non-cash charges of $5.2 million for stock-based compensation, and $3.3 million for depreciation and amortization. The net effect on cash of changes in net operating assets was an increase of cash of $0.5 million.

Cash flows from investing activities

For the three months ended March 31, 2020, cash provided by investing activities of $0.8 million was due to net sales and maturities of marketable securities of $37.5 million partially offset by net cash used to acquire Diploid of $32.2 million and by cash used for purchases of property and equipment of $3.8 million.

For the three months ended March 31, 2019, cash used in investing activities of $17.5 million was due to net purchases of marketable securities of $14.8 million and cash used for purchases of property and equipment of $2.8 million.

Cash flows from financing activities

For the three months ended March 31, 2020, cash provided by financing activities of $0.6 million consisted of cash received from issuances of common stock of $1.2 million, partially offset by finance lease payments of $0.6 million.

For the three months ended March 31, 2019, cash provided by financing activities of $186.1 million consisted of net proceeds from the public offering of common stock of $184.5 million and cash received from issuances of common stock totaling $2.1 million, including stock option exercises of $2.0 million and $0.1 million received from exercises of warrants. These cash inflows were partially offset by finance lease payments of $0.5 million.

Contractual obligations

The following table summarizes our contractual obligations, including interest, as of March 31, 2020 (in thousands):

Contractual obligations:	Remainder of 2020	2021 and 2022	2023 and 2024	2025 and beyond	Total
Operating leases	$ 7,770	$ 21,302	$ 20,984	$ 18,459	$ 68,515
Finance leases	1,306	1,222	—	—	2,528
Convertible Senior Notes	—	—	350,000	—	350,000
Purchase commitments	4,452	3,815	860	108	9,235
Total	$ 13,528	$ 26,339	$ 371,844	$ 18,567	$ 430,278

See Note 8, "Commitments and contingencies" in the Notes to Condensed Consolidated Financial Statements for additional details regarding our leases, Convertible Senior Notes and purchase commitments.

Off-balance sheet arrangements

We have not entered into any off-balance sheet arrangements.

Recent accounting pronouncements

See “Recent accounting pronouncements” in Note 2, “Summary of significant accounting policies” in the Notes to Condensed Consolidated Financial Statements included elsewhere in this report for a discussion of recently adopted accounting pronouncements and accounting pronouncements not yet adopted, and their expected effect on our financial position and results of operations.

ITEM 3. Quantitative and Qualitative Disclosures About Market Risk.

We are exposed to market risks in the ordinary course of our business. These risks primarily relate to interest rates. Our cash, cash equivalents, restricted cash and marketable securities totaled $301.0 million at March 31, 2020, and consisted of bank deposits, money market funds, U.S. treasury notes, and U.S. government agency securities. Such interest-bearing instruments carry a degree of risk; however, because our investments are primarily high-quality credit instruments with short-term durations with high-quality institutions, we have not been exposed to, nor do we anticipate being exposed to, material risks due to changes in interest rates. At March 31, 2020, a hypothetical 1.0% (100 basis points) increase or decrease in interest rates would not have resulted in a material change in the fair value of our cash equivalents and portfolio of marketable securities. Fluctuations in the value of our cash equivalents and portfolio of marketable securities caused by a change in interest rates (gains or losses on the carrying value) are recorded in other comprehensive gain (loss) and are realized only if we sell the underlying securities prior to maturity or declines in fair value are determined to be other-than-temporary.

Although our Convertible Senior Notes are based on a fixed rate, changes in interest rates could impact their fair market value. As of March 31, 2020, the fair market value of the Convertible Senior Notes was $310.8 million. For additional information about the Convertible Senior Notes, see Note 8, “Commitments and contingencies” in Notes to Condensed Consolidated Financial Statements in Part I, Item 1 of this Quarterly Report.

ITEM 4. Controls and Procedures.

(a) Evaluation of disclosure controls and procedures

We maintain “disclosure controls and procedures,” as such term is defined in Rule 13a-15(e) under the Securities Exchange Act of 1934, or Exchange Act, that are designed to ensure that information required to be disclosed by us in reports that we file or submit under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in Securities and Exchange Commission rules and forms, and that such information is accumulated and communicated to our management, including our principal executive officer and principal financial and accounting officer, as appropriate, to allow timely decisions regarding required disclosure. In designing and evaluating our disclosure controls and procedures, management recognized that disclosure controls and procedures, no matter how well conceived and operated, can provide only reasonable, not absolute, assurance that the objectives of the disclosure controls and procedures are met. Our disclosure controls and procedures have been designed to meet reasonable assurance standards. Additionally, in designing disclosure controls and procedures, our management necessarily was required to apply its judgment in evaluating the cost-benefit relationship of possible disclosure controls and procedures. The design of any disclosure controls and procedures also is based in part upon certain assumptions about the likelihood of future events, and there can be no assurance that any design will succeed in achieving its stated goals under all potential future conditions.

Based on their evaluation as of the end of the period covered by this Quarterly Report on Form 10-Q, our Chief Executive Officer (our principal executive officer) and Chief Financial Officer (our principal financial and accounting officer) have concluded that, as of such date, our disclosure controls and procedures were effective at the reasonable assurance level.

(b) Changes in internal control over financial reporting

During the quarterly period covered by this Quarterly Report on Form 10-Q, there were no changes in our internal control over financial reporting 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.

We are not a party to any material legal proceedings on the date of this report. We may from time to time become involved in legal proceedings arising in the ordinary course of business, and the resolution of any such claims could be material.

ITEM 1A. Risk Factors.

Risks related to our business and strategy

We face risks related to health epidemics, including the recent COVID-19 pandemic, which could have a material adverse effect on our business and results of operations.

Our business has been and could continue to be adversely affected by a widespread outbreak of contagious disease, including the recent pandemic of respiratory illness caused by a novel coronavirus known as COVID-19. Global health concerns relating to the COVID-19 pandemic have negatively affected the macroeconomic environment, and the pandemic has significantly increased economic volatility and uncertainty.

The pandemic has resulted in government authorities implementing numerous measures to try to contain the virus, such as travel bans and restrictions, quarantines, shelter-in-place or stay-at-home orders, and business shutdowns. For example, our personnel located at our headquarters and other offices in California, elsewhere in the United States and in other countries, are currently subject to shelter-in-place or stay-at-home orders from state and local governments. These measures have adversely impacted and may further impact our employees and operations and the operations of our customers, suppliers and business partners, and may continue to negatively impact spending patterns, payment cycles and insurance coverage levels. These measures have adversely affected and may continue to adversely affect demand for our tests. Many of our customers, including hospitals and clinics, have suspended non-emergency appointments and services, which has resulted in a significant decrease in our test volume. Travel bans, restrictions and border closures have also impacted our ability to ship test kits to and receive samples from our customers. In addition, certain aspects of our business, such as laboratory processes, cannot be conducted remotely. These measures by government authorities may remain in place for a significant period of time, and even if they are lifted, they may be implemented again if the COVID-19 pandemic returns in the future. These measures are likely to continue to adversely affect our test volume, sales activities and results of operations.

The spread of COVID-19 has caused us to modify our business practices (including employee travel, mandating that all non-essential personnel work from home, temporary closures of our offices, and cancellation of physical participation in sales activities, meetings, events and conferences), and we may take further actions as may be required by government authorities or that we determine are in the best interests of our employees, customers and business partners. Such actions could also impact our ability to fully integrate businesses we have acquired and those we may acquire in the future. There is no certainty that such actions will be sufficient to mitigate the risks posed by the virus or otherwise be satisfactory to government authorities. If significant portions of our workforce are unable to work effectively, including due to illness, quarantines, social distancing, government actions or other restrictions in connection with the COVID-19 pandemic, our operations will be impacted.

The extent to which the COVID-19 pandemic continues to impact our business, results of operations and financial condition will depend on future developments, which are highly uncertain and cannot be predicted, including, but not limited to, the duration and spread of the pandemic, the actions to contain the virus and treat its impact, and how quickly and to what extent normal economic and operating activities can resume. The COVID-19 pandemic could limit the ability of our customers, suppliers and business partners to perform, including third-party payers' ability to make timely payments to us during and following the pandemic. We may also experience a shortage of laboratory supplies or a suspension of services from other laboratories or third parties. Even after the COVID-19 pandemic has subsided, we may continue to experience an adverse impact to our business as a result of its global economic impact, including any recession that has occurred or may occur in the future.

Specifically, difficult macroeconomic conditions, such as decreases in per capita income and level of disposable income, increased and prolonged unemployment or a decline in consumer confidence as a result of the COVID-19 pandemic, as well as limited or significantly reduced points of access of our tests, could have a material adverse effect on the demand for our tests. Under difficult economic conditions, consumers may seek to reduce discretionary spending by forgoing our tests. Decreased demand for our tests, particularly in the United States, has negatively affected and could continue negatively affect our overall financial performance. Because a

significant portion of our revenue is concentrated in the United States, where the impact of COVID-19 has been significant, the COVID-19 pandemic has had and could continue to have a disproportionately negative impact on our business and financial results.

There are no comparable recent events which may provide guidance as to the effect of the spread of COVID-19 and a pandemic, and, as a result, the ultimate impact of the COVID-19 pandemic or a similar health epidemic is highly uncertain and subject to change. We do not yet know the full extent of COVID-19's impact on our business, our operations, or the global economy as a whole. However, the effects could have a material impact on our results of operations, and we will continue to monitor the situation closely.

We expect to continue incurring significant losses, and we may not successfully execute our plan to achieve or sustain profitability.

We have incurred substantial losses since our inception. For the three months ended March 31, 2020, our net loss was $98.5 million. For the years ended December 31, 2019, 2018 and 2017, our net losses were $242.0 million, $129.4 million and $123.4 million, respectively. At March 31, 2020, our accumulated deficit was $857.2 million. While our revenue has increased over time, we expect to continue to incur significant losses as we invest in our business. We incurred research and development expenses of $141.5 million, $63.5 million and $46.5 million in 2019, 2018, and 2017, respectively, and selling and marketing expenses of $122.2 million, $74.4 million, and $53.4 million in 2019, 2018, and 2017, respectively. We expect these losses may increase as we focus on scaling our business and operations and expanding our testing capabilities, which may also increase our operating expenses, and as we face decreases in test volume due to the impact of COVID-19. In addition, as a result of the integration of acquired businesses, we may be subject to unforeseen or additional expenditures, costs or liabilities. Our prior losses and expected future losses have had and may continue to have an adverse effect on our stockholders' equity, working capital and stock price. Our failure to achieve and sustain profitability in the future would negatively affect our business, financial condition, results of operations and cash flows, and could cause the market price of our common stock to decline.

We began operations in January 2010 and commercially launched our initial assay in late November 2013; accordingly, we have a relatively limited operating history upon which you can evaluate our business and prospects. Our limited commercial history makes it difficult to evaluate our current business and makes predictions about our future results, prospects or viability subject to significant uncertainty. Our prospects must be considered in light of the risks and difficulties frequently encountered by companies in their early stage of development, particularly companies in new and rapidly evolving markets such as ours. These risks include an evolving and unpredictable business model and the management of growth. To address these risks, we must, among other things, increase our customer base; implement and successfully execute our business and marketing strategy; identify, acquire and successfully integrate companies, assets or technologies in areas that are complementary to our business strategy; successfully enter into other strategic collaborations or relationships; obtain access to capital on acceptable terms and effectively utilize that capital; identify, attract, hire, retain, motivate and successfully integrate additional employees; continue to expand, automate and upgrade our laboratory, technology and data systems; obtain, maintain and expand coverage and reimbursement by healthcare payers; provide rapid test turnaround times with accurate results at low prices; provide superior customer service; and respond to competitive developments. We cannot assure you that we will be successful in addressing these risks, and the failure to do so could have a material adverse effect on our business, prospects, financial condition and results of operations.

We have acquired and may continue to acquire businesses or assets, form joint ventures or make investments in other companies or technologies that could harm our operating results, dilute our stockholders' ownership, or cause us to incur debt or significant expense.

As part of our business strategy, we have pursued and expect to continue to pursue acquisitions of complementary businesses or assets, as well as technology licensing arrangements. We also may pursue strategic alliances that leverage our core technology and industry experience to expand our offerings or distribution, or make investments in other companies. As an organization, we have limited experience with respect to acquisitions as well as the formation of strategic alliances and joint ventures.

In 2017, we established a leading position in family health genetic information services through the strategic acquisition of reproductive health testing capabilities, which included our acquisition of Good Start Genetics, Inc., or Good Start, a molecular diagnostics company focused on preimplantation and carrier screening for inherited disorders, and CombiMatrix Corporation, a company specializing in prenatal diagnosis, miscarriage analysis and pediatric developmental disorders. In 2017 we also acquired AltaVoice, formerly PatientCrossroads, a patient-centered data company with a global platform for collecting, curating, coordinating and delivering safeguarded data

from patients and clinicians, and Ommdom, Inc. and its product, CancerGene Connect, an end-to-end platform for collecting and managing genetic family histories to deliver personalized genetic risk information.

In the second quarter of 2019, we acquired Singular Bio, Inc., to assist in lowering the costs of our NIPS offering, in July 2019, we acquired Jungla Inc. to further enhance our genetic variant interpretation and the quality of results we deliver and in November 2019, we acquired Clear Genetics, Inc. to expand our ability to scale and deliver genetic information. In 2020, we acquired Orbicule BV operating under the name "Diploid" to enable us to quickly diagnose genetic disorders using artificial intelligence, as well as Genelex Solutions, LLC and YouScript Incorporated to bring pharmacogenetic testing and integrated clinical decision support to our offerings.

With respect to our acquired businesses and any acquisitions we may make in the future, we may not be able to integrate these acquisitions successfully into our existing business, and we could assume unknown or contingent liabilities. Any acquisitions by us also could result in significant write-offs or the incurrence of debt and contingent liabilities, any of which could harm our operating results. Furthermore, as we experienced in the past, the loss of customers, payers, partners or suppliers following the completion of any acquisitions by us could harm our business. Changes in services, sources of revenue, and branding or rebranding initiatives may involve substantial costs and may not be favorably received by customers, resulting in an adverse impact on our financial results, financial condition and stock price. Integration of an acquired company or business also may require management's time and resources that otherwise would be available for ongoing development of our existing business. We may also need to divert cash from other uses in order to fund these integration activities and these new businesses. Ultimately, we may not realize the anticipated benefits of any acquisition, technology license, strategic alliance, joint venture or investment, or these benefits may take longer to realize than we expected.

To finance any acquisitions or investments, we may raise additional funds. If we raise funds by issuing equity securities, dilution to our stockholders could result. Any equity securities issued also may provide for rights, preferences or privileges senior to those of holders of our common stock. If we raise funds by issuing debt securities, these debt securities would have rights, preferences and privileges senior to those of holders of our common stock. The terms of debt securities issued or borrowings could impose significant restrictions on our operations. If we raise funds through collaborations and licensing arrangements, we might be required to relinquish significant rights to our technologies or products, or grant licenses on terms that are not favorable to us. If the price of our common stock is low or volatile, we may not be able to acquire other companies for stock. In addition, our stockholders may experience substantial dilution as a result of additional securities we may issue for acquisitions. Open market sales of substantial amounts of our common stock issued to stockholders of companies we acquire could also depress our share price. Alternatively, we may raise additional funds for our acquisition activities through public or private financings. Additional funds may not be available on terms that are favorable to us, or at all.

If third-party payers, including managed care organizations, private health insurers and government health plans do not provide adequate reimbursement for our tests or we are unable to comply with their requirements for reimbursement, our commercial success could be negatively affected.

Our ability to increase the number of billable tests and our revenue will depend on our success achieving reimbursement for our tests from third-party payers. Reimbursement by a payer may depend on a number of factors, including a payer's determination that a test is appropriate, medically necessary, cost-effective and has received prior authorization.

Since each payer makes its own decision as to whether to establish a policy or enter into a contract to cover our tests, as well as the amount it will reimburse for a test, seeking these approvals is a time-consuming and costly process. In addition, the determination by a payer to cover and the amount it will reimburse for our tests will likely be made on an indication by indication basis. To date, we have obtained policy-level reimbursement approval or contractual reimbursement for some indications for our tests from most of the large commercial third-party payers in the United States, and the Centers for Medicare and Medicaid Services, or CMS, provides reimbursement for our multi-gene tests for hereditary breast and ovarian cancer-related disorders as well as colon cancer. We believe that establishing adequate reimbursement from Medicare is an important factor in gaining adoption from healthcare providers. Our claims for reimbursement from third-party payers may be denied upon submission, and we must appeal the claims. The appeals process is time consuming and expensive, and may not result in payment. In cases where there is not a contracted rate for reimbursement, there is typically a greater coinsurance or copayment requirement from the patient, which may result in further delay or decreased likelihood of collection.

In cases where we have established reimbursement rates with third-party payers, we face additional challenges in complying with their procedural requirements for reimbursement. These requirements often vary from payer to payer, and we have needed additional time and resources to comply with them. We have also experienced, and may continue to experience, delays in or denials of coverage if we do not adequately comply with

these requirements. Our third-party payers have also requested, and in the future may request, audits of the amounts paid to us. We have been required to repay certain amounts to payers as a result of such audits, and we could be adversely affected if we are required to repay other payers for alleged overpayments due to lack of compliance with their reimbursement policies. In addition, we have experienced, and may continue to experience, delays in reimbursement when we transition to being an in-network provider with a payer.

We expect to continue to focus our resources on increasing adoption of, and expanding coverage and reimbursement for, our current tests and any future tests we may develop or acquire. If we fail to expand and maintain broad adoption of, and coverage and reimbursement for, our tests, our ability to generate revenue could be harmed and our future prospects and our business could suffer.

Our inability to raise additional capital on acceptable terms in the future may limit our ability to develop and commercialize new tests and expand our operations.

We expect capital expenditures and operating expenses to increase over the next several years as we expand our infrastructure, commercial operations, research and development and selling and marketing activities and pursue and integrate acquisitions. We believe our existing cash and cash equivalents as of March 31, 2020 and revenue from sales of our tests will be sufficient to meet our anticipated cash requirements for our currently-planned operations for the foreseeable future. We may raise additional capital to finance operations prior to achieving profitability, or should we make additional acquisitions. We may seek to raise additional capital through equity offerings, debt financings, collaborations or licensing arrangements. Additional funding may not be available to us on acceptable terms, or at all. If we raise funds by issuing equity securities, dilution to our stockholders would result. Any equity securities issued also may provide for rights, preferences or privileges senior to those of holders of our common stock. The terms of debt securities issued or borrowings, if available, could impose significant restrictions on our operations.

The incurrence of additional indebtedness or the issuance of certain equity securities could result in increased fixed payment obligations and could also result in restrictive covenants, such as limitations on our ability to incur additional debt or issue additional equity, limitations on our ability to acquire or license intellectual property rights, and other operating restrictions that could adversely affect our ability to conduct our business. In addition, the issuance of additional equity securities by us, or the possibility of such issuance, may cause the market price of our common stock to decline. In the event that we enter into collaborations or licensing arrangements to raise capital, we may be required to accept unfavorable terms. These agreements may require that we relinquish or license to a third party on unfavorable terms our rights to tests we otherwise would seek to develop or commercialize ourselves, or reserve certain opportunities for future potential arrangements when we might be able to achieve more favorable terms. If we are not able to secure additional funding when needed, we may have to delay, reduce the scope of or eliminate one or more research and development programs, selling and marketing initiatives, or potential acquisitions. In addition, we may have to work with a partner on one or more aspects of our tests or market development programs, which could lower the economic value of those tests or programs to our company.

We face intense competition, which is likely to intensify further as existing competitors devote additional resources to, and new participants enter, the market. If we cannot compete successfully, we may be unable to increase our revenue or achieve and sustain profitability.

With the development of next generation sequencing, the clinical genetics market is becoming increasingly competitive, and we expect this competition to intensify in the future. We face competition from a variety of sources, including:

- dozens of relatively specialized competitors focused on inherited clinical genetics and gene sequencing, such as Ambry Genetics, a subsidiary of Konica Minolta Inc.; Athena Diagnostics and Blueprint Genetics, subsidiaries of Quest Diagnostics Incorporated; Baylor-Miraca Genetics Laboratories; Centogene AG; Connective Tissue Gene Test LLC, a subsidiary of Health Network Laboratories, L.P.; Cooper Surgical, Inc.; Emory Genetics Laboratory, a subsidiary of Eurofins Scientific; GeneDx, a subsidiary of OPKO Health, Inc.; Integrated Genetics, Sequenom Inc., Correlagen, and MNG Laboratories, subsidiaries of Laboratory Corporation of America Holdings; Myriad Genetics, Inc.; Natera, Inc.; Perkin Elmer, Inc.; PreventionGenetics, LLC; Progenity, Inc.; and Sema4 Genomics;
- a few large, established general testing companies with large market share and significant channel power, such as Laboratory Corporation of America Holdings and Quest Diagnostics Incorporated;

- a large number of clinical laboratories in an academic or healthcare provider setting that perform clinical genetic testing on behalf of their affiliated institutions and often sell and market more broadly; and
- a large number of new entrants into the market for genetic information ranging from informatics and analysis pipeline developers to focused, integrated providers of genetic tools and services for health and wellness including Illumina, Inc., which is also one of our suppliers.

Hospitals, academic medical centers and eventually physician practice groups and individual clinicians may also seek to perform at their own facilities the type of genetic testing we would otherwise perform for them. In this regard, continued development of equipment, reagents, and other materials as well as databases and interpretation services may enable broader direct participation in genetic testing and analysis.

Participants in closely related markets such as clinical trial or companion diagnostic testing could converge on offerings that are competitive with the type of tests we perform. Instances where potential competitors are aligned with key suppliers or are themselves suppliers could provide such potential competitors with significant advantages.

In addition, the biotechnology and genetic testing fields are intensely competitive both in terms of service and price, and continue to undergo significant consolidation, permitting larger clinical laboratory service providers to increase cost efficiencies and service levels, resulting in more intense competition.

We believe the principal competitive factors in our market are:

- breadth and depth of content;
- quality;
- reliability;
- accessibility of results;
- turnaround time of testing results;
- price and quality of tests;
- coverage and reimbursement arrangements with third-party payers;
- convenience of testing;
- brand recognition of test provider;
- additional value-added services and informatics tools;
- client service; and
- quality of website content.

Many of our competitors and potential competitors have longer operating histories, larger customer bases, greater brand recognition and market penetration, higher margins on their tests, substantially greater financial, technological and research and development resources, selling and marketing capabilities, lobbying efforts, and more experience dealing with third-party payers. As a result, they may be able to respond more quickly to changes in customer requirements, devote greater resources to the development, promotion and sale of their tests than we do, sell their tests at prices designed to win significant levels of market share, or obtain reimbursement from more third-party payers and at higher prices than we do. We may not be able to compete effectively against these organizations. Increased competition and cost-saving initiatives on the part of governmental entities and other third-party payers are likely to result in pricing pressures, which could harm our sales, profitability or ability to gain market share. In addition, competitors may be acquired by, receive investments from or enter into other commercial relationships with larger, well-established and well-financed companies as use of next generation sequencing for clinical diagnosis and preventative care increases. Certain of our competitors may be able to secure key inputs from vendors on more favorable terms, devote greater resources to marketing and promotional campaigns, adopt more aggressive pricing policies and devote substantially more resources to website and systems development than we can. In addition, companies or governments that control access to genetic testing through umbrella contracts or regional preferences could promote our competitors or prevent us from performing certain services. In addition, some of our competitors have obtained approval or clearance for certain of their tests from the U.S. Food and Drug Administration, or FDA. If payers decide to reimburse only for tests that are FDA-approved or FDA-cleared, or if they are more likely to reimburse for such tests, we may not be able to compete effectively unless we obtain similar approval or clearance for our tests. If we are unable to compete successfully against current and future competitors,

we may be unable to increase market acceptance and sales of our tests, which could prevent us from increasing our revenue or achieving profitability and could cause our stock price to decline.

We may not be able to manage our future growth effectively, which could make it difficult to execute our business strategy.

Our expected future growth could create a strain on our organizational, administrative and operational infrastructure, including laboratory operations, quality control, customer service, marketing and sales, and management. We may not be able to maintain the quality of or expected turnaround times for our tests, or satisfy customer demand as it grows. We will likely need to continue expanding our sales force to facilitate our growth, and we may have difficulties locating, recruiting, training and retaining sales personnel. Our ability to manage our growth effectively will require us to continue to improve our operational, financial and management controls, as well as our reporting systems and procedures. As we grow, any failure of our controls or interruption of our production facilities or systems could have a negative impact on our business and financial operations. We plan to implement new enterprise software systems in a number of areas affecting a broad range of business processes and functional areas. The time and resources required to implement these new systems is uncertain, and failure to complete these activities in a timely and efficient manner could adversely affect our operations. Future growth in our business could also make it difficult for us to maintain our corporate culture. If we are unable to manage our growth effectively, it may be difficult for us to execute our business strategy and our business could be harmed.

Security breaches, loss of data and other disruptions could compromise sensitive information related to our business or prevent us from accessing critical information and expose us to liability, which could adversely affect our business and our reputation.

In the ordinary course of our business, we collect and store sensitive data, including protected health information, or PHI, personally identifiable information, credit card information, intellectual property and proprietary business information owned or controlled by ourselves or our customers, payers and other parties. We manage and maintain our applications and data utilizing a combination of on-site systems, managed data center systems and cloud-based data center systems. We also communicate sensitive patient data through our various customer tools and platforms. In addition to storing and transmitting sensitive personal information that is subject to myriad legal protections, these applications and data encompass a wide variety of business-critical information including research and development information, commercial information, and business and financial information. We face a number of risks relative to protecting this critical information, including loss of access risk, inappropriate disclosure, inappropriate modification, and the risk of our being unable to adequately monitor and modify our controls over our critical information. Any technical problems that may arise in connection with our data and systems, including those that are hosted by third-party providers, could result in interruptions in our business and operations. These types of problems may be caused by a variety of factors, including infrastructure changes, human or software errors, viruses, security attacks, fraud, spikes in customer usage and denial of service issues. From time to time, large third-party web hosting providers have experienced outages or other problems that have resulted in their systems being offline and inaccessible. Such outages could materially impact our business and operations.

The secure processing, storage, maintenance and transmission of this critical information are vital to our operations and business strategy, and we devote significant resources to protecting such information. Although we take what we believe to be reasonable and appropriate measures to protect sensitive information from unauthorized access or disclosure, our information technology and infrastructure may be vulnerable to attacks by hackers or viruses or breached due to employee error, malfeasance or other disruptions. Any such breach or interruption could compromise our networks and the information stored there could be accessed by unauthorized parties, altered, publicly disclosed, lost or stolen. Any such access, disclosure or other loss of information could result in legal claims or proceedings, liability under federal or state laws that protect the privacy of personal information, such as but not limited to the Health Insurance Portability and Accountability Act of 1996, or HIPAA, the Health Information Technology for Economic and Clinical Heath Act, or HITECH, state data security and data breach notification laws, and related regulatory penalties. Although we have implemented security measures and a formal, dedicated enterprise security program to prevent unauthorized access to patient data, our various customer tools and platforms are currently accessible through our online portal and/or through our mobile applications, and there is no guarantee we can protect our online portal or our mobile applications from breach. Unauthorized access, loss or dissemination could also disrupt our operations (including our ability to conduct our analyses, provide test results, bill payers or patients, process claims and appeals, provide customer assistance, conduct research and development activities, collect, process and prepare company financial information, provide information about our tests and other patient and physician education and outreach efforts through our website, and manage the administrative aspects of our business) and damage our reputation, any of which could adversely affect our business.

In addition to security risks, we also face privacy risks. While we have policies that govern our privacy practices and procedures that aim to keep our practices consistent with such policies, such procedures are not invulnerable to human error. Should we inadvertently break the privacy promises we make to patients or consumers, we could receive a complaint from an affected individual or interested privacy regulator, such as the Federal Trade Commission, or FTC, or a state Attorney General. This risk is heightened given the sensitivity of the data we collect.

Penalties for failure to comply with a requirement of HIPAA and HITECH vary significantly, and include civil monetary penalties of up to $1.5 million per calendar year for each provision of HIPAA that is violated. A person who knowingly obtains or discloses individually identifiable health information in violation of HIPAA may face a criminal penalty of up to $50,000 and up to one-year imprisonment. The criminal penalties increase if the wrongful conduct involves false pretenses or the intent to sell, transfer or use identifiable health information for commercial advantage, personal gain or malicious harm. Penalties for unfair or deceptive acts or practices under the FTC Act or state Unfair and Deceptive Acts and Practices, or UDAP, statutes may also vary significantly.

There has been unprecedented activity in the development of data protection regulation around the world. As a result, the interpretation and application of consumer, health-related and data protection laws in the United States, Europe and elsewhere are often uncertain, contradictory and in flux. The European Union's General Data Protection Regulation, or GDPR, took effect in May 2018. The GDPR applies to any business, regardless of its location, that provides goods or services to residents in the European Union. The GDPR imposes strict requirements on controllers and processors of personal data, including special protections for "sensitive information" which includes health and genetic information of data subjects residing in the European Union. The GDPR also grants individuals various rights in relation to their personal data including the right to access, rectification, objection to processing and deletion, and provides an individual with an express right to seek legal remedies if the individual believes his or her rights have been violated. Failure to comply with the requirements of the GDPR and the related national data protection laws of the member states of the European Union, which may deviate slightly from the GDPR, may result in significant fines.

Additionally, the implementation of GDPR has led other jurisdictions to either amend or propose legislation to amend their existing data privacy and cybersecurity laws to resemble the requirements of GDPR. For example, on June 28, 2018, California adopted the California Consumer Privacy Act of 2018, or CCPA, and amended the law in September 2018 to exempt all PHI collected by certain parties subject to HIPAA. The effective date of the CCPA is January 1, 2020. On October 10, 2019, the California Attorney General issued draft regulations for the CCPA. The regulations are still subject to change but are expected to be finalized by July 1, 2020. The Attorney General has stated that even though the regulations will not be finalized before the effective date of the CCPA, the Attorney General may still bring enforcement actions for CCPA violations occurring after January 1, 2020. The CCPA gives California residents expanded rights to access and delete their personal information, opt out of certain personal information sharing, and receive detailed information about how their personal information is used. The CCPA provides for civil penalties for violations, as well as a private right of action for data breaches that is expected to increase data breach litigation.

It is possible the GDPR, CCPA and other data protection laws may be interpreted and applied in a manner that is inconsistent with our practices. If so, this could result in government-imposed fines or orders requiring that we change our practices, which could adversely affect our business. In addition, these privacy regulations may differ from country to country and state to state, and may vary based on whether testing is performed in the United States or in the local country. Complying with these various laws and regulations could cause us to incur substantial costs or require us to change our business practices and compliance procedures in a manner adverse to our business. We can provide no assurance that we are or will remain in compliance with diverse privacy and security requirements in all of the jurisdictions in which we do business. Failure to comply with privacy and security requirements could result in civil or criminal penalties, which could have a material adverse effect on our business.

We rely on highly skilled personnel in a broad array of disciplines and, if we are unable to hire, retain or motivate these individuals, or maintain our corporate culture, we may not be able to maintain the quality of our services or grow effectively.

Our performance, including our research and development programs and laboratory operations, largely depend on our continuing ability to identify, hire, develop, motivate and retain highly skilled personnel for all areas of our organization, including software developers, geneticists, biostatisticians, certified laboratory scientists and other scientific and technical personnel to process and interpret our genetic tests. In addition, we may need to continue to expand our sales force with qualified and experienced personnel. Competition in our industry for qualified employees is intense, and we may not be able to attract or retain qualified personnel in the future due to the competition for qualified personnel among life science and technology businesses as well as universities and public

and private research institutions, particularly in the San Francisco Bay Area. In addition, our compensation arrangements, such as our equity award programs, may not always be successful in attracting new employees and retaining and motivating our existing employees. If we are not able to attract and retain the necessary personnel to accomplish our business objectives, we may experience constraints that could adversely affect our ability to scale our business, support our research and development efforts and our clinical laboratory. We believe that our corporate culture fosters innovation, creativity and teamwork. However, as our organization grows, we may find it increasingly difficult to maintain the beneficial aspects of our corporate culture. This could negatively impact our ability to retain and attract employees and our future success.

We need to scale our infrastructure in advance of demand for our tests, and our failure to generate sufficient demand for our tests would have a negative impact on our business and our ability to attain profitability.

Our success depends in large part on our ability to extend our market position, to provide customers with high-quality test reports quickly and at a lower price than our competitors, and to achieve sufficient test volume to realize economies of scale. In order to execute our business model, we intend to continue to invest heavily in order to significantly scale our infrastructure, including our testing capacity and information systems, expand our commercial operations, customer service, billing and systems processes and enhance our internal quality assurance program. We expect that much of this growth will be in advance of demand for our tests. Our current and future expense levels are to a large extent fixed and are largely based on our investment plans and our estimates of future revenue. Because the timing and amount of revenue from our tests is difficult to forecast, when revenue does not meet our expectations, we may not be able to adjust our spending promptly or reduce our spending to levels commensurate with our revenue. Even if we are able to successfully scale our infrastructure and operations, we cannot assure you that demand for our tests will increase at levels consistent with the growth of our infrastructure. If we fail to generate demand commensurate with this growth or if we fail to scale our infrastructure sufficiently in advance of demand to successfully meet such demand, our business, prospects, financial condition and results of operations could be adversely affected.

If we are not able to continue to generate substantial demand of our tests, our commercial success will be negatively affected.

Our business model assumes that we will be able to generate significant test volume, and we may not succeed in continuing to drive adoption of our tests to achieve sufficient volumes. Inasmuch as detailed genetic data from broad-based testing panels such as our tests have only recently become available at relatively affordable prices, the continued pace and degree of clinical acceptance of the utility of such testing is uncertain. Specifically, it is uncertain how much genetic data will be accepted as necessary or useful, as well as how detailed that data should be, particularly since medical practitioners may have become accustomed to genetic testing that is specific to one or a few genes. Given the substantial amount of additional information available from a broad-based testing panel such as ours, there may be distrust as to the reliability of such information when compared with more limited and focused genetic tests. To generate further demand for our tests, we will need to continue to make clinicians aware of the benefits of our tests, including the price, the breadth of our testing options, and the benefits of having additional genetic data available from which to make treatment decisions. Because broad-based testing panels are relatively new, it may be more difficult or take more time for us to expand clinical adoption beyond our current customer base. In addition, clinicians in other areas of medicine may not adopt genetic testing for hereditary disease as readily as it has been adopted in hereditary cancer and our efforts to sell our tests to clinicians outside of oncology may not be successful. A lack of or delay in clinical acceptance of broad-based panels such as our tests would negatively impact sales and market acceptance of our tests and limit our revenue growth and potential profitability. Genetic testing is expensive and many potential customers may be sensitive to pricing. In addition, potential customers may not adopt our tests if adequate reimbursement is not available, or if we are not able to maintain low prices relative to our competitors. Also, we have recently introduced our direct channel, in which we facilitate the ordering of our genetic tests by consumers through an online network of physicians. Since we have limited experience directly marketing to patients, we may not be successful in increasing demand for our tests through this new channel. Patient-initiated testing may also be perceived negatively by our existing customer base of clinicians and genetic counselors, in which case our core business could be harmed.

If we are not able to generate demand for our tests at sufficient volume, or if it takes significantly more time to generate this demand than we anticipate, our business, prospects, financial condition and results of operations could be materially harmed.

Our success will depend on our ability to use rapidly changing genetic data to interpret test results accurately and consistently, and our failure to do so would have an adverse effect on our operating results and business, harm our reputation and could result in substantial liabilities that exceed our resources.

Our success depends on our ability to provide reliable, high-quality tests that incorporate rapidly evolving information about the role of genes and gene variants in disease and clinically relevant outcomes associated with those variants. Errors, such as failure to detect genomic variants with high accuracy, or mistakes, such as failure to identify, or incompletely or incorrectly identifying, gene variants or their significance, could have a significant adverse impact on our business.

Hundreds of genes can be implicated in some disorders, and overlapping networks of genes and symptoms can be implicated in multiple conditions. As a result, a substantial amount of judgment is required in order to interpret testing results for an individual patient and to develop an appropriate patient report. We classify variants in accordance with published guidelines as benign, likely benign, variants of uncertain significance, likely pathogenic or pathogenic, and these guidelines are subject to change. In addition, it is our practice to offer support to clinicians and geneticists ordering our tests regarding which genes or panels to order as well as interpretation of genetic variants. We also rely on clinicians to interpret what we report and to incorporate specific information about an individual patient into the physician's treatment decision.

The marketing, sale and use of our genetic tests could subject us to liability for errors in, misunderstandings of, or inappropriate reliance on, information we provide to clinicians, geneticists or patients, and lead to claims against us if someone were to allege that a test failed to perform as it was designed, if we failed to correctly interpret the test results, if we failed to update the test results due to a reclassification of the variants according to new published guidelines, or if the ordering physician were to misinterpret test results or improperly rely on them when making a clinical decision. In addition, our entry into the reproductive health testing market exposes us to increased liability. A product liability or professional liability claim could result in substantial damages and be costly and time-consuming for us to defend. Although we maintain liability insurance, including for errors and omissions, we cannot assure you that such insurance would fully protect us from the financial impact of defending against these types of claims or any judgments, fines or settlement costs arising out of any such claims. Any liability claim, including an errors and omissions liability claim, brought against us, with or without merit, could increase our insurance rates or prevent us from securing insurance coverage in the future. Additionally, any liability lawsuit could cause injury to our reputation or cause us to suspend sales of our tests. The occurrence of any of these events could have an adverse effect on our reputation and results of operations.

Our industry is subject to rapidly changing technology and new and increasing amounts of scientific data related to genes and genetic variants and their role in disease. Our failure to develop tests to keep pace with these changes could make us obsolete.

In recent years, there have been numerous advances in methods used to analyze very large amounts of genomic information and the role of genetics and gene variants in disease and treatment therapies. Our industry has and will continue to be characterized by rapid technological change, increasingly larger amounts of data, frequent new testing service introductions and evolving industry standards, all of which could make our tests obsolete. Our future success will also depend on our ability to keep pace with the evolving needs of our customers on a timely and cost-effective basis and to pursue new market opportunities that develop as a result of technological and scientific advances. Our tests could become obsolete and our business adversely affected unless we continually update our offerings to reflect new scientific knowledge about genes and genetic variations and their role in diseases and treatment therapies.

Our success will depend in part on our ability to generate sales using our internal sales team and through alternative marketing strategies.

We may not be able to market or sell our current tests and any future tests we may develop or acquire effectively enough to drive demand sufficient to support our planned growth. We currently sell our tests primarily through our internal sales force. Historically, our sales efforts have been focused primarily on hereditary cancer and more recently on reproductive health. Our efforts to sell our tests to clinicians and patients outside of oncology may not be successful, or may be difficult to do successfully without significant additional selling and marketing efforts and expense. In the past, we have increased our sales force each year in order to drive our growth. In addition to the efforts of our sales force, future sales will depend in large part on our ability to develop and substantially expand awareness of our company and our tests through alternative strategies including through education of key opinion leaders, through social media-related and online outreach, education and marketing efforts, and through focused channel partner strategies designed to drive demand for our tests. We also plan to continue to spend on consumer advertising in connection with our direct channel to consumers, which could be costly. We have limited experience

implementing these types of marketing efforts. We may not be able to drive sufficient levels of revenue using these sales and marketing methods and strategies necessary to support our planned growth, and our failure to do so could limit our revenue and potential profitability.

Outside the United States we are increasing our direct sales personnel; however, we have limited experience selling and operating internationally. We also use a limited number of distributors to assist internationally with sales, logistics, education and customer support. Sales practices utilized by our distributors that are locally acceptable may not comply with sales practices standards required under U.S. laws that apply to us, which could create additional compliance risk. If our sales and marketing efforts are not successful outside the United States, we may not achieve significant market acceptance for our tests outside the United States, which could adversely impact our business.

Impairment in the value of our goodwill or other intangible assets could have a material adverse effect on our operating results and financial condition.

We record goodwill and intangible assets at fair value upon the acquisition of a business. Goodwill represents the excess of amounts paid for acquiring businesses over the fair value of the net assets acquired. Goodwill and indefinite-lived intangible assets are evaluated for impairment annually, or more frequently if conditions warrant, by comparing the carrying value of a reporting unit to its estimated fair value. Intangible assets with definite lives are reviewed for impairment when events or circumstances indicate that their carrying value may not be recoverable. Declines in operating results, divestitures, sustained market declines and other factors that impact the fair value of a reporting unit could result in an impairment of goodwill or intangible assets and, in turn, a charge to net income. Any such charges could have a material adverse effect on our results of operations or financial condition.

We rely on a limited number of suppliers or, in some cases, sole suppliers, for some of our laboratory instruments, materials and services, and we may not be able to find replacements or immediately transition to alternative suppliers.

We rely on a limited number of suppliers, or, in some cases, sole suppliers, including Illumina, Inc., Integrated DNA Technologies Incorporated, Qiagen N.V., Roche Holdings Ltd. and Twist Bioscience Corporation for certain laboratory substances used in the chemical reactions incorporated into our processes, which we refer to as reagents, as well as sequencers and other equipment and materials which we use in our laboratory operations. We do not have short- or long-term agreements with most of our suppliers, and our suppliers could cease supplying these materials and equipment at any time, or fail to provide us with sufficient quantities of materials or materials that meet our specifications. Our laboratory operations could be interrupted if we encounter delays or difficulties in securing these reagents, sequencers or other equipment or materials, and if we cannot obtain an acceptable substitute. Any such interruption could significantly affect our business, financial condition, results of operations and reputation. We rely on Illumina as the sole supplier of next generation sequencers and associated reagents and as the sole provider of maintenance and repair services for these sequencers. Any disruption in Illumina's operations could impact our supply chain and laboratory operations as well as our ability to conduct our tests, and it could take a substantial amount of time to integrate replacement equipment into our laboratory operations. We also currently rely on a third party to perform non-invasive prenatal screening, or NIPS, testing on our behalf. In the event of any disruption or termination of these services, it may be difficult to find a replacement NIPS offering, which could harm our business, financial condition, results of operation and reputation.

We believe that there are only a few other manufacturers that are currently capable of supplying and servicing the equipment necessary for our laboratory operations, including sequencers and various associated reagents. The use of equipment or materials provided by these replacement suppliers would require us to alter our laboratory operations. Transitioning to a new supplier would be time consuming and expensive, may result in interruptions in our laboratory operations, could affect the performance specifications of our laboratory operations or could require that we revalidate our tests. We cannot assure you that we will be able to secure alternative equipment, reagents and other materials, and bring such equipment, reagents and materials on line and revalidate them without experiencing interruptions in our workflow. In the case of an alternative supplier for Illumina, we cannot assure you that replacement sequencers and associated reagents will be available or will meet our quality control and performance requirements for our laboratory operations. If we encounter delays or difficulties in securing, reconfiguring or revalidating the equipment and reagents we require for our tests, our business, financial condition, results of operations and reputation could be adversely affected.

If our laboratories in California become inoperable due to disasters, health epidemics or for any other reasons, we will be unable to perform our tests and our business will be harmed.

We perform all of our tests at our production facilities in San Francisco and Irvine, California. Our laboratories and the equipment we use to perform our tests would be costly to replace and could require substantial lead time to replace and qualify for use. Our laboratories may be harmed or rendered inoperable by natural or man-made disasters, including earthquakes, flooding, fire and power outages, or by health epidemics, such as the COVID-19 pandemic, which may render it difficult or impossible for us to perform our tests for some period of time. This risk of natural disaster is especially high for us since we perform the substantial majority of our tests at our San Francisco laboratory, which is located in an active seismic region, and we do not have a redundant facility to perform the same tests in the event our San Francisco laboratory is inoperable. The inability to perform our tests or the backlog that could develop if our laboratories are inoperable for even a short period of time may result in the loss of customers or harm our reputation. Although we maintain insurance for damage to our property and the disruption of our business, this insurance may not be sufficient to cover all of our potential losses and may not continue to be available to us on acceptable terms, if at all.

The loss of any member or change in structure of our senior management team could adversely affect our business.

Our success depends in large part upon the skills, experience and performance of members of our executive management team and others in key leadership positions. The efforts of these persons will be critical to us as we continue to develop our technologies and test processes and focus on scaling our business. If we were to lose one or more key executives, we may experience difficulties in competing effectively, developing our technologies and implementing our business strategy. All of our executives and employees are at-will, which means that either we or the executive or employee may terminate their employment at any time. We do not carry key man insurance for any of our executives or employees. In addition, we do not have a long-term retention agreement in place with our president and chief executive officer.

Development of new tests is a complex process, and we may be unable to commercialize new tests on a timely basis, or at all.

We cannot assure you that we will be able to develop and commercialize new tests on a timely basis. Before we can commercialize any new tests, we will need to expend significant funds in order to:

- conduct research and development;
- further develop and scale our laboratory processes; and
- further develop and scale our infrastructure to be able to analyze increasingly larger and more diverse amounts of data.

Our testing service development process involves risk, and development efforts may fail for many reasons, including:

- failure of any test to perform as expected;
- lack of validation or reference data; or
- failure to demonstrate utility of a test.

As we develop tests, we will have to make significant investments in development, marketing and selling resources. In addition, competitors may develop and commercialize competing tests faster than we are able to do so.

We depend on our information technology systems, and any failure of these systems could harm our business.

We depend on information technology and telecommunications systems for significant elements of our operations, including our laboratory information management system, our bioinformatics analytical software systems, our database of information relating to genetic variations and their role in disease process and drug metabolism, our clinical report optimization systems, our customer-facing web-based software, our customer reporting, and our various customer tools and platforms. We have installed, and expect to expand, a number of enterprise software systems that affect a broad range of business processes and functional areas, including for example, systems handling human resources, financial controls and reporting, customer relationship management, regulatory compliance and other infrastructure operations. In addition, we intend to extend the capabilities of both our preventative and detective security controls by augmenting the monitoring and alerting functions, the network

design, and the automatic countermeasure operations of our technical systems. These information technology and telecommunications systems support a variety of functions, including laboratory operations, test validation, sample tracking, quality control, customer service support, billing and reimbursement, research and development activities, scientific and medical curation, and general administrative activities, including financial reporting.

Information technology and telecommunications systems are vulnerable to damage from a variety of sources, including telecommunications or network failures, malicious human acts and natural disasters. Moreover, despite network security and back-up measures, some of our servers are potentially vulnerable to physical or electronic break-ins, computer viruses and similar disruptive problems. Despite the precautionary measures we have taken to prevent unanticipated problems that could affect our information technology and telecommunications systems, failures or significant downtime of our information technology or telecommunications systems or those used by our third-party service providers could prevent us from conducting tests, preparing and providing reports to clinicians, billing payers, processing reimbursement appeals, handling physician or patient inquiries, conducting research and development activities, and managing the administrative and financial aspects of our business. Any disruption or loss of information technology or telecommunications systems on which critical aspects of our operations depend could have an adverse effect on our business and results of operations.

Technical problems have arisen, and may arise in the future, in connection with our data and systems, including those that are hosted by third-party providers, which have in the past and may in the future result in interruptions in our business and operations. These types of problems may be caused by a variety of factors, including infrastructure changes, human or software errors, viruses, security attacks, fraud, spikes in customer usage and denial of service issues. From time to time, large third-party web hosting providers have experienced outages or other problems that have resulted in their systems being offline and inaccessible. Such outages could materially impact our business and operations.

Ethical, legal and social concerns related to the use of genetic information could reduce demand for our tests.

Genetic testing has raised ethical, legal and social issues regarding privacy and the appropriate uses of the resulting information. Governmental authorities could, for social or other purposes, limit or regulate the use of genetic information or genetic testing or prohibit testing for genetic predisposition to certain conditions, particularly for those that have no known cure. Similarly, these concerns may lead patients to refuse to use, or clinicians to be reluctant to order, genomic tests even if permissible. These and other ethical, legal and social concerns may limit market acceptance of our tests or reduce the potential markets for our tests, either of which could have an adverse effect on our business, financial condition or results of operations.

Our international business exposes us to business, regulatory, political, operational, financial and economic risks associated with doing business outside of the United States.

Doing business internationally involves a number of risks, including:

- multiple, conflicting and changing laws and regulations such as privacy regulations, tax laws, export and import restrictions, employment laws, regulatory requirements, and other governmental approvals, permits and licenses;
- failure by us or our distributors to obtain regulatory approvals for the use of our tests in various countries;
- complexities and difficulties in obtaining protection and enforcing our intellectual property;
- difficulties in staffing and managing foreign operations;
- complexities associated with managing multiple payer reimbursement regimes, government payers or patient self-pay systems;
- logistics and regulations associated with shipping samples, including infrastructure conditions, customs and transportation delays;
- limits on our ability to penetrate international markets if we do not to conduct our tests locally;
- natural disasters, including the recent and ongoing outbreak and spreading of Coronavirus, political and economic instability, including wars, terrorism and political unrest, outbreak of disease, boycotts, curtailment of trade and other business restrictions; and
- regulatory and compliance risks that relate to maintaining accurate information and control over activities that may fall within the purview of the U.S. Foreign Corrupt Practices Act, or FCPA, its books and records provisions, or its anti-bribery provisions.

Any of these factors could significantly harm our international operations and, consequently, our revenue and results of operations.

In addition, applicable export or import laws and regulations such as prohibitions on the export of samples imposed by countries outside of the United States, or international privacy or data restrictions that are different or more stringent than those of the United States, may require that we build additional laboratories or engage in joint ventures or other business partnerships in order to offer our tests internationally in the future. Any such restrictions would impair our ability to offer our tests in such countries and could have an adverse effect on our business, financial condition and results of operations.

Our ability to use our net operating loss carryforwards and certain other tax attributes may be limited.

At March 31, 2020, our total gross deferred tax assets were $204.5 million. Due to our lack of earnings history and uncertainties surrounding our ability to generate future taxable income, the net deferred tax assets have been fully offset by a valuation allowance. The deferred tax assets were primarily comprised of federal and state tax net operating losses and tax credit carryforwards. Furthermore, under Section 382 of the Internal Revenue Code of 1986, as amended, or the Internal Revenue Code, if a corporation undergoes an "ownership change," the corporation's ability to use its pre-change net operating loss carryforwards, or NOLs, and other pre-change tax attributes (such as research tax credits) to offset its future taxable income may be limited. In general, an "ownership change" occurs if there is a cumulative change in our ownership by "5% shareholders" that exceeds 50 percentage points over a rolling three-year period. Our existing NOLs and tax credit carryovers may be subject to limitations arising from previous ownership changes, and if we undergo one or more ownership changes in connection with completed acquisitions, or other future transactions in our stock, our ability to utilize NOLs and tax credit carryovers could be further limited by Section 382 of the Internal Revenue Code. As a result, if we earn net taxable income, our ability to use our pre-change net operating loss and tax credit carryforwards to offset U.S. federal taxable income may be subject to limitations, which could potentially result in increased future tax liability to us. The annual limitation may result in the expiration of certain net operating loss and tax credit carryforwards before their utilization. In addition, the Tax Cuts and Jobs Act limits the deduction for NOLs to 80% of current year taxable income and eliminates NOL carrybacks. Also, at the state level, there may be periods during which the use of NOLs is suspended or otherwise limited, which could accelerate or permanently increase state taxes owed.

Risks related to government regulation

If the FDA regulates our tests as medical devices, we could incur substantial costs and our business, financial condition and results of operations could be adversely affected.

We provide our tests as laboratory-developed tests, or LDTs. CMS and certain state agencies regulate the performance of LDTs (as authorized by the Clinical Laboratory Improvement Amendments of 1988, or CLIA, and state law, respectively).

Historically, the FDA has exercised enforcement discretion with respect to most LDTs and has not required laboratories that furnish LDTs to comply with the agency's requirements for medical devices (e.g., establishment registration, device listing, quality systems regulations, premarket clearance or premarket approval, and post-market controls). In recent years, however, the FDA has stated it intends to end its policy of general enforcement discretion and regulate certain LDTs as medical devices. To this end, on October 3, 2014, the FDA issued two draft guidance documents, entitled "Framework for Regulatory Oversight of Laboratory Developed Tests (LDTs)" and "FDA Notification and Medical Device Reporting for Laboratory Developed Tests (LDTs)," respectively, that set forth a proposed risk-based regulatory framework that would apply varying levels of FDA oversight to LDTs. Subsequently, on January 13, 2017, the FDA published a "discussion paper" in which it outlined a substantially revised "possible approach" to the oversight of LDTs. In December 2018, a draft bill titled the "Verifying Accurate Leading-edge IVCT Development Act of 2018," or VALID Act, was released for discussion. The draft bill proposes a risk-based approach to regulate LDTs and creates a new in vitro clinical test, or IVCT, category of regulated products, which includes LDTs, and a regulatory structure under the FDA. As proposed, the draft bill grandfathers many existing tests from the proposed premarket approval, quality systems, and labeling requirements, respectively, but would require such tests to comply with other regulatory requirements (e.g., registration and notification, adverse event reporting). We cannot predict if this draft bill will be enacted in its current (or any other) form and cannot quantify the effect of this draft bill on our business.

In April 2020, we completed our acquisition of Genelex Solutions, LLC, which offers certain pharmacogenetic, or PGx, tests as LDTs. Recently the FDA has taken a more active role in the oversight of PGx tests offered as LDTs. In 2019, the FDA contacted several clinical laboratories, including Genelex, to demand changes to PGx test reports and marketing materials. In February 2020, the FDA issued a statement indicating that it continues to have concerns about the claims that certain clinical laboratories make with respect to their PGx tests,

and published tables that list PGx associations for which FDA has determined that the data support therapeutic management recommendations, a potential impact on safety or response, or a potential impact on pharmacokinetic properties only, respectively. To date, however, the FDA has not provided any general guidance on the type(s) of claims or other characteristics that will cause a PGx test to fall outside FDA's enforcement discretion. As such, the extent to which FDA will allow any laboratory, including Genelex or Invitae, to offer PGx tests in their current form without meeting FDA regulatory requirements for medical devices is unclear at this time.

In March 2020, a bill titled the "Verifying Accurate Leading-edge IVCT Development Act of 2020," or VALID Act, was officially introduced in Congress. The bill proposes a risk-based approach to regulate LDTs and creates a new in vitro clinical test, or IVCT, category of regulated products, which includes LDTs, and a regulatory structure under the FDA. As proposed, the bill grandfathers many existing tests from the proposed premarket approval, quality systems, and labeling requirements, respectively, but would require such tests to comply with other regulatory requirements (e.g., registration and listing, adverse event reporting). Later that month, Senator Paul introduced the Verified Innovative Testing in American Laboratories Act of 2020, or VITAL Act, which proposes that all aspects of "laboratory-developed testing procedures" be subject to regulation under CLIA, and that no aspects of such procedures be subject to regulation by the FDA. We cannot predict if either of these bills will be enacted in their current (or any other) form and cannot quantify the effect of these bills on our business.

Legislative proposals addressing the FDA's oversight of LDTs have been introduced in previous Congresses, and we expect that new legislative proposals may be introduced from time-to-time. The likelihood that Congress will pass such legislation and the extent to which such legislation may affect the FDA's plans to regulate certain LDTs as medical devices is difficult to predict at this time.

If the FDA ultimately regulates certain LDTs (either as medical devices or as part of a new stand-alone regulatory category for IVCTs), whether via individualized enforcement action, or more generally, as outlined in final guidance or final regulation, or as instructed by Congress, our tests may be subject to certain additional regulatory requirements. Complying with the FDA's requirements can be expensive, time-consuming and subject us to significant or unanticipated delays. Insofar as we may be required to obtain premarket clearance or approval to perform or continue performing an LDT, we cannot assure you that we will be able to obtain such authorization. Even if we obtain regulatory clearance or approval where required, such authorization may not be for the intended uses that we believe are commercially attractive or are critical to the commercial success of our tests. As a result, the application of the FDA's requirements to our tests could materially and adversely affect our business, financial condition and results of operations.

Failure to comply with applicable FDA regulatory requirements may trigger a range of enforcement actions by the FDA including warning letters, civil monetary penalties, injunctions, criminal prosecution, recall or seizure, operating restrictions, partial suspension or total shutdown of operations, and denial of or challenges to applications for clearance or approval, as well as significant adverse publicity.

In addition, in November 2013, the FDA issued final guidance regarding the distribution of products labeled for research use only. Certain of the reagents and other products we use in our tests are labeled as research use only products. Certain of our suppliers may cease selling research use only products to us and any failure to obtain an acceptable substitute could significantly and adversely affect our business, financial condition and results of operations.

If we fail to comply with federal, state and foreign laboratory licensing requirements, we could lose the ability to perform our tests or experience disruptions to our business.

We are subject to CLIA, a federal law that regulates clinical laboratories that perform testing on specimens derived from humans for the purpose of providing information for the diagnosis, prevention or treatment of disease. CLIA regulations establish specific standards with respect to personnel qualifications, facility administration, proficiency testing, quality control, quality assurance and inspections. CLIA certification is also required in order for us to be eligible to bill state and federal healthcare programs, as well as many private third-party payers, for our tests. We have current CLIA certifications to conduct our tests at our laboratories in San Francisco and Irvine, California and in Seattle, Washington. To renew these certifications, we are subject to survey and inspection every two years. Moreover, CLIA inspectors may make random inspections of our clinical reference laboratories.

We are also required to maintain licenses to conduct testing in California and Washington. California and Washington laws establish standards for day-to-day operation of our clinical reference laboratories in San Francisco and Irvine, and in Seattle, respectively, which include the training and skills required of personnel and quality control. We also maintain out-of-state laboratory licenses to conduct testing on specimens from Maryland, New York, Pennsylvania and Rhode Island, and with respect to our laboratory in Washington, on specimens from California.

In addition to having laboratory licenses in New York, our clinical reference laboratories are approved on test-specific bases by the New York State Department of Health, or NYDOH. Other states may adopt similar licensure requirements in the future, which may require us to modify, delay or stop our operations in such jurisdictions. We may also be subject to regulation in foreign jurisdictions as we seek to expand international utilization of our tests or such jurisdictions adopt new licensure requirements, which may require review of our tests in order to offer them or may have other limitations such as restrictions on the transport of samples necessary for us to perform our tests that may limit our ability to make our tests available outside of the United States. Complying with licensure requirements in new jurisdictions may be expensive, time-consuming, and subject us to significant and unanticipated delays.

Failure to comply with applicable clinical laboratory licensure requirements may result in a range of enforcement actions, including license suspension, limitation, or revocation, directed plan of action, onsite monitoring, civil monetary penalties, criminal sanctions, and cancellation of the laboratory's approval to receive Medicare and Medicaid payment for its services, as well as significant adverse publicity. Any sanction imposed under CLIA, its implementing regulations, or state or foreign laws or regulations governing clinical laboratory licensure, or our failure to renew our CLIA certificate, a state or foreign license, or accreditation, could have a material adverse effect on our business, financial condition and results of operations. Even if we were able to bring our laboratory back into compliance, we could incur significant expenses and potentially lose revenue in doing so.

The College of American Pathologists, or CAP, maintains a clinical laboratory accreditation program. CAP asserts that its program is "designed to go well beyond regulatory compliance" and helps laboratories achieve the highest standards of excellence to positively impact patient care. While not required to operate a CLIA-certified laboratory, many private insurers require CAP accreditation as a condition to contracting with clinical laboratories to cover their tests. In addition, some countries outside the United States require CAP accreditation as a condition to permitting clinical laboratories to test samples taken from their citizens. We have CAP accreditations for our laboratories. Failure to maintain CAP accreditation could have a material adverse effect on the sales of our tests and the results of our operations.

Complying with numerous statutes and regulations pertaining to our business is an expensive and time-consuming process, and any failure to comply could result in substantial penalties.

Our operations are subject to other extensive federal, state, local and foreign laws and regulations, all of which are subject to change. These laws and regulations currently include, among others:

- HIPAA, which establishes comprehensive federal standards with respect to the privacy and security of protected health information and requirements for the use of certain standardized electronic transactions;
- amendments to HIPAA under HITECH, which strengthen and expand HIPAA privacy and security compliance requirements, increase penalties for violators and expand vicarious liability, extend enforcement authority to state attorneys general, and impose requirements for breach notification;
- the federal Anti-Kickback Statute, which prohibits knowingly and willfully offering, paying, soliciting or receiving remuneration, directly or indirectly, overtly or covertly, in cash or in kind, to induce or in return for the referral of an individual, for the furnishing of or arrangement for the furnishing of any item or service for which payment may be made in whole or in part by a federal healthcare program, or the purchasing, leasing, ordering, arranging for, or recommend purchasing, leasing or ordering, any good, facility, item or service for which payment may be made, in whole or in part, under a federal healthcare program;
- EKRA, which prohibits payments for referrals to recovery homes, clinical treatment facilities, and laboratories and reaches beyond federal health care programs, to include private insurance;
- the federal physician self-referral law, known as the Stark Law, which prohibits a physician from making a referral to an entity for certain designated health services covered by the Medicare program, including laboratory and pathology services, if the physician or an immediate family member has a financial relationship with the entity unless an exception applies, and prohibits an entity from billing for designated health services furnished pursuant to a prohibited referral;
- the federal false claims law, which imposes liability on any person or entity that, among other things, knowingly presents, or causes to be presented, a false or fraudulent claim for payment to the federal government;
- the federal Civil Monetary Penalties Law, which prohibits, among other things, the offering or transfer of remuneration to a Medicare or state healthcare program beneficiary if the person knows or should know it

is likely to influence the beneficiary's selection of a particular provider, practitioner or supplier of services reimbursable by Medicare or a state healthcare program, unless an exception applies;

- the HIPAA fraud and abuse provisions, which create new federal criminal statutes that prohibit, among other things, defrauding health care benefit programs, willfully obstructing a criminal investigation of a healthcare offense and falsifying or concealing a material fact or making any materially false statements in connection with the payment for healthcare benefits, items or services;
- other federal and state fraud and abuse laws, such as anti-kickback laws, prohibitions on self-referral, fee-splitting restrictions, insurance fraud laws, anti-markup laws, prohibitions on the provision of tests at no or discounted cost to induce physician or patient adoption, and false claims acts, which may extend to services reimbursable by any third-party payer, including private insurers;
- the prohibition on reassignment of Medicare claims, which, subject to certain exceptions, precludes the reassignment of Medicare claims to any other party;
- state laws that prohibit other specified practices, such as billing clinicians for testing that they order; waiving coinsurance, copayments, deductibles and other amounts owed by patients; billing a state Medicaid program at a price that is higher than what is charged to one or more other payers; and
- similar foreign laws and regulations that apply to us in the countries in which we operate or may operate in the future.

We have adopted policies and procedures designed to comply with these laws and regulations. In the ordinary course of our business, we conduct internal reviews of our compliance with these laws. Our compliance may also be subject to governmental review. The growth of our business and our expansion outside of the United States may increase the potential of violating these laws or our internal policies and procedures. The risk of our being found in violation of these or other laws and regulations is further increased by the fact that many have not been fully interpreted by the regulatory authorities or the courts, and their provisions are open to a variety of interpretations. Any action brought against us for violation of these or other laws or regulations, even if we successfully defend against it, could cause us to incur significant legal expenses and divert our management's attention from the operation of our business. If our operations are found to be in violation of any of these laws and regulations, we may be subject to any applicable penalty associated with the violation, including administrative, civil and criminal penalties, damages, fines, individual imprisonment, exclusion from participation in Federal healthcare programs, refunding of payments received by us, and curtailment or cessation of our operations. Any of the foregoing consequences could seriously harm our business and our financial results.

Healthcare policy changes, including legislation reforming the U.S. healthcare system, may have a material adverse effect on our financial condition, results of operations and cash flows.

In March 2010, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act, collectively referred to as the Affordable Care Act, was enacted in the United States, which made a number of substantial changes in the way healthcare is financed by both governmental and private insurers. Policy changes or implementation of new health care legislation could result in significant changes to health care systems. In the United States, this could include potential modification or repeal of all or parts of the Affordable Care Act.

In April 2014, Congress passed the Protecting Access to Medicare Act of 2014, or PAMA, which included substantial changes to the way in which clinical laboratory services are paid under Medicare. Under PAMA (as amended by the Further Consolidated Appropriations Act, 2020 and the Coronavirus Aid, Relief, and Economic Security Act, respectively) and its implementing regulations, clinical laboratories must report to CMS private payer rates beginning in 2017, and then in 2022 and every three years thereafter for clinical diagnostic laboratory tests that are not advanced diagnostic laboratory tests and every year for advanced diagnostic laboratory tests.

We do not believe that our tests meet the definition of advanced diagnostic laboratory tests, but in the event that we seek designation for one or more of our tests as an advanced diagnostic laboratory test and the tests are determined by CMS to meet these criteria or new criteria developed by CMS, we would be required to report private payer data for those tests annually. Otherwise, we will be required to report private payer rates for our tests on an every three years basis starting in 2022. Laboratories that fail to timely report the required payment information may be subject to substantial civil money penalties.

As set forth in the PAMA final rule, for tests furnished on or after January 1, 2018, Medicare payments for clinical diagnostic laboratory tests are paid based upon these reported private payer rates. For clinical diagnostic laboratory tests that are assigned a new or substantially revised code, initial payment rates for clinical diagnostic

laboratory tests that are not advanced diagnostic laboratory tests will be assigned by the cross-walk or gap-fill methodology. Initial payment rates for new advanced diagnostic laboratory tests will be based on the actual list charge for the laboratory test. The payment rates calculated under PAMA went into effect starting January 1, 2018. Where applicable, reductions to payment rates resulting from the new methodology are limited to 10% per test per year in each of the years 2018 through 2020. Rates will be held at 2020 levels during 2021, and then, where applicable based upon median private payer rates reported in 2017 or 2022, reduced by up to 15% per test per year in each of 2022 through 2024 (with a second round of private payer rate reporting in 2022 to establish rates for 2023 through 2025).

PAMA also authorized the adoption of new, temporary billing codes and/or unique test identifiers for FDA-cleared or approved tests as well as advanced diagnostic laboratory tests. The CPT® Editorial Panel approved a proposal to create a new section of billing codes to facilitate implementation of this section of PAMA, but these codes would apply to our tests only if we apply for such codes.

In March 2018, CMS published a national coverage determination, or NCD, for next generation sequencing, or NGS tests for somatic (acquired) cancer testing. CMS subsequently updated this NCD in January 2020 to address coverage for NGS tests for germline (inherited) cancer testing and to clarify certain aspects of Medicare's coverage of NGS for somatic cancer testing. For somatic cancer testing, the updated NCD establishes full coverage for FDA-approved or FDA-cleared NGS-based companion diagnostic assays that report results using report templates that specify treatment options when offered for their FDA-approved or FDA-cleared use(s), ordered by the patient's treating physician for Medicare beneficiaries with advanced cancer (recurrent, relapsed, refractory, metastatic, or advanced stage III or IV cancer) who have not have previously been tested with the same test using NGS for the same cancer genetic content, and have decided to seek further cancer treatment. The NCD also gives MACs the authority to establish local coverage for NGS-based somatic cancer assays that are not FDA-approved or FDA-cleared companion diagnostics when offered to patients meeting the above-referenced criteria. It appears that NGS-based somatic cancer tests provided for patients with cancer that do not meet the above-referenced criteria - e.g., patients with earlier stage cancers - are nationally non-covered under the NCD.

Effective January 27, 2020, the NCD also established full coverage for FDA-approved or FDA-cleared NGS-based germline tests that report results using report templates that specify treatment options when ordered by the patient's treating physician for patients with ovarian or breast cancer, a clinical indication for germline testing for hereditary breast or ovarian cancer, and a risk factor for germline breast or ovarian cancer, provided the patient has not previously been tested with the same germline test using NGS for the same germline genetic content. The NCD also gives MACs the authority to establish local coverage for NGS-based germline tests for ovarian or breast cancer that are not FDA-approved or FDA-cleared, as well as for NGS-based tests for any other cancer diagnosis (regardless of the test's FDA regulatory status) when offered to patients meeting the above-referenced criteria for germline testing. Since we already have local coverage for our germline tests for ovarian and breast cancer, we believe that the NCD will not have a material impact on which of our tests will be reimbursable by CMS for Medicare patients.

We cannot predict whether future healthcare initiatives will be implemented at the federal or state level, or how any future legislation or regulation may affect us. For instance, the payment reductions imposed by the Affordable Care Act and the expansion of the federal and state governments' role in the U.S. healthcare industry as well as changes to the reimbursement amounts paid by payers for our tests and future tests or our medical procedure volumes may reduce our profits and have a materially adverse effect on our business, financial condition, results of operations and cash flows. Notably, Congress enacted legislation in 2017 that eliminated the Affordable Care Act's "individual mandate" beginning in 2019, which may significantly impact the number of covered lives participating in exchange plans. Moreover, Congress has proposed on several occasions to impose a 20% coinsurance on patients for clinical laboratory tests reimbursed under the clinical laboratory fee schedule, which would increase our billing and collecting costs and decrease our revenue.

If we use hazardous materials in a manner that causes injury, we could be liable for resulting damages.

Our activities currently require the use of hazardous chemicals and biological material. We cannot eliminate the risk of accidental contamination or injury to employees or third parties from the use, storage, handling or disposal of these materials. In the event of contamination or injury, we could be held liable for any resulting damages, and any liability could exceed our resources or any applicable insurance coverage we may have. In 2018, we decommissioned our laboratory in Cambridge, Massachusetts; however, we could be held liable for any damages resulting from our prior use of hazardous chemicals and biological materials at this facility. Additionally, we are subject on an ongoing basis to federal, state and local laws and regulations governing the use, storage, handling and disposal of these materials and specified waste products. The cost of compliance with these laws and

regulations may become significant, and our failure to comply may result in substantial fines or other consequences, and either could negatively affect our operating results.

We could be adversely affected by violations of the FCPA and other worldwide anti-bribery laws.

We are subject to the FCPA, which prohibits companies and their intermediaries from making payments in violation of law to non-U.S. government officials for the purpose of obtaining or retaining business or securing any other improper advantage. We are increasing our direct sales and operations personnel outside the United States, in which we have limited experience. We use a limited number of independent distributors to sell our tests internationally, which requires a high degree of vigilance in maintaining our policy against participation in corrupt activity, because these distributors could be deemed to be our agents, and we could be held responsible for their actions. Other U.S. companies in the medical device and pharmaceutical fields have faced criminal penalties under the FCPA for allowing their agents to deviate from appropriate practices in doing business with these individuals. We are also subject to similar anti-bribery laws in the jurisdictions in which we operate, including the United Kingdom's Bribery Act of 2010, which also prohibits commercial bribery and makes it a crime for companies to fail to prevent bribery. These laws are complex and far-reaching in nature, and, as a result, we cannot assure you that we would not be required in the future to alter one or more of our practices to be in compliance with these laws or any changes in these laws or the interpretation thereof. Any violations of these laws, or allegations of such violations, could disrupt our operations, involve significant management distraction, involve significant costs and expenses, including legal fees, and could result in a material adverse effect on our business, prospects, financial condition or results of operations. We could also incur severe penalties, including criminal and civil penalties, disgorgement and other remedial measures.

Risks related to our intellectual property

Litigation or other proceedings or third-party claims of intellectual property infringement or misappropriation may require us to spend significant time and money, and could in the future prevent us from selling our tests or impact our stock price.

Our commercial success will depend in part on our avoiding infringement of patents and proprietary rights of third parties, including for example the intellectual property rights of competitors. As we continue to commercialize our tests in their current or an updated form, launch different and expanded tests, and enter new markets, competitors might claim that our tests infringe or misappropriate their intellectual property rights as part of business strategies designed to impede our successful commercialization and entry into new markets. Our activities may be subject to claims that we infringe or otherwise violate patents or other intellectual property rights owned or controlled by third parties. We cannot assure you that our operations do not, or will not in the future, infringe existing or future patents. We may be unaware of patents that a third party, including for example a competitor in the genetic testing market, might assert are infringed by our business. There may also be patent applications that, if issued as patents, could be asserted against us. Third parties making claims against us for infringement or misappropriation of their intellectual property rights may seek and obtain injunctive or other equitable relief, which could effectively block our ability to perform our tests. Further, if a patent infringement suit were brought against us, we could be forced to stop or delay our development or sales of any tests or other activities that are the subject of such suit. Defense of these claims, regardless of merit, could cause us to incur substantial expenses and be a substantial diversion of our employee resources. Any adverse ruling or perception of an adverse ruling in defending ourselves could have a material adverse impact on our business and stock price. In the event of a successful claim of infringement against us by a third party, we may have to (1) pay substantial damages, possibly including treble damages and attorneys' fees if we are found to have willfully infringed patents; (2) obtain one or more licenses, which may not be available on commercially reasonable terms (if at all); (3) pay royalties; and/or (4) redesign any infringing tests or other activities, which may be impossible or require substantial time and monetary expenditure, all of which could have a material adverse impact on our cash position and business and financial condition.

If licenses to third-party intellectual property rights are or become required for us to engage in our business, we may be unable to obtain them at a reasonable cost, if at all. Even if such licenses are available, we could incur substantial costs related to royalty payments for licenses obtained from third parties, which could negatively affect our gross margins. Moreover, we could encounter delays in the introduction of tests while we attempt to develop alternatives. Defense of any lawsuit or failure to obtain any of these licenses on favorable terms could prevent us from commercializing tests, which could materially affect our ability to grow and thus adversely affect our business and financial condition.

Developments in patent law could have a negative impact on our business.

Although we view current U.S. Supreme Court precedent to be aligned with our belief that naturally occurring DNA sequences and detection of natural correlations between observed facts (such as patient genetic data) and an

understanding of that fact's implications (such as a patient's risk of disease associated with certain genetic variations) should not be patentable, it is possible that subsequent determinations by the U.S. Supreme Court or other federal courts could limit, alter or potentially overrule current law. Moreover, from time to time the U.S. Supreme Court, other federal courts, the United States Congress or the U.S. Patent and Trademark Office, or USPTO, may change the standards of patentability, and any such changes could run contrary to, or otherwise be inconsistent with, our belief that naturally occurring DNA sequences and detection of natural correlations between observed facts and an understanding of that fact's implications should not be patentable, which could result in third parties newly claiming that our business practices infringe patents drawn from categories of patents which we currently view to be invalid as directed to unpatentable subject matter. For example, the U.S. Senate Judiciary Committee, Subcommittee on Intellectual Property held hearings in 2019 regarding a legislative proposal that would overrule current U.S. Supreme Court precedent concerning the scope of patentable subject matter. Our President and Chief Executive Officer, Sean George, appeared before this subcommittee. If such proposal were to be formulated as a bill and enacted into law, there could be an increase in third-party claims to patent rights over correlations between patient genetic data and its interpretation and such third parties may assert that our business practices infringe some of those resulting patent rights.

Our inability to effectively protect our proprietary technologies, including the confidentiality of our trade secrets, could harm our competitive position.

We currently rely upon trade secret protection and copyright, as well as non-disclosure agreements and invention assignment agreements with our employees, consultants and third parties, and to a limited extent patent protection, to protect our confidential and proprietary information. Although our competitors have utilized and are expected to continue utilizing similar methods and have aggregated and are expected to continue to aggregate similar databases of genetic testing information, our success will depend upon our ability to develop proprietary methods and databases and to defend any advantages afforded to us by such methods and databases relative to our competitors. If we do not protect our intellectual property adequately, competitors may be able to use our methods and databases and thereby erode any competitive advantages we may have.

We will be able to protect our proprietary rights from unauthorized use by third parties only to the extent that our proprietary technologies are covered by valid and enforceable patents or are effectively maintained as trade secrets. In this regard, we have applied, and we intend to continue applying, for patents covering such aspects of our technologies as we deem appropriate. However, we expect that potential patent coverage we may obtain will not be sufficient to prevent substantial competition. In this regard, we believe it is probable that others will independently develop similar or alternative technologies or design around those technologies for which we may obtain patent protection. In addition, any patent applications we file may be challenged and may not result in issued patents or may be invalidated or narrowed in scope after they are issued. Questions as to inventorship or ownership may also arise. Any finding that our patents or applications are unenforceable could harm our ability to prevent others from practicing the related technology, and a finding that others have inventorship or ownership rights to our patents and applications could require us to obtain certain rights to practice related technologies, which may not be available on favorable terms, if at all. If we initiate lawsuits to protect or enforce our patents, or litigate against third-party claims, which would be expensive, and, if we lose, we may lose some of our intellectual property rights. Furthermore, these lawsuits may divert the attention of our management and technical personnel.

We expect to rely primarily upon trade secrets and proprietary know-how protection for our confidential and proprietary information, and we have taken security measures to protect this information. These measures, however, may not provide adequate protection for our trade secrets, know-how or other confidential information. Among other things, we seek to protect our trade secrets and confidential information by entering into confidentiality agreements with employees and consultants. There can be no assurance that any confidentiality agreements that we have with our employees and consultants will provide meaningful protection for our trade secrets and confidential information or will provide adequate remedies in the event of unauthorized use or disclosure of such information. Accordingly, there also can be no assurance that our trade secrets will not otherwise become known or be independently developed by competitors. Enforcing a claim that a party illegally disclosed or misappropriated a trade secret can be difficult, expensive and time-consuming, and the outcome is unpredictable. In addition, trade secrets may be independently developed by others in a manner that could prevent legal recourse by us. If any of our confidential or proprietary information, such as our trade secrets, were to be disclosed or misappropriated, or if any such information was independently developed by a competitor, our competitive position could be harmed.

We may not be able to enforce our intellectual property rights throughout the world.

The laws of some foreign countries do not protect proprietary rights to the same extent as the laws of the United States, and many companies have encountered significant challenges in establishing and enforcing their proprietary rights outside of the United States. These challenges can be caused by the absence of rules and

methods for the establishment and enforcement of intellectual property rights outside of the United States. In addition, the legal systems of some countries, particularly developing countries, do not favor the enforcement of patents and other intellectual property protection, especially those relating to healthcare. This could make it difficult for us to stop the infringement of our patents, if obtained, or the misappropriation of our other intellectual property rights. For example, many foreign countries have compulsory licensing laws under which a patent owner must grant licenses to third parties. In addition, many countries limit the enforceability of patents against third parties, including government agencies or government contractors. In these countries, patents may provide limited or no benefit. Patent protection must ultimately be sought on a country-by-country basis, which is an expensive and time-consuming process with uncertain outcomes. Accordingly, we may choose not to seek patent protection in certain countries, and we will not have the benefit of patent protection in such countries. Proceedings to enforce our patent rights in foreign jurisdictions could result in substantial costs and divert our efforts and attention from other aspects of our business. Accordingly, our efforts to protect our intellectual property rights in such countries may be inadequate. In addition, changes in the law and legal decisions by courts in the United States and foreign countries may affect our ability to obtain adequate protection for our technology and the enforcement of intellectual property.

Third parties may assert that our employees or consultants have wrongfully used or disclosed confidential information or misappropriated trade secrets.

We employ individuals who were previously employed at universities or genetic testing, diagnostic or other healthcare companies, including our competitors or potential competitors. Although we try to ensure that our employees and consultants do not use the proprietary information or know-how of others in their work for us, we may be subject to claims that we or our employees or consultants have inadvertently or otherwise used or disclosed intellectual property, including trade secrets or other proprietary information, of a former employer or other third parties. Further, we may be subject to ownership disputes in the future arising, for example, from conflicting obligations of consultants or others who are involved in developing our intellectual property. Litigation may be necessary to defend against these claims. If we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights or personnel. Even if we are successful in defending against such claims, litigation could result in substantial costs and be a distraction to management and other employees.

Risks related to being a public company

We incur increased costs and demands on management as a result of compliance with laws and regulations applicable to public companies, which could harm our operating results.

As a public company, we incur significant legal, accounting and other expenses, including costs associated with public company reporting requirements. In addition, the Sarbanes-Oxley Act of 2002, or the Sarbanes-Oxley Act, as well as rules implemented by the SEC and the New York Stock Exchange, or NYSE, impose a number of requirements on public companies, including with respect to corporate governance practices. The SEC and other regulators have continued to adopt new rules and regulations and make additional changes to existing regulations that require our compliance. In addition, the Dodd-Frank Wall Street Reform and Consumer Protection Act, or the Dodd-Frank Act, enacted in 2010, includes significant corporate governance and executive-compensation-related provisions. Our management and other personnel need to devote a substantial amount of time to these compliance and disclosure obligations. If these requirements divert the attention of our management and personnel from other aspects of our business concerns, they could have a material adverse effect on our business, financial condition and results of operations. Moreover, these rules and regulations applicable to public companies substantially increase our legal, accounting and financial compliance costs, require that we hire additional personnel and make some activities more time consuming and costly. It may also be more expensive for us to obtain director and officer liability insurance.

If we are unable to maintain effective internal control over financial reporting, investors may lose confidence in the accuracy and completeness of our reported financial information and the market price of our common stock may be negatively affected.

We are required to maintain internal control over financial reporting and to report any material weaknesses in such internal controls. Section 404 of the Sarbanes-Oxley Act requires that we evaluate and determine the effectiveness of our internal control over financial reporting and provide a management report on our internal control over financial reporting. If we have a material weakness in our internal control over financial reporting, we may not detect errors on a timely basis and our financial statements may be materially misstated. We have compiled the system and process documentation necessary to perform the evaluation needed to comply with Section 404 of the Sarbanes-Oxley Act. We need to maintain and enhance these processes and controls as we grow and we have required, and may continue to require, additional personnel and resources to do so.

During the evaluation and testing process, if we identify one or more material weaknesses in our internal controls, our management will be unable to conclude that our internal control over financial reporting is effective. Our independent registered public accounting firm is required to issue an attestation report on the effectiveness of our internal control over financial reporting every fiscal year beginning in 2019. Even if our management concludes that our internal control over financial reporting is effective, our independent registered public accounting firm may conclude that there are material weaknesses with respect to our internal controls or the level at which our internal controls are documented, designed, implemented or reviewed.

If we are unable to conclude that our internal control over financial reporting is effective, or if our auditors were to express an adverse opinion on the effectiveness of our internal control over financial reporting because we had one or more material weaknesses, investors could lose confidence in the accuracy and completeness of our financial disclosures, which could cause the price of our common stock to decline. Internal control deficiencies could also result in the restatement of our financial results in the future.

Risks related to our Convertible Senior Notes

Servicing our debt requires a significant amount of cash, and we may not have sufficient cash flow from our business to pay our substantial debt.

In September 2019, we issued $350.0 million aggregate principal amount of our 2.00% Convertible Senior Notes due 2024 in a private placement.

Our ability to make scheduled payments of the principal of, to pay interest on or to refinance our indebtedness, including the notes, depends on our future performance, which is subject to economic, financial, competitive and other factors beyond our control. Our business may not continue to generate cash flow from operations in the future sufficient to service our debt and make necessary capital expenditures. If we are unable to generate such cash flow, we may be required to adopt one or more alternatives, such as selling assets, restructuring debt or obtaining additional equity capital on terms that may be onerous or highly dilutive. Our ability to refinance our indebtedness will depend on the capital markets and our financial condition at such time. We may not be able to engage in any of these activities or engage in these activities on desirable terms, which could result in a default on our debt obligations.

We may not have the ability to raise the funds necessary to settle conversions of the Convertible Senior Notes in cash or to repurchase the notes upon a fundamental change, and our future debt may contain limitations on our ability to pay cash upon conversion or repurchase of the notes.

Holders of the notes have the right to require us to repurchase all or any portion of their notes upon the occurrence of a fundamental change at a fundamental change repurchase price equal to 100% of the principal amount of the notes to be repurchased, *plus* accrued and unpaid interest, if any. In addition, upon conversion of the notes, unless we elect to deliver solely shares of our common stock to settle such conversion (other than paying cash in lieu of delivering any fractional share), we will be required to make cash payments in respect of the notes being converted. However, we may not have enough available cash or be able to obtain financing at the time we are required to make repurchases of notes surrendered therefor or notes being converted. In addition, our ability to repurchase the notes or to pay cash upon conversions of the notes may be limited by law, by regulatory authority or by agreements governing our future indebtedness. Our failure to repurchase notes at a time when the repurchase is required by the indenture or to pay any cash payable on future conversions of the notes as required by the indenture would constitute a default under the indenture. A default under the indenture or the occurrence of the fundamental change itself could also lead to a default under agreements governing our future indebtedness. If the repayment of the related indebtedness were to be accelerated after any applicable notice or grace periods, we may not have sufficient funds to repay the indebtedness and repurchase the notes or make cash payments upon conversions thereof.

The conditional conversion feature of the Convertible Senior Notes, if triggered, may adversely affect our financial condition and operating results.

In the event the conditional conversion feature of the notes is triggered, holders of notes will be entitled to convert the notes at any time during specified periods at their option. If one or more holders elect to convert their notes, unless we elect to satisfy our conversion obligation by delivering solely shares of our common stock (other than paying cash in lieu of delivering any fractional share), we would be required to settle a portion or all of our conversion obligation through the payment of cash, which could adversely affect our liquidity. In addition, even if holders do not elect to convert their notes, we could be required under applicable accounting rules to reclassify all or a portion of the outstanding principal of the notes as a current rather than long-term liability, which would result in a material reduction of our net working capital.

The accounting method for convertible debt securities that may be settled in cash, such as the notes, could have a material effect on our reported financial results.

In May 2008, the Financial Accounting Standards Board, or FASB, issued FASB Staff Position No. APB 14-1, *Accounting for Convertible Debt Instruments That May Be Settled in Cash Upon Conversion (Including Partial Cash Settlement)*, which has subsequently been codified as Accounting Standards Codification 470-20, *Debt with Conversion and Other Options*, or ASC 470-20. Under ASC 470-20, an entity must separately account for the liability and equity components of the convertible debt instruments (such as the notes) that may be settled entirely or partially in cash upon conversion in a manner that reflects the issuer's economic interest cost. The effect of ASC 470-20 on the accounting for the notes is that the equity component is required to be included in the additional paid-in capital section of stockholders' equity on our consolidated balance sheet at issuance, and the value of the equity component would be treated as original issue discount for purposes of accounting for the debt component of the notes. As a result, we will be required to record a greater amount of non-cash interest expense in current periods presented as a result of the amortization of the discounted carrying value of the notes to their face amount over the term of the notes. We will report larger net losses or lower net income in our financial results because ASC 470-20 will require interest to include both the current period's amortization of the debt discount and the instrument's non-convertible coupon interest rate, which could adversely affect our reported or future financial results, the trading price of our common stock and the trading price of the notes.

In addition, under certain circumstances, convertible debt instruments (such as the notes) that may be settled entirely or partly in cash are currently accounted for utilizing the treasury stock method, the effect of which is that the shares issuable upon conversion of the notes are not included in the calculation of diluted net income (loss) per share except to the extent that the conversion value of the notes exceeds their principal amount. Under the treasury stock method, for diluted earnings per share purposes, the transaction is accounted for as if the number of shares of common stock that would be necessary to settle such excess, if we elected to settle such excess in shares, are issued. We cannot be sure that the accounting standards in the future will continue to permit the use of the treasury stock method. If we are unable or otherwise elect not to use the treasury stock method in accounting for the shares issuable upon conversion of the notes, then our diluted earnings per share would be adversely affected. For example, the FASB recently published an exposure draft proposing to amend these accounting standards to eliminate the treasury stock method for convertible instruments and instead require application of the ''if-converted'' method. Under that method, if it is adopted, diluted net income (loss) per share would generally be calculated assuming that all the notes were converted solely into shares of common stock at the beginning of the reporting period, unless the result would be anti-dilutive. The application of the ''if-converted'' method may reduce our reported diluted net income (or further increase our diluted net loss, as the case may be) per share.

Risks related to our common stock

Our stock price is volatile, and you may not be able to sell shares of our common stock at or above the price you paid.

The trading price of our common stock is volatile and could be subject to wide fluctuations in response to various factors, some of which are beyond our control. These factors include:

- actual or anticipated fluctuations in our operating results;
- competition from existing tests or new tests that may emerge;
- announcements by us or our competitors of significant acquisitions, strategic partnerships, joint ventures, collaborations or capital commitments;
- failure to meet or exceed financial estimates and projections of the investment community or that we provide to the public;
- issuance of new or updated research or reports by securities analysts or changed recommendations for our stock;
- our focus on long-term goals over short-term results;
- the timing and magnitude of our investments in the growth of our business;
- actual or anticipated changes in regulatory oversight of our business;
- additions or departures of key management or other personnel;
- disputes or other developments related to our intellectual property or other proprietary rights, including litigation;

- changes in reimbursement by current or potential payers;
- general economic and market conditions; and
- issuances of significant amounts of our common stock.

In addition, the stock market in general, and the market for stock of life sciences companies in particular, has experienced extreme price and volume fluctuations that have often been unrelated or disproportionate to the operating performance of those companies. Broad market and industry factors may seriously affect the market price of our common stock, regardless of our actual operating performance. In addition, in the past, following periods of volatility in the overall market and the market price of a particular company's securities, securities class action litigation has often been instituted against these companies. This litigation, if instituted against us, could result in substantial costs and a diversion of our management's attention and resources.

Sales of a substantial number of shares of our common stock in the public market could cause our stock price to fall.

Sales of a substantial number of shares of our common stock in the public market or the perception that these sales might occur could depress the market price of our common stock and could impair our ability to raise capital through the sale of additional equity securities. We are unable to predict the effect that sales may have on the prevailing market price of our common stock. In addition, the sale of substantial amounts of our common stock could adversely impact its price. As of March 31, 2020, we had outstanding approximately 101.9 million shares of our common stock, options to purchase approximately 3.4 million shares of our common stock (of which approximately 3.0 million were exercisable as of that date), outstanding restricted stock units representing approximately 9.5 million shares of our common stock (which includes an estimated number of Time-based RSUs and PRSUs granted in connection with our acquisition of Singular Bio), outstanding Series A convertible preferred stock convertible into approximately 0.1 million shares of our common stock and warrants to purchase 0.4 million shares of our common stock. The foregoing does not include additional shares that may be issuable in connection with indemnification hold backs related to our acquisitions, consideration of 2.3 million shares for our acquisition of YouScript in April 2020, consideration of 0.9 million shares for our acquisition of Genelex in April 2020, additional shares that may be issuable upon the achievement of certain milestones in connection with our acquisitions of Jungla and Genelex, inducement awards to be granted in connection with our acquisition of Diploid, or shares that may be issuable in the future in connection with the Convertible Senior Notes. In addition, up to $93.7 million of our common stock was available for sale as of March 31, 2020 pursuant to our at the market sales agreement and in April 2020, we closed an underwritten public offering of 20.4 million shares our common stock. The sale or the availability for sale of a large number of shares of our common stock in the public market could cause the price of our common stock to decline.

If securities or industry analysts issue an adverse opinion regarding our stock or do not publish research or reports about our company, our stock price and trading volume could decline.

The trading market for our common stock will depend in part on the research and reports that equity research analysts publish about us and our business. We do not control these analysts or the content and opinions included in their reports. Securities analysts may elect not to provide research coverage of our company and such lack of research coverage may adversely affect the market price of our common stock. The price of our common stock could also decline if one or more equity research analysts downgrade our common stock, change their price targets, issue other unfavorable commentary or cease publishing reports about us or our business. If one or more equity research analysts cease coverage of our company, we could lose visibility in the market, which in turn could cause our stock price to decline.

We have never paid dividends on our capital stock, and we do not anticipate paying dividends in the foreseeable future.

We have never paid dividends on any of our capital stock and currently intend to retain any future earnings to fund the growth of our business. Any determination to pay dividends in the future will be at the discretion of our board of directors and will depend on our financial condition, operating results, capital requirements, general business conditions and other factors that our board of directors may deem relevant. As a result, capital appreciation, if any, of our common stock will be the sole source of gain for the foreseeable future.

Anti-takeover provisions in our charter documents and under Delaware law could discourage, delay or prevent a change in control and may affect the trading price of our common stock.

Provisions in our restated certificate of incorporation and our amended and restated bylaws may have the effect of delaying or preventing a change of control or changes in our management. Our restated certificate of incorporation and amended and restated bylaws include provisions that:

- authorize our board of directors to issue, without further action by the stockholders, up to 20,000,000 shares of undesignated preferred stock;
- require that any action to be taken by our stockholders be effected at a duly called annual or special meeting and not by written consent;
- specify that special meetings of our stockholders can be called only by our board of directors, our chairman of the board or our chief executive officer;
- establish an advance notice procedure for stockholder approvals to be brought before an annual meeting of our stockholders, including proposed nominations of persons for election to our board of directors;
- establish that our board of directors is divided into three classes, Class I, Class II and Class III, with each class serving staggered terms;
- provide that our directors may be removed only for cause;
- provide that vacancies on our board of directors may, except as otherwise required by law, be filled only by a majority of directors then in office, even if less than a quorum; and
- require a super-majority of votes to amend certain of the above-mentioned provisions as well as to amend our bylaws generally.

In addition, we are subject to the provisions of Section 203 of the Delaware General Corporation Law regulating corporate takeovers. Section 203 generally prohibits us from engaging in a business combination with an interested stockholder subject to certain exceptions.

Our certificate of incorporation designates the Court of Chancery of the State of Delaware as the sole and exclusive forum for certain types of actions and proceedings that may be initiated by our stockholders, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers or other employees.

Our certificate of incorporation provides that, unless we consent in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware shall be the sole and exclusive forum for:

- any derivative action or proceeding brought on our behalf;
- any action asserting a claim of breach of a fiduciary duty owed by any of our directors, officers, or other employees to us or our stockholders;
- any action asserting a claim arising pursuant to any provision of the Delaware General Corporation Law; or
- any action asserting a claim against us governed by the internal affairs doctrine.

Any person or entity purchasing or otherwise acquiring any interest in shares of our capital stock shall be deemed to have notice of and consented to the provisions of our certificate of incorporation described above. This choice of forum provision may limit a stockholder's ability to bring a claim in a judicial forum that it finds favorable for disputes with us or our directors, officers or other employees, which may discourage such lawsuits against us and our directors, officers and other employees. Alternatively, if a court were to find these provisions of our certificate of incorporation inapplicable to, or unenforceable in respect of, one or more of the specified types of actions or proceedings, we may incur additional costs associated with resolving such matters in other jurisdictions, which could adversely affect our business, financial condition or results of operations.

ITEM 2. Unregistered Sales of Equity Securities and Use of Proceeds.

During the three months ended March 31, 2020, we issued an aggregate of 2,378,307 shares of our common stock upon the closing of the acquisition of Diploid. This issuance was in reliance upon the exemption from registration provided by Section 4(a)(2) of the Securities Act of 1933.

ITEM 6. Exhibits.

Exhibit Number	Description
2.1+^	Share Purchase Agreement, dated as of March 10, 2020, by and among Invitae Corporation, Invitae Netherlands, B.V. and Peter Schols.
4.1	Registration Rights Agreement by and between the Registrant and Peter Schols.
10.1	Invitae Corporation 2015 Stock Incentive Plan, as amended and restated as of March 6, 2020.
31.1	Principal Executive Officer's Certifications Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.2	Principal Financial and Accounting Officer's Certifications Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
32.1*	Certification Pursuant to 18 U.S.C. § 1350 (Section 906 of Sarbanes-Oxley Act of 2002).
32.2*	Certification Pursuant to 18 U.S.C. § 1350 (Section 906 of Sarbanes-Oxley Act of 2002).
101.INS	Inline XBRL Instance Document - the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document.
101.SCH	Inline XBRL Taxonomy Extension Schema
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase
104	Cover Page Interactive Data File (the cover page XBRL tags are embedded within the Inline XBRL document).

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

^ Portions of this Exhibit have been redacted in accordance with Item 601 of Regulation S-K.

* In accordance with Item 601(b)(32)(ii) of Regulation S-K and SEC Release No. 34-47986, the certifications furnished in Exhibits 32.1 and 32.2 hereto are deemed to accompany this Form 10-Q and will not be deemed "filed" for purposes of Section 18 of the Securities Exchange Act of 1934 (the "Exchange Act") or deemed to be incorporated by reference into any filing under the Exchange Act or the Securities Act of 1933 except to the extent that the registrant specifically incorporates it by reference.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) 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.

INVITAE CORPORATION

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

Sean E. George, Ph.D.
President and Chief Executive Officer
Principal Executive Officer

By: /s/ Shelly D. Guyer

Shelly D. Guyer
Chief Financial Officer
Principal Financial and Accounting Officer

Date: May 8, 2020

Exhibit 2.1

EXECUTION VERSION

[*] Indicates that certain information in this exhibit has been excluded because it is both (i) not material and (ii) would be competitively harmful if publicly disclosed.

SHARE PURCHASE AGREEMENT

between

INVITAE NETHERLANDS, B.V. AS BUYER,

INVITAE CORPORATION AS THE BUYER'S GUARANTOR,

and

PETER SCHOLS AS THE SELLER

concerning the sale and purchase

of all shares of capital stock of

ORBICULE BV D/B/A DIPLOID

March 10, 2020

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EXHIBITS AND SCHEDULES

Exhibit A – Form of Buyer RSU Award Agreement
Exhibit B – Registration Rights Agreement

SHARE PURCHASE AGREEMENT

THIS SHARE PURCHASE AGREEMENT (this "Agreement") is entered into and dated as of March 10, 2020 (the "Agreement Date") by and between Invitae Netherlands, B.V., an Amsterdam limited liability company ("Buyer"), Peter Schols, an individual ("Seller") and Invitae Corporation, a Delaware corporation ("Buyer's Guarantor"). Each of Buyer, Seller and Buyer's Guarantor may be individually referred to herein as a "Party" and collectively referred to herein as the "Parties." Capitalized terms used herein have the meanings ascribed thereto in Article I or elsewhere in this Agreement as identified in Article I.

RECITALS

WHEREAS, as of the Agreement Date, Seller owns all of the shares (the "Shares") of capital stock ("Company Capital Stock") of Orbicule BV, a Belgian limited liability company operating under the name "Diploid", with its registered office at Middelweg 129, 3001 Leuven, Belgium, and company number 0878.549.091 (the "Company");

WHEREAS, pursuant to the terms and conditions of this Agreement, on the Closing Date, Buyer is purchasing from Seller and Seller is selling to Buyer all of the Shares representing 100% of the issued Company Capital Stock (such purchase and sale, the "Share Purchase");

WHEREAS, following consummation of the Share Purchase, Buyer's Guarantor intends to grant certain restricted stock units to the Continuing Employees pursuant to a restricted stock unit award agreement with each such Continuing Employee substantially in the form attached as Exhibit A hereto (as the same may require modification to comply with applicable Law while preserving the intent of such form, a "Buyer RSU Award Agreement"), pursuant to which Buyer's Guarantor, on behalf of Buyer, shall agree to issue shares of Buyer's Guarantor's Common Stock to the Continuing Employees at such times, and upon such conditions (including with respect to the vesting of such shares upon the occurrence of certain time-based contingencies), as are set forth therein; and

WHEREAS, Buyer is the wholly owned subsidiary of Buyer's Guarantor and Buyer's Guarantor is willing to guarantee the obligations of Buyer under this Agreement.

NOW, THEREFORE, in consideration of the foregoing and the mutual agreements and covenants set forth below, and intending to be legally bound hereby, the Parties hereby agree as follows:

Article I

CERTAIN DEFINITIONS; CONSTRUCTION

1.1 Certain Definitions. The following terms shall have the following meanings in this Agreement:

"Accounting Methodology" means the accounting methods, practices and procedures used to prepare the Financial Statements.

"Action" means any claim, controversy, suit, action or cause of action, litigation, arbitration, investigation, opposition, interference, audit, hearing, demand, assessment, complaint, citation, proceeding, order or other legal proceeding (whether sounding in contract or tort or otherwise, whether civil, criminal, administrative or otherwise and whether brought at law or in equity or under arbitration or administrative regulation) and any written notice of violation, notice of potential responsibility or any notice alleging liability.

"Affiliate" means "*met een vennootschappen verbonden vennootschap*" / "*sociétés liées à une société*" as defined in Article 1:20,1° of the BCCA.

"BCCA" means the Belgian Code on Companies and Associations.

"Business" means the development and commercialization of software that autonomously diagnoses rare diseases.

"Business Day" means any day other than a Saturday, Sunday or any other day on which banking institutions in San Francisco, California or Belgium are authorized or required by Law or order to remain closed.

"Buyer Fundamental Representations" means the representations and warranties contained in Section 5.1 (Organization) and Section 5.2 (Authority; Noncontravention).

"Buyer Indemnified Person" means each of [*] and each of their respective successors and assigns.

"Buyer's Guarantor's Common Stock" means shares of Buyer's Guarantor's common stock, par value $0.0001 per share, or any other shares of capital stock into which such common stock may be reclassified, converted or exchanged.

"Buyer's Guarantor Fundamental Representations" means the representations and warranties contained in Section 5.1 (Organization) and Section 5.2 (Authority; Noncontravention).

"Cash Consideration Amount" means USD$32,000,000.

"Charter Documents" means, with respect to any entity, the incorporation deed and articles of association, the certificate of incorporation and bylaws, certificate of formation and operating agreement, or similar organizational documents of such entity.

"Closing Cash" means the value of all cash and cash equivalents held by the Company as of the Closing (before taking into account the consummation of the transactions contemplated hereby), determined in accordance with the Accounting Methodology, excluding, to the extent applicable, (i) outstanding (uncleared) checks, drafts, wire transfers or deposits in transit, and other debits and credits in-process, (ii) restricted balances, (iii) amounts held in escrow, (iv) amounts held in banks outside of the United States or Belgium in accounts that cannot be readily expatriated due to foreign exchange controls or other applicable Laws, (v) the proceeds of any casualty loss with respect to any asset held or owned by the Company (to the extent that any such asset has not been repaired or replaced or the liability for the repair or replacement of such asset has not been paid or accrued as a current liability), and (vi) cash received with respect to unperformed work or installations and reflected as deferred revenues on the Estimated Balance Sheet.

"Closing Net Working Capital" means, as of the Closing, an amount equal to (i) the *sum* of (x) the current assets of the Company, other than cash and cash equivalents, *plus* (y) Closing Cash, *reduced by* (ii) the liabilities of the Company (excluding Company Debt, but including all Company Transaction and Bonus Expenses), in each case as determined in accordance with the Accounting Methodology.

"Code" means the United States Internal Revenue Code of 1986, as amended, and the rules and regulations promulgated thereunder.

"Collection and Use" (and its variants) means the collection, use, interception, storage, receipt, purchase, sale, maintenance, transmission, transfer, disclosure, processing and/or use of Personal Data.

"Company Debt" means, as at any time with respect to the Company, without duplication, all Liabilities with respect to principal, accrued and unpaid interest, penalties, premiums and any other fees, expenses and breakage costs on and other payment obligations arising under any (i) indebtedness for borrowed money (including amounts outstanding under overdraft facilities), (ii) indebtedness issued in exchange for or in substitution for borrowed money, (iii) obligations for the deferred purchase price of property, goods or services other than trade payables arising in the Ordinary Course of Business (but including any deferred purchase price Liabilities, earnouts, contingency payments, seller notes, promissory notes or similar Liabilities, in each case, related to past acquisitions by the Company and for the avoidance of doubt, whether or not contingent), (iv) obligations evidenced by any note, bond, debenture, guarantee or other debt security or similar instrument or Contract, (v) liabilities under capitalized leases, (vi) obligations, contingent or otherwise, in respect of amounts drawn under letters of credit and banker's acceptance or similar credit transactions, (vii) obligations under Contracts relating to interest rate protection or other hedging arrangements, to the extent payable if such Contract is terminated at Closing, and (viii) guarantees of the types of obligations described in sub clauses (i) through (vii) above.

"Company Intellectual Property Rights" means all Intellectual Property Rights owned by the Company or used by the Company in connection with the business of the Company as currently conducted, including all Intellectual Property Rights in and to Company Technology.

"Company Plans" means (i) "employee benefit plans" (or any similar term under applicable Belgium Law), (ii) individual employment, consulting or severance agreements or arrangements and (iii) other benefit plans, policies, agreements or arrangements, including bonus or other incentive compensation, share purchase, equity or equity-based compensation, deferred compensation, profit sharing, severance, pension, retirement, welfare, sick leave, vacation, loans, salary continuation, health, dental, disability, flexible spending account, service award, fringe benefit, life insurance and educational assistance plan, policies, agreements or arrangements, whether written or oral, under which any Current Employee, Current Consultant or director of the Company participates and which is maintained, contributed to or participated in by the Company, or with respect to which the Company has or may have any obligation or liability, contingent or otherwise.

"Company Technology" means any and all Technology that is owned by the Company or used in connection with, or necessary to the conduct of, the business of the Company as currently conducted, including Proprietary Software.

"Company Transaction and Bonus Expenses" means an amount equal to (i) the aggregate fees and expenses payable or reimbursable by the Company to third parties in connection with negotiation, entering into and consummation of this Agreement and the Transactions, including the fees and expenses of investment bankers, finders, consultants, attorneys, accountants and other advisors engaged by the Company in connection with the Transactions, *plus* (ii) any bonus, severance or other payment that is created, accelerated, accrues or becomes payable by the Company to any present or former director, officer, Employee or Consultant, including pursuant to an employment agreement, Company Plan or any other Contract, as a result of the consummation of the Transactions or in connection with the execution and delivery of this Agreement or any other Transaction Agreement or the consummation of the Transactions. For the avoidance of doubt, the following shall not constitute Company Transaction and Bonus Expenses: (x) any severance payments as a result of any terminations effected by Buyer after the Closing; (y) any "double trigger" change of control obligations which have, as a second trigger, any termination effected by Buyer following the Closing; and (z) any retention or similar bonus awarded by Buyer or committed by Buyer to be paid following the Closing.

"Competitive Business" means [*].

"Contract" means any contract, loan or credit agreement, debenture, note, guaranty, bond, mortgage, indenture, deed of trust, license, lease or other agreement, arrangement or instrument (in each case, as applicable, whether written or oral) that is legally binding, as well as any term sheet, course of dealing or other arrangement pursuant to which any duty, obligation or Liability may exist.

"Data Room" means the virtual data room hosted by Intralinks made available to the Buyer and its advisors.

"Disclosure Schedule" means a document delivered by Seller to Buyer prior to the execution of this Agreement and referring to the warranties in Article III or Article IV, as applicable.

"Environmental Laws" means all Laws applicable to the Company relating in any way to the environment, preservation or reclamation of natural resources, the presence, management or Release of, or exposure to, Hazardous Materials, or to human health and safety, and any transfer of ownership notification or approval statute, as each has been amended and the regulations promulgated pursuant thereto.

"Environmental Liabilities" means, with respect to any Person, all liabilities, obligations, responsibilities, remedial actions, losses, damages, punitive damages, consequential damages, treble damages, liens, costs and expenses (including all reasonable fees, disbursements and expenses of counsel, experts and consultants and costs of investigation and feasibility studies), fines, penalties, sanctions and interest incurred as a result of any Action, claim or demand by any other Person or in response to any violation of Environmental Law, whether known or unknown, accrued or contingent, whether based in contract, tort, implied or express warranty, strict liability, criminal or civil statute or administrative regulation, to the extent based upon, related to, or arising under or pursuant to any Environmental Law, environmental Permit, order or agreement with any Governmental Authority or other Person, which relates to any environmental, health or safety condition, violation of Environmental Law or Release or threatened Release of Hazardous Materials.

"Final Purchase Price" means the *sum* of (i) the Stock Consideration Amount, *plus* (ii) the Indemnification Hold-Back Amount, *plus* (iii) the Cash Consideration Amount, *minus* (iv) the Company Debt, *minus* (v) the amount, if any, by which the Net Working Capital Threshold exceeds the Closing Net Working Capital, *plus* (vi) the amount, if any, by which the Closing Net Working Capital exceeds the Net Working Capital Threshold.

"Fundamental Representations" means, collectively, the Seller Fundamental Representations, the Buyer's Guarantor Fundamental Representations and the Buyer Fundamental Representations.

"GAAP" means the generally accepted accounting principles in Belgium.

"Governmental Authority" means any (i) nation, region, state, county, city, town, village, district or other jurisdiction, (ii) federal, state, local, municipal, foreign or other government, (iii) department, agency or instrumentality of a foreign or other government, including any state-owned or state-controlled instrumentality of a foreign or other government, (iv) governmental or quasi-governmental entity of any nature (including any governmental agency, branch, department or other entity and any court or other tribunal), (v) international or multinational organization formed by states or governments, (vi) organization that is designated by executive order pursuant to Section 1 of the United States International Organizations Immunities Act (22 U.S.C. 288 of 1945), as amended and the rules and regulations promulgated thereunder or (vii) other body entitled to exercise any administrative, executive, judicial, legislative, police or regulatory authority.

"Hazardous Materials" means any material, substance or waste that is regulated, classified, or otherwise characterized under

or pursuant to any Environmental Law as "hazardous", "toxic", a "pollutant", a "contaminant", "radioactive" or words of similar meaning or effect, including petroleum and its by-products, asbestos, polychlorinated biphenyls, radon, mold, urea formaldehyde insulation, chlorofluorocarbons and all other ozone-depleting substances.

"Health Care Laws" means all applicable Laws relating to health care regulatory and reimbursement matters, and all regulations, agency guidance, or similar legal requirements promulgated thereunder, including applicable (i) self-referral, anti-kickback, fee-splitting and patient brokering Laws, (ii) Information Privacy and Security Laws, including those related to genetic testing and the privacy of genetic testing results, and (iii) Laws governing the licensure and operation of clinical laboratories and billing for clinical laboratory services.

"HIPAA" means, collectively, the United States Health Insurance Portability and Accountability Act of 1996 as amended by the Health Information Technology for Economic and Clinical Health Act ("HITECH"), implementing regulations promulgated thereunder and related guidance issued from time to time.

"Indemnification Hold-Back Amount" means USD$9,500,000, which shall consist of shares of Buyer's Guarantor's Common Stock.

"Indemnification Hold-Back Shares" means a number of shares of Buyer's Guarantor's Common Stock equal to the *quotient* of (i) the Indemnification Hold-Back Amount *divided by* (ii) the Trailing Average Share Price.

"Indemnified Person" means a Buyer Indemnified Person or a Seller Indemnified Person, as applicable.

"Indemnifying Party" means Buyer or Seller, as applicable.

"Information Privacy and Security Laws" means all applicable Laws concerning the privacy and/or security of Personal Data (including any Laws of jurisdictions where the Personal Data was collected), and all regulations promulgated thereunder, including, where applicable, HIPAA, state data privacy and breach notification Laws, state social security number protection Laws, any applicable Laws concerning requirements for website and mobile application privacy policies and practices, data or web scraping, call or electronic monitoring or recording or any outbound communications (including, outbound calling and text messaging, telemarketing, and e-mail marketing), the European Union Directive 95/46/EC, the European Union General Data Protection Regulation (GDPR), and foreign, international (including Belgium), state and local consumer protection Laws.

"Information System" means software, hardware, computer and telecommunications equipment and other information technology and related services.

"Intellectual Property Rights" means the entire right, title and interest in and to all proprietary rights of every kind and nature however denominated, throughout the world, including: (i) patents, industrial designs, copyrights, mask work rights, trade secrets, database rights and all other proprietary rights in Technology; (ii) trademarks, trade names, service marks, service names, brands, trade dress, logos and other indicia of origin and the goodwill and activities associated therewith; (iii) domain names, rights of privacy and publicity and moral rights; (iv) any and all registrations, applications, recordings, licenses, common-law rights and contractual rights relating to any of the foregoing; and (v) all Actions and rights to sue at law or in equity for any past or future infringement or other impairment of any of the foregoing, including the right to receive all proceeds and damages therefrom and all rights to obtain renewals, continuations, divisions, or other extensions of legal protections pertaining thereto.

"Intentional Fraud" means the willful and knowing commission of fraud with the specific intent to deceive and mislead.

"IRS" means the United States Internal Revenue Service.

"Knowledge" means (i) with respect to any individual, the actual knowledge following reasonable due inquiry of the specified individual, and (ii) with respect to any entity, the actual knowledge of the executive officers of such entity following reasonable due inquiry; provided, however, the terms "Knowledge of the Company" or "to the Company's Knowledge" each mean the actual knowledge following reasonable due inquiry of Peter Schols.

"Law" means any United States federal, state or local or any foreign or international (including Belgian) law, statute, standard, ordinance, code, rule or regulation, resolution or promulgation or similar legal requirement or any Order or any similar provision having the force or effect of law and includes Health Care Laws and Information Privacy and Security Laws.

"Liability" means, with respect to any Person, any liability or obligation of such Person whether known or unknown, whether asserted or not asserted, whether determined, determinable or otherwise, whether absolute or contingent, whether accrued or unaccrued, whether liquidated or unliquidated, whether directly incurred or consequential, whether due or to become due and whether or not required under applicable generally accepted accounting principles to be accrued on the financial statements of such

Person.

"Lien" means any charge, encumbrance, claim, community or other marital property interest, equitable ownership interest, collateral assignment, lien (statutory or otherwise), license, option, pledge, security interest, mortgage, deed of trust, attachment, right of way, easement, restriction, encroachment, servitude, right of first offer or first refusal, buy/sell agreement and any other restriction or covenant with respect to, or condition governing the use, construction, voting (in the case of any equity interest), transfer, receipt of income or exercise of any other attribute of ownership of any kind or nature whatsoever affecting or attached to any asset.

"Loss" means [*].

"Net Working Capital Threshold" means USD$0.

"Order" means any Law, order, injunction (whether temporary, preliminary or permanent), judgment, decree, assessment, award or ruling enacted, promulgated, issued, entered, amended or enforced by any Governmental Authority.

"Ordinary Course of Business" means the ordinary course of business of the Company consistent with past practice in nature and amount.

"Permit" means any permit, license, franchise, certificate, accreditation approval, registration, notification or authorization from any Governmental Authority, or required by any Governmental Authority to be obtained, maintained or filed.

"Permitted Liens" means: (i) statutory liens with respect to the payment of Taxes, in all cases which are not yet due or payable or that are being contested in good faith by appropriate actions and for which appropriate reserves with respect thereto have been specifically established on the books and records of the Company to the extent required in accordance with GAAP; (ii) statutory liens of landlords, suppliers, mechanics, carriers, materialmen, warehousemen, service providers or workmen and other similar Liens imposed by Law created in the Ordinary Course of Business the existence of which could not constitute a default or breach under any of the Company's Contracts for amounts that are not yet delinquent and are not, individually or in the aggregate significant; (iii) building, zoning, entitlement and other land use regulations imposed by any Governmental Authority with jurisdiction over the Leased Real Property which are not violated by the current use or occupancy of such Leased Real Property, and (iv) easements, conditions, covenants and restrictions that are of record with respect to the Leased Real Property which are not violated by the current use or occupancy of such Leased Real Property or the operation of the Company's business or that do not and shall not adversely affect the value, or impair the use or current occupancy of the Leased Real Property.

"Person" means any natural person, corporation, limited liability company, partnership, association, trust or other entity, including a Governmental Authority.

"Personal Data" means, as applicable, (i) any and all information about an individual that either contains data elements that identify the individual or with respect to which there is a reasonable basis to believe the information can be used to identify the individual, (ii) any information that enables a Person to contact the individual (such as information contained in a cookie or an electronic device fingerprint) and (iii) any and all other information, the collection, use, sharing, transfer or other processing of which is regulated by any applicable Law in relation to data protection, data privacy or personal privacy, including personal healthcare information. Personal Data includes (v) personal identifiers such as name, address, Social Security Number, date of birth, driver's license number or state identification number, Taxpayer Identification Number and passport number, (w) financial information, including credit or debit card numbers, account numbers, access codes, consumer report information and insurance policy number, (x) demographic information, (y) unique biometric data, such as fingerprint, retina or iris image, voice print or other unique physical representation and (z) individual medical or health information (including information of patients, customers, employees, workers, contractors, and third parties who have provided information to the Company, and including information relating to services provided by or to third parties).

"Personal Data Obligations" means the Company's privacy policies (or applicable terms of use) as published on any Company websites or mobile applications or any other privacy policies (or applicable terms of use), Contracts, documents or promises or representations agreed to with employees, consumers or customers, or other Persons, and any applicable Laws regarding Collection and Use of Personal Data, including but not limited to Laws regarding the use of Personal Data for marketing communications such as the United States CAN SPAM Act of 2003 and any equivalent foreign or international (including Belgian) Law, as each has been amended and the regulations promulgated pursuant thereto.

"Pre-Closing Tax Period" means any taxable period ending on or before the Closing Date and, with respect to any taxable period ending after the Closing Date, any portion thereof ending on and including the Closing Date.

"Premises" means any building, plant, improvement or structure located on the Leased Real Property.

"Products and Services" means any product or service that the Company currently offers or sells.

"Proprietary Software" means any Software that is owned by Company and is related to the Company's Business as conducted by the Company.

"Public Software" means any software that is (i) distributed as free software or as open source software (e.g., Linux), (ii) subject to any licensing or distribution model that includes as a term thereof any requirement for distribution of source code to licensees or third parties, patent license requirements on distribution, restrictions on future patent licensing terms, or other abridgement or restriction of the exercise or enforcement of any Company Intellectual Property Rights through any means, (iii) licensed or distributed under any Public Software License or under less restrictive free or open source licensing and distribution models such as those obtained under the BSD, MIT, Boost Software License and the Beer-Ware Public Software Licenses or any similar licenses, (iv) a public domain dedication or (v) derived in any manner (in whole or in part) from, links to, relies on, is distributed with, incorporates or contains any software described in (i) through (iv) above.

"Public Software License" means any of the following licenses or distribution models, or licenses or distribution models similar to any of the following: (i) GNU's General Public License (GPL) or Lesser/Library GPL (LGPL); (ii) the Artistic License (e.g., PERL); (iii) the Mozilla Public License; (iv) the Netscape Public License; (v) the Sun Community Source License (SCSL); (vi) the Sun Industry Standards License (SISL); (vii) the Apache License; and (viii) any licenses that are defined as OSI (Open Source Initiative) licenses as listed on the Opensource.org website.

"Restrictive Term" means the period commencing on the Closing Date and ending on the [*] anniversary of the Closing Date.

"Reference Date" means January 1, 2016.

"Related Party" means (i) any current or former director (or nominee), or officer of the Company, (ii) Seller and (iii) any relative, spouse, officer, director or Affiliate of any of the foregoing Persons.

"Release" means any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, disposing of or migrating into or through the environment or any natural or man-made structure.

"Representatives" means, with respect to any Person, the officers, employees, investment bankers, financial advisors, attorneys, accountants, agents and other representatives of such Person.

"SEC" means the United States Securities and Exchange Commission.

"Securities Act" means the United States Securities Act of 1933, as amended.

"Seller Fundamental Warranties" means the warranties contained in Article III, as well as the representations and warranties contained in [*].

"Seller Intermediate Warranties" means the representations and warranties contained in [*].

"Seller Warranties" means the Seller Fundamental Warranties, the Seller Intermediate Warranties and other warranties given by the Seller in Article III and Article IV of this Agreement;

"Seller Indemnified Persons" means Seller and his Affiliates, as well as such Affiliates' respective equity holders, directors, officers, employees, agents, successors and assigns.

"Software" means computer software programs and software systems, including all databases, compilations, tool sets, compilers, higher level or "proprietary" languages, related documentation and materials (including all Source Code Materials), whether in source code, object code or human readable form, and all software programs and software systems that are classified as work-in-progress on the Closing Date.

"Source Code Materials" as it pertains to source code of any Software means (i) the software, tools and materials utilized for the operation, development and maintenance of the Software and (ii) any third-party software or other applications that form part of the source code version of the Software and are required in order to compile, assemble, translate, bind and load the Software into executable releases.

"Stock Consideration Amount" means the sum of (i) USD$63,000,000 *minus* (ii) the Indemnification Hold-Back Amount.

"Stock Consideration Shares" means a number of shares of Buyer's Guarantor's Common Stock equal to the *quotient* of (i) the Stock Consideration Amount, *divided by* (ii) the Trailing Average Share Price.

"Subsidiary" has the meaning set out in Article 1:15,2 of the BCCA.

"Tax" or "Taxes" means (i) any or all federal, state, local or foreign taxes or other assessments in the nature of taxes imposed by a Taxing Authority, including all net income, gross receipts, capital, sales, use, ad valorem, value added, transfer, franchise, profits, inventory, capital stock, withholding, payroll, employment, social security, unemployment, excise, severance, stamp, occupation, property and estimated taxes, and (ii) any or all interest, penalties or additions to tax imposed by any Taxing Authority in connection with any item described in clause (i).

"Tax Returns" means, with respect to Taxes, any return, report, claim for refund, estimate, information return or statement, declaration of estimated Tax or other similar document filed or required to be filed with any Taxing Authority with respect to Taxes, including any schedule or attachment thereto and including any amendment thereof.

"Tax Sharing Agreement" means any agreement relating to the sharing, allocation or indemnification of Taxes or amounts in lieu of Taxes, or any similar Contract or arrangement, other than any contract or arrangement entered into in the Ordinary Course of Business the purpose of which is not primarily related to Taxes.

"Taxing Authority" means any Governmental Authority responsible for the administration, assessment and collection of any Taxes.

"Technology" means all inventions, works, discoveries, innovations, know-how, information (including ideas, research and development, formulas, algorithms, compositions, processes and techniques, data, designs, drawings, specifications, customer and supplier lists, pricing and cost information, business and marketing plans and proposals, graphics, illustrations, artwork, documentation and manuals), databases, computer software, firmware, computer hardware, integrated circuits and integrated circuit masks, electronic, electrical and mechanical equipment and all other forms of technology, including improvements, modifications, works in process, derivatives, or changes, whether tangible or intangible, embodied in any form, whether or not protectable or protected by patent, copyright, mask work right, trade secret law, or otherwise and all documents and other materials recording any of the foregoing.

"Third Party Claim" refers to any Action that is instituted, or any claim that is asserted, by any Person not a Party to this Agreement in respect of an indemnifiable matter under this Agreement.

"Trailing Average Share Price" means the average closing price for shares of Buyer's Guarantor's Common Stock on the New York Stock Exchange (or any other exchange which is then the primary exchange upon which shares of Buyer's Guarantor's Common Stock are traded) for the twenty (20) trading day period immediately preceding the Closing Date, as adjusted by any stock split, division or subdivision of shares, stock dividend, reverse stock split, consolidation of shares, reclassification, recapitalization or other similar transaction with respect to shares of Buyer's Guarantor's Common Stock during such twenty (20) trading day period.

"Transactions" means any transaction or arrangement contemplated by this Agreement, including (i) the Share Purchase and the other transactions and arrangements described in the recitals to this Agreement and (ii) the execution, delivery and performance of the Transaction Agreements other than this Agreement.

"Transaction Agreements" means this Agreement, the Buyer RSU Award Agreements, the Employment Agreements, and the Registration Rights Agreement.

"Upfront Cash Consideration" means the *sum* of (i) the Cash Consideration Amount, *minus* (ii) the estimated Company Debt, *minus* (iii) the amount, if any, by which the Net Working Capital Threshold exceeds the estimated Closing Net Working Capital, *plus* (iv) the amount, if any, by which the estimated Closing Net Working Capital exceeds the Net Working Capital Threshold.

"Upfront Purchase Price" means the *sum* of (i) the Stock Consideration Amount, *plus* (ii) the Indemnification Hold-Back Amount, *plus* (iii) the Cash Consideration Amount, *minus* (iv) the estimated Company Debt, *minus* (v) the amount, if any, by which the Net Working Capital Threshold exceeds the estimated Closing Net Working Capital, *plus* (vi) the amount, if any, by which the estimated Closing Net Working Capital exceeds the Net Working Capital Threshold.

1.2 Terms Defined Elsewhere in this Agreement.

For purposes of this Agreement, the following terms have meanings set forth at the section of this Agreement indicated

opposite such term:

Term	Section
"1934 Act"	Section 5.4(a)
"Agreement Date"	Preamble
"Agreement"	Preamble
"Allocation Schedule"	Section 2.5
"Assets"	Section 4.13
"Balance Sheet Date"	Section 4.5(a)(i)
"Buyer Retention Amount"	Section 10.2(b)(i)(A)
"Buyer's Closing Obligations"	Section 8.1
"Buyer's Guarantor SEC Documents"	Section 5.4(a)
"Buyer's Guarantor"	Preamble
"Buyer"	Preamble
"Closing"	Section 2.4
"Closing Date"	Section 2.4
"Company Capital Stock"	Recitals
"Company Registrations"	Section 4.15(c)
"Company"	Recitals
"Confidential Information"	Section 7.3
"Conflict"	Section 4.2
"Consultant"	Section 4.1(b)
"Current Consultant"	Section 4.1(b)
"Current Employee"	Section 4.1(b)
"Director"	Section 7.7(a)
"Employee"	Section 4.1(b)
"Estimated Balance Sheet"	Section 2.5(c)
"Final Calculation"	Section 2.7(a)
"Financial Statements"	Section 4.5(a)(i)
"General Survival Date"	Section 10.1(a)
"Inbound IP Contracts"	Section 4.15(d)
"Indemnification Hold-Back Payment Date"	Section 2.8
"Initial Resolution Period"	Section 2.7(a)
"IP Contracts"	Section 4.15(d)
"Leased Real Property"	Section 4.14(a)
"Material Contracts"	Section 4.12(c)
"Non-Offset Notice"	Section 10.4(b)
"Non-Transfer Period"	Section 7.10(a)
"Objection Notice"	Section 2.7(a)
"Objection Period"	Section 2.7(a)
"Offset Certificate"	Section 10.3(b)
"Offset Right"	Section 10.3(a)
"Outbound IP Contracts"	Section 4.15(d)
"Party"	Preamble
"Payoff Amount"	Section 2.3(a)

"Post-Closing Adjustment"	Section 2.7(c)(i)
"Real Property Leases"	Section 4.14(a)
"Registration Rights Agreement"	Section 7.9
"Related Party Transaction"	Section 4.17
"Released Parties"	Section 7.6
"Reviewing Party"	Section 2.7(b)
"Rule 144"	Section 3.7(d)
"Security Program"	Section 4.15(g)(vi)
"Seller Prepared Tax Returns"	Section 7.4(a)
"Seller's Closing Obligations"	Section 8.2
"Seller"	Preamble
"Settlement"	Section 10.4(a)(iv)
"Share Purchase"	Recitals
"Shares"	Recitals
"Shrink Wrap Licenses"	Section 4.15(a)(i)
"Stated Damages"	Section 10.3(b)
"Survival Date"	Section 10.1(a)
"Third Party Indemnification Claim Notice"	Section 10.4(a)(i)
"Third Party Software"	Section 4.15(d)
"Top Supplier"	Section 4.18
"Transfer Taxes"	Section 7.4(g)

ARTICLE II

THE CONTEMPLATED TRANSACTIONS

2.1 Purchase and Sale of the Shares.

(a) Upon the terms and subject to the conditions set forth in this Agreement, at the Closing, Seller shall sell, transfer and deliver to Buyer, and Buyer shall purchase from Seller, all of Seller's Shares, which Shares shall be sold to Buyer free and clear of all Liens (other than Liens arising under applicable securities laws).

(b) In full payment for Seller's Shares and subject to the provisions of this Agreement (including the Offset Right), Buyer (or Buyer's Guarantor, on behalf of Buyer) shall deliver to Seller the following in respect of such Shares:

(i) within three (3) Business Days after the Closing Date, a book entry reflecting the Stock Consideration Shares;

(ii) on the Closing Date, an amount of cash equal to the Upfront Cash Consideration in immediately available funds;

(iii) if the Post-Closing Adjustment is a positive number, an amount of cash equal to the Post-Closing Adjustment; and

(iv) within three (3) Business Days after the Indemnification Hold-Back Payment Date (and, if applicable with respect to any portion of the Indemnification Hold-Back Amount then subject to dispute with respect to any Offset Right or indemnification obligation with respect thereto, three (3) Business Days after the resolution of such dispute), a book entry reflecting the Indemnification Hold-Back Shares, to the extent released to Seller as provided in Section 2.8.

2.2 No Fractional Shares; Total Shares Issuable; Assignment of Right to Receive Consideration. Notwithstanding any provision herein to the contrary, (i) no fractional shares of Buyer's Guarantor's Common Stock shall be issued pursuant to this Article II (with the intended effect that any shares of Buyer's Guarantor's Common Stock shall be rounded up to the nearest whole number) and (ii) Seller may not assign or transfer any right to receive shares of Buyer's Guarantor's Common Stock or cash pursuant to this Agreement without the prior written consent of Buyer (which may be withheld in Buyer's sole discretion).

2.3 Other Closing Payments. At the Closing, Buyer shall make, or cause to be made, the following additional payments, by wire transfer of immediately available funds:

(a) to each holder of Company Debt, the aggregate amount of Company Debt owed to such holder as of the Closing (the principal amounts of which are set forth on Section 4.5(g) of the Disclosure Schedule) pursuant to a payoff letter from such holder (i) indicating the amount required to discharge such Company Debt in full (the "Payoff Amount") and (ii) agreeing to release applicable Liens upon receipt of the applicable Payoff Amount; and

(b) to the payees thereof, the Company Transaction and Bonus Expenses, in each case as directed in writing by Seller or the Company to Buyer pursuant to invoices or other evidence setting forth all amounts payable to the applicable payee.

2.4 Closing. The closing of the Transactions (the "Closing") shall take place promptly after 1:00 p.m. (San Francisco time) on March 10, 2020, at the offices of Pillsbury Winthrop Shaw Pittman LLP, 12255 El Camino Real, Suite 300, San Diego, California 92130, unless another time, date or place is agreed to in writing by the Parties (the "Closing Date").

2.5 Delivery of Calculations. On the Closing Date, Seller has caused the Company to prepare and deliver to Buyer:

(a) the Company's calculation of the Upfront Purchase Price, setting forth, in reasonable detail, an estimation of each component thereof;

(b) the Company's calculation of the Stock Consideration Shares;

(c) the Company's estimated balance sheet as of immediately prior to the Closing (the "Estimated Balance Sheet"), with separate schedules reflecting (i) the estimated Closing Cash, (ii) the estimated Company Debt, (iii) the estimated Company Transaction and Bonus Expenses and (iv) the estimated Closing Net Working Capital as well as the delta between the estimated Closing Net Working Capital and the Net Working Capital Threshold; and

(d) the name, address, email address and tax identification number of Seller.

The calculations listed in the foregoing Sections 2.5(a) through 2.5(c) shall be set forth on a spreadsheet referred to herein as the "Allocation Schedule". The Parties agree that Buyer and the Company will have the right to rely on the Allocation Schedule as setting forth a true and complete listing of all amounts due to be paid by Buyer to Seller in exchange for the Shares. Notwithstanding anything in this Agreement to the contrary, the Estimated Balance Sheet and the Company's estimation of the Closing Net Working Capital shall be consistent with the Accounting Methodology and shall reflect all vacation, sick leave, severance and/or other remuneration required by Law, Contract or policy of the Company to be paid to Employees for periods on or prior to the Closing.

2.6 Withholding. Notwithstanding anything in this Agreement to the contrary, Buyer and the Company shall be entitled to deduct and withhold from that portion of any payments contemplated by this Article II or any other amount payable to Seller pursuant to this Agreement, and shall pay to the appropriate Taxing Authority, such amounts that are required to be deducted and withheld with respect to the making of such payments under any Tax Law. To the extent amounts are so deducted and withheld and paid to the appropriate Taxing Authority, such amounts shall be treated for purposes of this Agreement as having been paid to Seller.

2.7 Post-Closing Adjustment.

(a) Preparation of Closing Statement. Within one hundred twenty (120) days following the Closing Date, Buyer shall prepare and deliver to Seller a statement as of the Closing (the "Final Calculation") setting forth its calculation of each of the following:

(i) the Closing Cash;

(ii) the Closing Net Working Capital;

(iii) the Company Transaction and Bonus Expenses;

(iv) the Company Debt; and

(v) the resulting Final Purchase Price.

The Final Calculation shall be accompanied by such supporting documentation reasonably necessary to derive the numbers set forth therein. The Final Calculation shall be final, conclusive and binding upon the Parties unless Seller delivers a written notice to Buyer of any objection to the Final Calculation (the "Objection Notice") within thirty (30) days (the "Objection Period") after delivery of

the Final Calculation. Any Objection Notice must set forth in reasonable detail (x) any item on the Final Calculation that Seller believes has not been prepared in accordance with this Agreement and the correct amount of such item and (y) Seller's alternative calculation of the Closing Cash, the Closing Net Working Capital, the Company Transaction and Bonus Expenses or Company Debt, as the case may be. Any Objection Notice must specify, with reasonable particularity, all facts that form the basis of such disagreements and all documents relied upon by Seller as forming the basis of such disagreement. If Seller gives any such Objection Notice within the Objection Period, then Seller and Buyer shall attempt in good faith to resolve any dispute concerning the item(s) subject to such Objection Notice. If Seller and Buyer do not resolve the issues raised in the Objection Notice within thirty (30) days of the date of delivery of such notice (the "Initial Resolution Period"), such dispute shall be resolved in accordance with the procedures set forth in Section 2.7(b). Any item or amount which has not been disputed in the Objection Notice shall be final, conclusive and binding on the Parties on the expiration of the Initial Resolution Period.

(b) Resolution of Disputes. If Buyer and Seller have not been able to resolve a dispute within the Initial Resolution Period, either Party may submit such dispute to and such dispute shall be resolved fully, finally and exclusively through the use of an independent international accounting firm selected to serve as such by mutual agreement of Buyer and Seller (such accounting firm, the "Reviewing Party"). The fees and expenses of the Reviewing Party incurred in the resolution of such dispute shall be borne and advanced by the parties in such proportion as is appropriate to reflect the relative benefits received by Seller and Buyer from the resolution of the dispute. For example, if Seller challenges the calculation in the Final Calculation by an amount of USD$100,000, but the Reviewing Party determines that Seller has a valid claim for only USD$40,000, Buyer shall bear 40% of the fees and expenses of the Reviewing Party and Seller shall bear the other 60% of such fees and expenses. The Reviewing Party shall determine (with written notice thereof to Seller and Buyer) as promptly as practicable, but in any event within thirty (30) days following the date on which Final Calculation and written submissions detailing the disputed items are delivered to the Reviewing Party (i) whether the Final Calculation was prepared in accordance with the terms of this Agreement or, alternatively, (ii) only with respect to the disputed items submitted to the Reviewing Party, whether and to what extent (if any) the Final Calculation requires adjustment and a written explanation in reasonable detail of each such required adjustment, including the basis therefor (it being understood that any determination of a disputed item shall be not greater or less than the amount of such disputed item as proposed by Buyer in the Final Calculation or as proposed by Seller in the Objection Notice). Buyer and Seller shall require the Reviewing Party to enter into a confidentiality agreement on terms agreeable to Buyer, Seller and the Reviewing Party. The procedures of this Section 2.7(b) are exclusive and the determination of the Reviewing Party shall be final and binding on the Parties. The decision rendered pursuant to this Section 2.7(b) may be filed as a judgment in any court of competent jurisdiction.

(c) Post-Closing Purchase Price Adjustment.

(i) The "Post-Closing Adjustment" shall be an amount equal to the Final Purchase Price less the Upfront Purchase Price and, for the avoidance of doubt, may be a positive or a negative number or zero.

(ii) Without limiting the provisions of Section 10.2(a)(i) (except to the extent of any double counting that would otherwise result), if the Post-Closing Adjustment is a negative number, the Indemnification Hold-Back Amount shall be reduced by the absolute value of the Post-Closing Adjustment (i.e., offsetting the Post-Closing Adjustment against the Indemnification Hold-Back Amount), but in no event shall the Indemnification Hold-Back Amount or the number of Indemnification Hold-Back Shares be a negative number.

(iii) If the Post-Closing Adjustment is a positive number, Buyer shall deliver to Seller cash in an amount equal to the Post-Closing Adjustment.

(d) No Effect on Warranties. The provisions of this Section 2.7, as well as any adjustment to the Final Purchase Price as a result of any of the Closing Cash, the Closing Net Working Capital, the Company Transaction and Bonus Expenses and the Company Debt, shall not diminish or otherwise affect the right or ability of Buyer to rely upon the provisions of this Agreement, including the Seller Warranties set forth in Article III and Article IV.

2.8 Indemnification Hold-Back Shares and Payment. On the date that is eighteen (18) months following the Closing Date (such date, the "Indemnification Hold-Back Payment Date"), Buyer shall deliver to Seller the Indemnification Hold-Back Shares reflecting any reductions to the Indemnification Hold-Back Amount made in accordance with Section 2.7(c)(ii) or Article X (and, for the avoidance of doubt, calculated in accordance with Section 10.3(f)); provided, however, that if, when any amount would otherwise be distributed pursuant to this Section 2.8, Buyer shall have previously delivered to Seller a good faith claim by Buyer to exercise the Offset Right in accordance with Section 10.3 that has not yet been finally determined, Buyer shall be entitled to withhold an amount representing the Stated Damages at issue from payment until such time as the claim has been finally resolved, in which case the Offset Right shall apply against such portion of the amount at issue and the balance of any withheld portion (if applicable) shall be distributed to Seller as contemplated by this Agreement.

ARTICLE III

WARRANTIES WITH RESPECT TO SELLER

Except as set forth in the Disclosure Schedule, Seller hereby warrants to Buyer on the Closing Date as follows:

3.1 Title. Seller lawfully owns, and has the direct or indirect free and unencumbered title to, all of the Shares. Aside from the Shares, there are no current or future right to (nor have any promises or inducements been made to any Person with respect to) any equity, stock options or other ownership interest in the Company.

3.2 Authority. Seller has all requisite power and full legal right to enter into this Agreement and the other Transaction Agreements to which Seller is a party and to perform all of Seller's agreements and obligations hereunder and thereunder. This Agreement has been, and the other Transaction Agreements to which Seller is a party will be, duly executed and delivered by Seller and each such agreement will, once executed, constitute the legal, valid and binding obligations of Seller, enforceable against Seller in accordance with their terms, except (i) as limited by applicable bankruptcy, insolvency, reorganization, moratorium, fraudulent conveyance, or other laws of general application relating to or affecting the enforcement of creditors' rights generally, or (ii) as limited by laws relating to the availability of specific performance, injunctive relief or other equitable remedies.

3.3 Non-Contravention. The execution and delivery of this Agreement and the other Transaction Agreements to which Seller is a party by Seller and the consummation by Seller of the transactions contemplated hereby and thereby will not constitute a material violation of, or be in conflict in any material respect with, any Order applicable to Seller.

3.4 Governmental Consents. No consent, approval or authorization of, or registration, qualification or filing with, any Governmental Authority is required for the execution and delivery by Seller of this Agreement or the other Transaction Agreements to which Seller is a party or the consummation by Seller of the transactions contemplated hereby or thereby.

3.5 Litigation. There is no Action pending or, to Seller's Knowledge, threatened which in any manner challenges or seeks to prevent, enjoin, materially alter or materially delay the consummation by Seller of the transactions contemplated by this Agreement or the other Transaction Agreements to which Seller is a party.

3.6 No Broker and No Transaction Expenses. No finder, broker, agent or other similar intermediary has acted for or on behalf of Seller in connection with the negotiation of this Agreement or the consummation of the transactions contemplated hereby.

3.7 Investment.

(a) Seller (i) has experience investing in unregistered and restricted securities of speculative and high risk companies, (ii) has such knowledge and experience in financial and business matters that Seller is capable of evaluating the merits and risks of an acquisition of shares of Buyer's Guarantor's Common Stock as represented hereby, (iii) by reason of Seller's financial and business experience, has the capacity to protect Seller's interest in connection with the acquisition of shares of Buyer's Guarantor's Common Stock as represented hereby, (iv) is financially able to bear the economic risk of an investment in shares of Buyer's Guarantor's Common Stock as represented hereby, including the total loss thereof, (v) is an individual, (vi) has received and reviewed all information Seller considers necessary or appropriate for deciding whether to invest in shares of Buyer's Guarantor's Common Stock, (vii) has had an opportunity to ask questions and receive answers from Buyer and its officers and employees regarding an investment in shares of Buyer's Guarantor's Common Stock and regarding the business, financial affairs and other aspects of Buyer, and (viii) has further had the opportunity to obtain any information (to the extent Buyer possesses or can acquire such information without unreasonable effort or expense) which Seller deems necessary to evaluate an investment in shares of Buyer's Guarantor's Common Stock.

(b) Seller is an "accredited investor" as defined in Rule 501(a) of Regulation D under the Securities Act.

(c) Seller acknowledges and understands that (i) the shares of Buyer's Guarantor's Common Stock issuable to Seller as contemplated hereby have not been registered under the Securities Act in reliance, in part, on the warranties of Seller in this Section 3.7 and (ii) such shares are being acquired by Seller for investment purposes for Seller's own account only and not for sale or with a view to distribution of all or any part of such shares. Seller has no present plan or intention to sell, exchange or otherwise dispose of any of the shares of Buyer's Guarantor's Common Stock issuable to Seller as contemplated hereby.

(d) Seller understands (i) that the shares of Buyer's Guarantor's Common Stock issuable to Seller as contemplated hereby are "restricted securities" under the United States federal securities laws in that such shares will be acquired from Buyer in a transaction not involving a public offering, and that under such laws and applicable regulations such shares may be resold without registration under the Securities Act only in certain limited circumstances and that otherwise such shares must be held indefinitely,

and (ii) the resale limitations imposed by the Securities Act as well as Rule 144 ("Rule 144") of the SEC and the conditions which must be met in order for Rule 144 to be available for resale of "restricted securities," including the requirement that the shares of Buyer's Guarantor's Common Stock issuable to Seller as contemplated hereby, unless registered for resale under the Securities Act, must be held for at least six (6) months after issuance from Buyer (or (1) year in the absence of publicly available information about Buyer) and the condition that there be available to the public current information about Buyer under certain circumstances.

(e) Seller further agrees not to make any disposition of all or any portion of the shares of Buyer's Guarantor's Common Stock issuable to Seller as contemplated hereby unless and until: (i) there is then in effect a registration statement under the Securities Act covering such proposed disposition and such disposition is made in accordance with such registration statement, any applicable requirements of state securities laws, and any applicable Buyer policies concerning trading blackout periods; or (ii) Seller shall have notified Buyer of the proposed disposition and shall have furnished Buyer with a detailed statement of the circumstances surrounding the proposed disposition, and if reasonably requested by Buyer, Seller shall have furnished Buyer with a written opinion of counsel, reasonably satisfactory to Buyer, that such disposition will not require registration of any securities under the Securities Act or the consent of or a permit from appropriate authorities under any applicable state securities law; provided, however, that (x) Buyer will not require opinions of counsel for transactions made pursuant to Rule 144 so long as Buyer is provided on a timely basis with all certificates and other information Buyer may reasonably request to permit Buyer to determine that the subject disposition is, in fact, exempt from the registration requirements of the Securities Act pursuant to Rule 144, (y) in addition to the other matters set forth in this paragraph, Seller shall promptly forward to Buyer a copy of any Form 144 filed with the SEC with respect to any proposed disposition and a letter from the executing broker satisfactory to Buyer evidencing compliance with Rule 144, and (z) if Rule 144 is amended or if the SEC's interpretations thereof in effect at the time of any proposed disposition have changed from its present interpretations thereof as of the Closing Date, Seller shall provide Buyer with such additional documents and assurances as Buyer may reasonably require.

(f) Seller understands that any book entries or certificates evidencing the shares of Buyer's Guarantor's Common Stock issuable to Seller as contemplated hereby may bear one or all of the following legends (or substantially similar legends):

(i) "THESE SECURITIES HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED. THEY MAY NOT BE SOLD, OFFERED FOR SALE, TRANSFERRED, PLEDGED OR HYPOTHECATED IN THE ABSENCE OF A REGISTRATION STATEMENT IN EFFECT WITH RESPECT TO THE SECURITIES UNDER SUCH ACT OR AN OPINION OF COUNSEL SATISFACTORY TO THE COMPANY THAT SUCH REGISTRATION IS NOT REQUIRED OR UNLESS SOLD PURSUANT TO RULE 144 UNDER SUCH ACT."

(ii) Any legend required by applicable state securities laws.

Seller understands and agrees that stop transfer instructions may be given to Buyer's transfer agent with respect to the shares of Buyer's Guarantor's Common Stock issuable to Seller as contemplated hereby.

(g) Seller has carefully read the provisions of this Agreement, including the provisions of this Article III, and has discussed their requirements and other applicable limitations upon Seller's ability to sell, transfer or otherwise dispose of the shares of Buyer's Guarantor's Common Stock issuable to Seller as contemplated hereby, to the extent that Seller felt necessary, with Seller's personal counsel or counsel to the Company.

3.8 Taxes. Seller has been advised and has had the opportunity to seek the advice of Seller's tax advisor and to make Seller's own determination with respect to this Agreement and the transactions contemplated hereby. By entering into this Agreement, Seller will bear any and all Liabilities for Taxes (i) of Seller, and (ii) in respect of the transactions contemplated by this Agreement to the extent such Taxes are the responsibility of Seller under applicable Law. Seller is not, and never has been, a "United States person" (as defined pursuant to Section 7701(a)(30) of the Code).

ARTICLE IV

WARRANTIES OF SELLER WITH RESPECT TO THE COMPANY

Except as set forth in the Disclosure Schedule, Seller hereby warrants to Buyer on the Closing Date as follows:

4.1 Organizational Matters.

(a) Valid Existence; Good Standing. The Company is a limited liability company duly formed, validly existing and in good standing under the Laws of Belgium and has all requisite power and authority to own or lease all of its properties and assets and to carry on its business as now conducted. The Company is duly licensed or qualified to do business and is in good standing in

Belgium and each other jurisdiction in which the nature of the business conducted by it or the character or location of the properties and assets owned, leased or licensed by it makes such licensing or qualification necessary.

(b) Operations. Section 4.1(b) of the Disclosure Schedule lists each state and country in which the Company has any employee (each a "Current Employee") or has assets or leases Real Property. Current Employees, together with any former employees of the Company, are referred to herein individually as an "Employee" and collectively as "Employees." Section 4.1(b) of the Disclosure Schedule also lists each state and country in which the Company has any individual consultant or independent contractor or director (who is not an Employee) (each a "Current Consultant") as on the Closing Date. Current Consultants, together with any former individual consultant or independent contractor or director (who is not an Employee) of the Company, are referred to herein individually as a "Consultant" and collectively as "Consultants."

(c) Subsidiaries. The Company has no Subsidiaries. The Company does not own and never has owned, directly or indirectly, any shares of capital stock, voting securities, or equity interests in any Person. The Company has no obligation to make an investment (in the form of a purchase of equity securities, loan, capital contribution or otherwise) directly or indirectly in any Person.

(d) Corporate Documents. The Company has delivered to Buyer true and complete copies of the Company's Charter Documents. All such Charter Documents are unmodified and in full force and effect and the Company is not in violation of any provision of such Charter Documents. Neither Seller nor any director of the Company have proposed or approved any amendment of any of the Company's Charter Documents. The Company has delivered to Buyer and its Representatives true and complete copies of the share register of the Company and of the minutes of all meetings of the directors and each committee of the directors of the Company held since the Reference Date.

(e) Directors. Section 4.1(e) of the Disclosure Schedule lists all of the directors of the Company as on the Closing Date.

4.2 Noncontravention. Neither the negotiation, execution, delivery nor performance of this Agreement nor the consummation of the Transactions shall (i) conflict with or result in any violation of or default under (with or without notice or lapse of time, or both), (ii) give rise to a right of termination, cancellation or modification, or acceleration of any obligation or result in the creation of any Lien upon any of the material properties or assets of the Company, or (iii) give rise to any Action by any Person (any such event, a "Conflict") under or pursuant to (x) any provision of the Company's Charter Documents or any resolutions adopted by the Company's directors or by Seller, (y) any Material Contract to which the Company is a party or by which any of its properties or assets are bound or affected (including, for this purpose, any Material Contract with the Company's actual or potential clients, customers, partners or acquirers), or (z) any Permit issued to the Company or any Order applicable to the Company or any of its properties or assets (whether tangible or intangible). Following the Closing Date, the Company shall continue to be permitted to exercise all of its rights under all Material Contracts to which it is a party without the payment of any additional amounts or consideration other than ongoing fees, royalties or payments which the Company would otherwise be required to pay pursuant to the terms of such Contracts had the Transactions contemplated by this Agreement not occurred.

4.3 Capitalization.

(a) Authorized and Issued Securities. The capitalization of the Company is as follows: 186 Shares of Company Capital Stock are validly issued. Except as set forth in the Disclosure Schedule, there are no, and as on the Closing there shall be no, Shares of Company Capital Stock, voting securities or equity interests of the Company issued and outstanding or any subscriptions, options, profits units, warrants, calls, convertible or exchangeable securities, rights, commitments or agreements of any character providing for the issuance of any Shares of Company Capital Stock, voting securities or equity interests of the Company, including any representing the right to purchase or otherwise receive any Shares of Company Capital Stock.

(b) Ownership of Company Capital Stock. All issued Shares of Company Capital Stock are lawfully owned by Seller.

(c) Valid Issuance; No Preemptive or Other Rights.

(i) All issued Shares of Company Capital Stock (x) are duly authorized and validly issued, (y) are not subject to, nor were issued in violation of, any preemptive rights, rights of first offer or refusal, co-sale rights or similar rights arising under applicable Law or pursuant to the Company's Charter Documents, or any Contract to which the Company is a party or by which it is bound and (z) have been offered, issued, sold and delivered by the Company in compliance with all registration or qualification requirements (or applicable exemptions therefrom) of applicable Laws. The Company is not under any obligation to register any of its presently outstanding securities, or securities issuable upon exercise or conversion of such securities, under the Securities Act or any other (including Belgian) Law.

(ii) The rights, preferences and privileges of the Shares of Company Capital Stock are as set forth in the Company's Charter Documents. There is no liability for distributions accrued and/or declared but unpaid with respect to the Shares of Company Capital Stock. The Company is not subject to any obligation to repurchase, redeem or otherwise acquire any Shares of Company Capital Stock or any other voting securities or equity interests (or any options, profits interests, warrants or other rights to acquire any Shares of Company Capital Stock, voting securities or equity interests) of the Company. There are no voting trusts or other agreements or understandings with respect to the voting of the Shares of Company Capital Stock. There are no outstanding or authorized stock appreciation, phantom stock, profit participation, or other similar rights with respect to the Company.

4.4 No Consents or Approvals. No consents or approvals of, filings with, or notices to any Governmental Authority or Person are required to be made or obtained by the Company in connection with the consummation of the Transactions and the operation of the Company's business in the ordinary course after Closing, including the continued validity of the Company's Permits.

4.5 Financial Matters.

(a) Financial Statements.

(i) Prior to the Closing Date, the Company has delivered to Buyer complete copies of the following financial statements of the Company (collectively, the "Financial Statements"): the unaudited balance sheet and related audited statements of income, cash flows and stockholders' equity as of and for the fiscal year ended December 31, 2019 (the "Balance Sheet Date").

(ii) The books and records of the Company (x) have been and are being maintained in accordance with GAAP and (y) are properly maintained and do not contain or reflect any material inaccuracies or discrepancies.

(b) Fair Presentation. The Financial Statements were prepared in accordance with GAAP applied on a consistent basis throughout the periods covered thereby. The Financial Statements fairly present the financial condition of the Company as of such dates and the results of operations of the Company for such periods, and were derived from and are consistent with the books and records of the Company; provided, however, that the Financial Statements for interim periods are subject to normal year-end adjustments (which shall not be material individually or in the aggregate). Since the Reference Date, the Company has not effected any change in any method of accounting or accounting practice.

(c) Internal Controls; Financial Controls. The Company maintains systems of accounting and financial reporting controls that are customary for the size of the Company to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with GAAP, including policies and procedures sufficient to provide reasonable assurance: (i) that the Company maintains records that in reasonable detail reflect the Company's transactions and dispositions of assets; (ii) that transactions are recorded as necessary to permit the preparation of financial statements in conformity with GAAP; (iii) that receipts and expenditures are being made only in accordance with authorizations of management and the Company's directors; and (iv) regarding prevention or timely detection of unauthorized acquisition, use or disposition of the Company's assets that could have a material effect on the Financial Statements. The Company has delivered to Buyer a copy of any disclosure (or, if unwritten, a summary thereof) by any representative of the Company to the Company's independent auditors relating to any material weaknesses in internal controls and any significant deficiencies in the design or operation of internal controls that would adversely affect the ability of the Company to record, process, summarize and report financial data. The Company has no Knowledge of any fraud or whistle-blower allegations, whether or not material, that involve management or other Employees or Consultants who have or had a significant role in the internal control over financial reporting of the Company. Since the Reference Date, there have been no changes in the Company's internal control over financial reporting.

(d) No Undisclosed Liabilities. The Company does not have any Liabilities that are not reflected or reserved against on the face of (and not in the notes to) the Financial Statements, except Liabilities (i) incurred by the Company in connection with the preparation, execution, delivery and performance of the Transaction Agreements and included in the Company Transaction and Bonus Expenses, or (ii) which have arisen in the Ordinary Course of Business since the Balance Sheet Date and which are not in excess of USD$25,000 in the aggregate.

(e) Off-Balance-Sheet Arrangements. There are no "off-balance-sheet arrangements" with respect to the Company.

(a) Bank Accounts. Section 4.5(f) of the Disclosure Schedule sets forth an accurate list and summary description (including account type, name and address) of each bank and other financial institution in which the Company maintains an account (whether checking, savings or otherwise), lock box or safe deposit box and the names of the persons having signing authority or other access thereto. All cash in such accounts is held in demand deposits and is not subject to any restriction as to withdrawal.

(b) Company Debt. Except as set forth in Section 4.5(g) of the Disclosure Schedule, there is no Company Debt. With respect to each item of Company Debt, Section 4.5(g) of the Disclosure Schedule accurately sets forth the name and address of the creditor, the Contract under which such debt was issued, the principal amount of the debt and a description of the collateral if secured. The Company is not in default with respect to any outstanding Company Debt or any instrument relating thereto, nor is there any event which, with the passage of time or giving of notice, or both, would result in a default, and no such Company Debt or any instrument or agreement thereto purports to limit the operation of the Company's business. Complete and correct copies of all instruments (including all amendments, supplements, waivers and consents) relating to any Company Debt have been provided to Buyer.

4.6 Absence of Certain Changes or Events. Since the Balance Sheet Date, there has not occurred any damage, destruction or loss (whether or not covered by insurance) of any material asset of the Company that adversely affects the use thereof. Since the Balance Sheet Date, the Company has been operated in the Ordinary Course of Business.

4.7 Legal Proceedings. Since the Reference Date, there have not been and there are no pending Actions, and there are no Actions threatened in writing, in either case, by or against the Company, its properties or assets or any of the Company's employees or directors in their capacities as such, nor, to the Company's Knowledge, are there any circumstances that would constitute a basis therefor.

4.8 Compliance with Laws; Permits.

(a) The Company is and has at all times been, in compliance in all material respects with all Laws applicable to the Company or any of its properties, assets, business or operations, including all Health Care Laws, but excluding matters that are covered by the more specific Seller Warranties set out in Sections 4.10(f)(iv)(B) and 4.15. The Company holds all Permits necessary to conduct its business and own, lease and operate its properties and assets and all such Permits are in full force and effect. The Company is in compliance, in all material respects, with the terms of all Permits necessary to conduct its business and to own, lease and operate its properties and facilities. Section 4.8(a) of the Disclosure Schedule sets forth a list of all Permits that are held by the Company. The Company has not received notice from any Governmental Authority claiming or alleging that the Company was not in compliance with all Laws applicable to the Company or its business or operations; the Company has not been assessed a penalty with respect to any alleged failure by the Company to have or comply with any Permit.

(b) The Company and its directors and, to the Company's Knowledge, its Employees and Consultants, have, in the operating of the Company's business, not engaged in any activities which are prohibited or are cause for criminal or civil penalties or mandatory exclusion under any state or federal healthcare program under Belgian Laws.

(c) Neither the Company nor any of its directors or Employees, nor to the Company's Knowledge, any of its Consultants or agents, has, directly or indirectly given or agreed to give any illegal gift, contribution, payment or similar benefit to any supplier, customer, governmental official or employee or other Person.

(d) (i) Each Current Employee and Current Consultant of the Company required to be licensed by an applicable Governmental Authority, professional body and/or medical body has such licenses, (ii) such licenses are in full force and effect, and (iii) to the Knowledge of the Company, there are no facts or circumstances that could reasonably be expected to result in any such licenses being suspended, revoked or otherwise lapse prematurely.

(e) Neither the Company nor any of its Employees, nor to the Company's Knowledge, any of its Consultants, other agents or vendors has been excluded, suspended, debarred or otherwise sanctioned by any Governmental Authority, including the U.S. Department of Health and Human Services Office of Inspector General, the General Services Administration or any equivalent foreign or international (including Belgian) Governmental Authority.

(f) The Company has at all times complied in all respects with all rules, policies, and procedures established by the Company as applicable with respect to privacy, security, data protection, or the collection and use of health information and genetic testing information created, used, disclosed or stored in the course of the operations of the Company. No actions have been asserted or, to the Knowledge of the Company, threatened against the Company by any person alleging a violation of such person's privacy, personal, or confidentiality rights under any such rules, policies, or procedures.

(g) With respect to all health information and genetic testing information as described in Section 4.8(f), the Company has taken reasonable steps (including implementing and monitoring compliance with administrative, physical and technical safeguards) to ensure that such information is protected against loss and against unauthorized access, use, modification, disclosure, or other misuse. Since the Reference Date, there has been no unauthorized use or disclosure of any health information or genetic testing information. The Company maintains systems, policies and procedures to respond to incidents and complaints

alleging violations of applicable privacy or security standards and to identify and report all Breaches of Unsecured Protected Health Information in accordance with Company's legal and contractual obligations.

4.9 Taxes.

(a) The Company has paid all Taxes due by the Company. Since the Balance Sheet Date, the Company has not incurred any Liability for Taxes arising outside the Ordinary Course of Business. There are no Liens for Taxes (other than Permitted Liens) on any of the Company's assets or on any of the Shares. The Company is not subject to any currently effective waiver of any statute of limitations in respect of Taxes or agreed to any currently effective extension of time with respect to a Tax assessment or deficiency. The Company has not been or is not liable to pay any penalty, fine, interest or similar amount in relation to Tax and to Seller's knowledge, (i) there are no facts which are likely to cause the Company to become liable to pay any such penalty, fine, surcharge or interest, (ii) nor have there been any circumstances which might have a negative effect with regard to such a penalty.

(b) The Company has made a full, true and correct disclosure of all information it is obliged to disclose by applicable Law to any Tax Authority within the time and the manner prescribed by applicable Law.

(c) The Company has timely filed all Tax Returns that are required to have been filed by or with respect to the Company. All such Tax Returns are true, correct and complete in all material respects and were filed in compliance with all applicable Laws. The Company is not the beneficiary of any currently effective extension of time within which to file any Tax Return. No written claim has ever been made by any Taxing Authority in a jurisdiction where the Company does not file Tax Returns that it is or may be subject to taxation by that jurisdiction, which claim has not been finally resolved.

(d) The Company has withheld and paid all Taxes required to have been withheld and paid by it in connection with amounts paid or owing by the Company to any Employee, Consultant, creditor, stockholder or other party. The Company has timely and correctly completed and filed all applicable reports and forms with respect to all services providers to the Company (including all appropriate IRS Form W-2, IRS Forms 1099, or similar Belgian Tax forms (including fee forms relating to secret commission payments), as applicable).

(e) The Company is duly registered for purposes of VAT and has duly, timely and properly complied in all respects with the applicable VAT legislation (including, but not limited to, the timely filing of tax returns and payment of VAT due).

(f) No deficiencies for any Taxes have been proposed or assessed in writing against or with respect to any Taxes due by, or Tax Returns of, the Company, which deficiencies have not been finally resolved, and there is no outstanding audit, assessment, dispute or claim concerning any Tax Liability of the Company either within the Seller's Knowledge or claimed, pending or raised by an authority in writing, which audit, assessment, dispute or claim has not been finally resolved.

(g) The Company (i) is not nor has it ever been a member of an affiliated group (other than a group the common parent of which is Company) or concluded a group contribution agreement with any other company within the meaning of Article 205/5 of the Belgian Income Tax Code 1992 and (ii) has no Liability for Taxes of any Person arising from the application of Treasury Regulation Section 1.1502-6 or any analogous provision of state, local or foreign (including Belgian) Tax Law, or as a transferee or successor, by Contract, or otherwise.

(h) The Company is not part of a fiscal unity (for VAT or income tax purposes) at Closing.

(i) The Company has not been a United States real property holding corporation within the meaning of Section 897(c)(2) of the Code during the applicable period specified in Section 897(c)(1)(A)(ii) of the Code. The Company does not and has never owned any stock or other equity interest in any Person that is or was treated as a "passive foreign investment company" within the meaning of Section 1297 of the Code. The Company is not and has never been a "controlled foreign corporation (within the meaning of Section 957 of the Code) nor a "passive foreign investment company" (within the meaning of Section 1297 of the Code).

(j) Within the last two years, the Company has not distributed stock of another Person, nor, to the Company's Knowledge, has its stock been distributed by another Person, in a transaction that was purported or intended to be governed in whole or in part by Section 355 or Section 361 of the Code.

(k) The Company has delivered to Buyer correct and complete copies of all Belgian income Tax Returns and all examination reports and statements of deficiencies filed, or assessed against and agreed to, by the Company with respect to Taxes for all taxable periods ending on or prior to the Closing Date. The Company has never had a permanent establishment in any country other than Belgium. The Company does not engage in nor has it ever engaged in a trade or business within the United States (as defined for U.S. federal tax purposes), and the Company does not engage in nor has it ever engaged in any activities in any country other than Belgium which would cause the Company to be obligated to pay Taxes or file Tax Returns in such country or jurisdiction.

(a) The Company has at all times since its formation been validly and properly classified for U.S. federal tax purposes as a foreign corporation (as defied pursuant to the Code).

(a) Section 4.9(m) of the Disclosure Schedule lists all jurisdictions (whether foreign or domestic) in which the Company pays Taxes or files Tax Returns and the nature of the Taxes, if any, paid in such jurisdictions by the Company.

(b) All Taxes (including sales tax, use tax and value-added tax) that were required to be collected or self-assessed by the Company have been duly collected or self-assessed, and all such amounts that were required to be remitted to any Taxing Authority have been duly remitted, and the Company has complied with all reporting requirements with respect thereto.

(c) The Company is not and has never been a party to a transaction or agreement that is in conflict with the Tax rules on transfer pricing in any relevant jurisdiction. The transactions entered into by the Company were, to the Seller's Knowledge, entered into under at arm's length terms and conditions.

(d) The Company has not granted or paid any abnormal or benevolent advantage to any of its shareholders or any other party, nor has the Company benefited from any such advantages or commissions granted or paid by any other party. The Company does not have any liability for Tax of any Person other than itself.

(e) The Company has not participated, in any way, in any transaction, scheme or arrangement of which may have intended or has the effect to avoid or evade any liability relating to Tax.

(f) The Company is not a party to any agreement or arrangement with any Taxing Authority or any other Governmental Authority (including but not limited to "Belgian rulings"), and is not subject to a special regime in relation to Taxes.

(g) The Company has submitted all required quarterly declarations to the Belgium National Social Security Office and has paid social security contributions on the basis of all such submitted declarations.

(h) The Company is not obligated or bound by, nor is party to, any Tax Sharing Agreements.

4.10 Employee Benefits and Labor Matters.

(a) Plans and Arrangements. Section 4.10(a) of the Disclosure Schedule sets forth a true and complete list of all Company Plans.

(b) Plan Documents. With respect to each Company Plan, the Company has delivered to Buyer a current, accurate and complete copy thereof (including amendments) or a copy of the representative form agreement thereof and, to the extent applicable, true and complete copies of the following documents with respect to each Company Plan: (i) any Contracts or agreements, plans and related trust documents, insurance Contracts or other funding arrangements, in each case as currently in effect, and all amendments thereto; (ii) all material correspondence, rulings or opinions issued by any Governmental Authority and all material correspondence from the Company to any Governmental Authority other than routine reports, returns or other filings since the Reference Date; and (iii) written descriptions of all non-written Company Plans.

(c) Contributions to Plans. All contributions required to have been made under any of the Company Plans or by Law have been timely made. There are no unfunded liabilities or benefits under any Company Plans that are not reflected in the Financial Statements.

(d) Conformity with Laws. All Company Plans have been established, operated and maintained in accordance with their terms and in material compliance with applicable provisions of Belgian Laws. All amendments and actions required to bring the Company Plans into conformity in all material respects with all of the applicable provisions of Belgian Laws have been made or taken, except to the extent that such amendments or actions are not required by Law to be made or taken until a date after the Closing. There are no pending Actions arising from or relating to the Company Plans (other than routine benefit claims), nor does the Company have any Knowledge of facts that could form or could reasonably be expected to form the basis for any such Action. There are no filings or applications pending with respect to the Company Plans with any Governmental Authority.

(e) Leased Employees. The Company has no Employees who are "leased employees" (as that term is defined in Section 414(n) of the Code) and has no liability, contingent or otherwise, for any federal, state or local workers' compensation contribution, with respect to any Employees who are leased employees.

(f) Employment Matters.

(i) Section 4.10(f)(i) of the Disclosure Schedule sets forth a true and complete listing of the Current Employees and the Current Consultants, as on the Closing Date, including each such person's name, job title or function and job location, as well as a true, correct and complete listing of his or her current salary or wage payable by the Company, and for each such Current Employee or such Current Consultant, the amount of all incentive compensation paid or payable to such person for the current calendar year, the amount of accrued but unused paid time off, description and amount of any material fringe benefits and each such Current Employee's or such Current Consultant's current status (as to leave or disability status and full time or part time, exempt or nonexempt and temporary or permanent status and as to classification as an employee, consultant, independent contractor, officer or director). Other than as fully reflected or specifically reserved against in accordance with GAAP in the Financial Statements (or as otherwise expressly permitted or required pursuant to this Agreement), neither the Company nor Seller has paid or promised to pay any bonuses, commissions or incentives to any Employee or Consultant. The Company has delivered to Buyer a true and complete copy of the employee handbook for the Company, if any and all other employment policies, if any, currently applicable to any Current Employee or Current Consultant.

(ii) To the Company's Knowledge, no Current Consultant or Current Employee at the level of manager or higher has disclosed any plans to terminate his, her or their employment or other relationship with the Company.

(iii) The Company has materially complied with all regulations promulgated by Belgian Governmental Authorities governing the employment of foreign national workers.

(iv) Except as set forth in Section 4.10(f)(iv) of the Disclosure Schedule:

(A) the Company has paid to each applicable Employee the entire amount of the bonus, if any, earned by such Employee for the year ended December 31, 2019 and no remaining bonus amounts for the year ended December 31, 2019, payable to any Employee, remain unpaid as on the Closing Date

(B) since the Reference Date: (x) the Company has paid or made provision for payment of all salaries and wages, which are payable by the Company to any Employees, accrued through the Closing Date and is in compliance in all material respects with Belgian Laws respecting employment and employment practices, terms and conditions of employment, collective bargaining, immigration, wages, hours and benefits, non-discrimination in employment, workers' compensation; and (y) the Company has not been engaged in any unfair employment practice;

(C) since the Reference Date, the Company has not received a written notice, citation, complaint or charge asserting any violation or liability under any applicable (including Belgian) Law regulating employee health and safety;

(D) (u) to the Company's Knowledge, none of the Current Employees is represented by any labor union or other labor representative with respect to his or her employment with the Company; (v) there are no labor, collective bargaining agreements or similar arrangements binding on the Company with respect to any Current Employees; (w) since the Reference Date, no petition has been filed nor has any proceeding been instituted by any Employee or group of Employees with the National Labor Relations Board or similar (including Belgian) Governmental Authority seeking recognition of a collective bargaining agreement; (x) to the Company's Knowledge, there are no Persons attempting to represent or organize or purporting to represent for bargaining purposes any of the Current Employees; (y) since the Reference Date, there has not occurred or, to the Company's Knowledge, has not been threatened any strikes, slowdowns, picketing, work stoppages or concerted refusals to work or other similar labor activities with respect to Employees; and (z) no grievance or arbitration or other proceeding arising out of or under any collective bargaining agreement relating to the Company is pending or, to the Company's Knowledge, threatened;

(E) since the Reference Date, the Company has not received notice of any charge or complaint pending before the Equal Employment Opportunity Commission or similar (including Belgian) Governmental Authority alleging unlawful discrimination in employment practices, or before the National Labor Relations Board or similar (including Belgian) Governmental Authority alleging any unfair labor practice, by the Company, nor, to the Knowledge of the Company, has any such charge been threatened;

(F) (x) all Current Employees of the Company are employed on an at-will basis and their employment can be terminated in accordance with the applicable employment agreements at any time for any reason without any amounts being owed to such individual other than with respect to wages, compensation and benefits accrued before such termination; and (y) the Company's relationships with all individuals who act as Consultants to the Company can be terminated in accordance with the applicable consultancy agreements at any time for any reason without any amounts being owed to such individual other than with respect to compensation or payments accrued before such termination; and

(G) since the Reference Date, the Company has not effectuated: (x) a "plant closing" (as defined in the WARN Act, or any similar (including Belgian) Law) affecting any site of employment or one or more facilities or operating units

within any site of employment or facility of the Company; or (y) a "mass layoff" (as defined in the WARN Act, or any similar (including Belgian) Law) affecting any site of employment or facility of the Company.

(H) any individual performing services for the Company who has been classified as an independent contractor, or as an employee of some other entity whose services are leased to the Company, has been correctly classified and is in fact not a common law employee of the Company or any Subsidiary.

(g) Effect of Transaction. Other than as set out in this Agreement, neither the execution and delivery of the Transaction Agreements nor the consummation of the Transactions shall result in (i) any payment becoming due to any Employee, (ii) the provision of any benefits to any Employee, (iii) the increase, acceleration or provision of any payments, benefits or other rights to any Employee, whether or not any such payment, right or benefit would constitute a "parachute payment" within the meaning of Section 280G of the Code, (iv) require any contributions or payments to fund any obligations under any Company Plan, or (v) the forgiveness in whole or in part of any outstanding loans made by the Company to any Person. No payment, right or benefit that becomes due or accelerated as a result of the execution and delivery of this Agreement or the consummation of the Transactions is an "excess parachute payment" within the meaning of Section 280G of the Code.

(h) Plans Outside the United States. No Company Plan is subject to the laws of any jurisdiction other than Belgium.

(i) Plan Termination. Each Company Plan can be amended, terminated or otherwise discontinued in accordance with its terms, without Liability to the Company, Buyer or any of their Affiliates (other than ordinary administrative expenses typically incurred in a termination event). Other than as set out in this Agreement, neither the Company nor any of its Affiliates has announced its intention to modify or amend any Company Plan or adopt any arrangement or program which, once established, would come within the meaning of a Company Plan, and each asset held under any Company Plan may be liquidated or terminated without the imposition of any redemption fee, surrender charge or comparable Liability.

4.11 Environmental Matters. The Company is, and at all times has been, in material compliance with all applicable Environmental Laws. There is no Action relating to or arising under applicable Environmental Laws that is pending or, to the Knowledge of the Company, threatened against or affecting the Company or any real property or premises currently owned, operated or leased by the Company. The Company has not received any notice of, or entered into, or assumed by Contract or operation of Law, any obligation, liability, order, settlement, judgment, injunction or decree relating to or arising under applicable Environmental Laws. To the Knowledge of the Company, there are no facts, circumstances or conditions existing with respect to the Company or any real property or premises currently owned, operated or leased by the Company or any property or facility to or at which the Company transported or arranged for the disposal or treatment of Hazardous Materials that could reasonably be expected to result in the Company incurring any Environmental Liability. The Company has not stored, treated, disposed of, arranged for or permitted the disposal of, transported, handled or released any substance (including any Hazardous Materials) or owned, occupied or operated any Premises or property in a manner that has given or could give rise to any Liabilities (including any Liabilities for response costs, corrective action costs, personal injury, natural resource damages, property damage, or any investigative, corrective or remedial obligations) pursuant to any Environmental Laws. The Company has delivered to Buyer a true and complete list of environmental reports, audits assessments and investigations in the Company's possession or control which relate to the Premises and the real property in the Company's possession or control. There have been no Releases at any real property and there are no above-ground, nor to the Company's Knowledge, underground, storage tanks, oil/water separators, sumps, septic systems, or polychlorinated biphenyls (PCBs) or any PCB-containing equipment located on any real property.

4.12 Contracts.

(a) Specified Material Contracts. Except as set forth in Section 4.12(a) of the Disclosure Schedule, the Company is not a party to, does not have any obligations, rights or benefits under and none of its assets or properties are bound by any:

(i) Contracts that purport to limit, curtail or restrict the ability of the Company or its Affiliates to conduct business in any geographic area or line of business or restrict the Persons with whom the Company or any of its future Subsidiaries or Affiliates may do business;

(ii) Contracts: (x) with any Employee and any offer letters for employment or consulting with the Company, that (A) provide for anticipated annual compensation or other payments in excess of USD$50,000 for any individual (other than employment offers terminable at will with no severance or acceleration liability), including any Contracts with individuals providing for any commission-based compensation in excess of such amount, (B) provide for the payment of non-qualified deferred compensation subject to Section 409A of the Code, or (C) provide for potential severance payments or other severance benefits; and (y) with any Consultant and any offer letters to enter into consulting agreements with the Company, that provide for anticipated annual payments in excess of USD$50,000 for any individual, including any Contracts with individuals providing for any

commission-based payments in excess of such amount;

(iii) Contracts with any labor union or other labor representative of Employees (including any collective bargaining agreement);

(iv) Contracts with any present or former director or stockholder of the Company, or any Affiliate of such director or stockholder (other than Company Plans, but specifically including any employment agreements that are not terminable at will without severance or acceleration liability), including, but not limited to, any agreement providing for furnishing of services by, rental of assets from or to, or otherwise requiring payments to, any such director, stockholder or Affiliate, in each case, other than advances or reimbursements for travel and entertainment expenses consistent with the Company's policy and past practice;

(v) Contracts under which the Company has advanced or loaned any money to any of the Employees or Affiliates of the Company where there is still an outstanding amount due to the Company under such Contract, other than advances or reimbursements for travel and entertainment expenses consistent with the Company's policy and past practice;

(vi) Contracts granting any power of attorney with respect to the affairs of the Company or otherwise conferring agency or other power or authority to bind the Company other than to officers and attorneys in the Ordinary Course of Business;

(vii) Partnership or joint venture agreements;

(viii) Contracts for the acquisition, sale or lease of properties or assets (including any ownership interest in any entity) other than in the Ordinary Course of Business;

(ix) Contracts with a Governmental Authority;

(x) Loan or credit agreements, indentures, notes or other Contracts evidencing indebtedness for borrowed money (contingent or otherwise) by the Company, or any Contracts pursuant to which indebtedness for borrowed money (contingent or otherwise) is guaranteed by the Company, or any guarantees of the foregoing by third parties for the Company's benefit;

(xi) Mortgages, pledges, security agreements, deeds of trust or other Contracts granting a Lien other than Permitted Lien on any material property or assets of the Company;

(xii) Voting agreements or registration rights agreements relating to Company Capital Stock to which the Company is a party;

(i) Lease or rental Contracts relating to personal property requiring aggregate payments by the Company of at least USD$10,000;

(i) Contracts providing for indemnification by the Company other than (x) customary indemnities against breach of the obligations contained in such Contract that were entered into in the Ordinary Course of Business and (y) customary indemnities against infringement of Intellectual Property Rights contained in non-exclusive licenses entered into in the Ordinary Course of Business;

(ii) Any Contract with any supplier or provider of goods or services that are incorporated into, or related to the development of, any Product and Service involving consideration in excess of USD$10,000 in the current or either of the two (2) previous fiscal years (other than purchase orders for goods entered into in the Ordinary Course of Business);

(iii) Any Contracts to (x) provide services to any Person involving consideration in excess of USD$10,000 in the current or either of the two (2) previous fiscal years, or (y) perform any service or sell or lease any product which grants the other party or any third party "most favored nation" status, "most favored customer" pricing, preferred pricing, exclusive sales, distribution, marketing or other exclusive rights, or rights of first refusal or rights of first negotiation;

(iv) Contracts related to the manufacturing, transport, transfer, distribution or storage of any Product and Service involving consideration in excess of USD$10,000 in the current or either of the two (2) previous fiscal years;

(v) Contracts relating to capital expenditures and involving obligations after the Closing Date in excess of USD$10,000 and not cancelable without penalty;

(vi) Contracts relating to the disposition or acquisition of material assets or any ownership interest in any

entity;

(vii) Contracts with any Person, including any financial advisor, broker, finder, investment banker or other Person, providing advisory services to the Company in connection with the Transactions;

(viii) Contracts (other than as set forth above) that are material to the Company's Products and Services or business; and

(ix) Contracts to enter into or negotiate the entering into of any of the foregoing.

(b) Documentation. The Company has delivered to Buyer (i) true and complete copies of each written Material Contract and (ii) a short description of each oral Material Contract, together with any and all amendments, supplements and "side letters" thereto.

(c) Status of Material Contracts. Each of the Contracts required to be listed in Section 4.12(a) of the Disclosure Schedule, each of the Real Property Leases and each of the IP Contracts (collectively, the "Material Contracts") is valid and binding on the Company and in full force and effect and is enforceable in accordance with its terms by the Company. The Company is not in breach or default under any Material Contract, nor, to the Company's Knowledge, does any condition exist that, with notice or lapse of time or both, would constitute a breach or default in any respect thereunder by the Company or that would result in liability to the Company. To the Knowledge of the Company, (i) no other party to any Material Contract is in default thereunder and (ii) no condition exists that with notice or lapse of time or both would constitute a default in any respect by any such other party thereunder. The Company has not received notice of any termination or cancellation of any Material Contract, and to the Company's Knowledge, no other party to a Material Contract has plans to terminate or cancel such Material Contract. The Company has not and, to the Knowledge of the Company, no other party to any Material Contract has repudiated any provision of any Material Contract. The Company is not disputing and, to the Knowledge of the Company, no other party to such Material Contract is disputing, any provision of any Material Contract. None of the parties to any Material Contract is renegotiating any amounts paid or payable to or by the Company under such Material Contract or any other term or provision thereof.

4.13 Assets: Title, Sufficiency, Condition. The Company has good, valid and sufficient title to or sole and exclusive leasehold interest in or adequate right to use all of its assets whether real or personal, tangible or intangible, including those that are used in the conduct of the Business, located on the Company's Premises or reflected in the Balance Sheet as being owned by the Company or acquired after the date thereof (other than inventory disposed of in the Ordinary Course of Business since the date of the Balance Sheet) (the "Assets"), free and clear of all Liens except Permitted Liens. The Assets constitute, in all material respects, all of the assets, properties and rights of every type and description that are used in and necessary for the conduct of the Company's business as currently conducted or proposed to be conducted. All of the material fixtures and other material improvements to the Leased Real Property and all of the tangible personal property (i) are in all material respects adequate and suitable for their present uses, (ii) in good working order, operating condition and state of repair (ordinary wear and tear excepted) and (iii) have been maintained in all respects in accordance with normal industry practice.

4.14 Real Property.

(a) Section 4.14(a) of the Disclosure Schedule (i) sets forth a list of the addresses of all real property leased, subleased or licensed by or for which a right to use or occupy has been granted to the Company (the "Leased Real Property"), and (ii) identifies, with respect to each Leased Real Property, each lease, sublease or other Contract under which such Leased Real Property is occupied or used, including the date of and legal name of each of the parties to such lease, sublease or other Contract and each amendment, modification, supplement or restatement thereto (the "Real Property Leases").

(b) The Company does not own, and has never owned, any real property.

(c) There are no written or oral leases, subleases, licenses, concessions, occupancy agreements or other Contracts granting to any other Person the right to use or occupancy of any of the Leased Real Property and there is no Person (other than the Company) in possession of any of the Leased Real Property. With respect to each Real Property Lease that is a sublease, to the Company's Knowledge, the warranties in this Section 4.14 and Section 4.12(c) are true and correct with respect to the underlying lease.

(d) The Company has delivered to Buyer true, accurate and complete copies of the Real Property Leases, in each case as amended or otherwise modified and in effect, together with any extension notices and other material correspondence, lease summaries, notices or memoranda of lease, estoppel certificates and subordination, non-disturbance and attornment agreements related thereto and no Real Property Lease has been modified in any material respect, except to the extent that such modifications are disclosed in the Disclosure Schedule. With respect to each of the Real Property Leases, (i) the Company has a valid and enforceable

leasehold interest in each parcel or tract of real property leased by it, free and clear of all Liens (including liens arising out of any attachment, judgement or execution) affecting the Leased Real Property or the estate or interest created by the Real Property Leases except for the Permitted Liens; (ii) there are no existing defaults thereunder by the Company or any other party to the Real Property Leases; (iii) to the Company's Knowledge, no event has occurred which (with notice, lapse of time or both) would constitute a breach or default thereunder by the Company or any other party to the Real Property Leases, or that could permit the termination, modification, or acceleration of rent thereunder; (iv) there are no pending disputes, actions or proceedings that were brought by the Company against a lessor under a Real Property Lease alleging that such lessor is in default or has committed a breach under such Real Property Lease; (v) the Company has not received any notice from any Governmental Authority of a violation of any governmental requirements (including applicable Environmental Laws) with respect to any of the Leased Real Property and to the Company's Knowledge, the Leased Real Property is not in violation of any material requirements of same; and (vi) the Company has not used, generated, stored, released, discharged, transported, handled, or disposed of any hazardous materials on, in or in connection with any parcel of Leased Real Property except as expressly permitted pursuant to the terms of the Real Property Leases.

(e) No eminent domain, condemnation or zoning, building code or other moratorium Action is pending or, to the Company's Knowledge, threatened, that would preclude or materially impair the use of any Leased Real Property. None of the Company's current uses of the Leased Real Property violates in any material respect any restrictive covenant or zoning ordinance that affects any of the Leased Real Property. There have been no special assessments filed, or, to the Company's Knowledge, proposed against the Leased Real Property or any portion thereof. None of the Leased Real Property has been damaged or destroyed by fire or other casualty.

(f) All Premises are supplied with utilities and other services necessary for the operation of such Premises as the same are currently operated or currently proposed to be operated, all of which utilities and other services are provided via public roads or via irrevocable appurtenant easements benefitting the parcel of Leased Real Property on which such Premises is located, in each case, to the extent necessary for the conduct of the Company's business.

4.15 Intellectual Property; Technology; Privacy and Security; Information Systems; Disaster Recovery.

(a) Company Intellectual Property Rights and Company Technology.

(i) The Company owns or has the right to use all Company Technology and all Intellectual Property Rights therein to the extent necessary to the Company's business as presently conducted. Except for (x) the Technology and Intellectual Property Rights licensed to the Company under the Inbound IP Contracts and (y) off the shelf, "click wrap" or "shrink wrap" license agreements for software that is generally commercially available to the public on reasonable terms ("Shrink Wrap Licenses"), none of the Company Technology or Company Intellectual Property Rights is owned by any third party. The Company exclusively owns all Company Technology, including Proprietary Software and all Company Intellectual Property Rights that are owned or purported to be owned by the Company free and clear of all Liens other than with respect to the Permitted Liens, including Proprietary Software.

(ii) Section 4.15(a)(ii) of the Disclosure Schedule contains a list and description of Proprietary Software. Except as disclosed by Section 4.15(a)(ii) of the Disclosure Schedule: (o) Proprietary Software is not subject to any contractual limitations as to transfer, assignment, or change of control; (p) the Company has maintained and protected all Proprietary Software (including all source code and system specifications) with appropriate proprietary notices, confidentiality and non-disclosure agreements (where the foregoing would be required by law in order to maintain legal protection of the Company's Intellectual Property Rights in such Proprietary Software) and such other measures as are reasonably necessary to protect the Intellectual Property Rights contained therein or relating thereto, and none of the source code of any Proprietary Software has been published, disclosed or delivered to any Person by the Company (other than as listed on Section 4.15(a)(ii) of the Disclosure Schedule) or by any employee, consultant, contractor or agent of the Company; (q) no licenses or rights have been granted by the Company to any Person to access, use or distribute any source code of any Proprietary Software; (r) the Company has copies of all releases or separate versions of all Proprietary Software; (s) the Company has complete and exclusive right, title and interest in and to all Proprietary Software (except as otherwise provided for in this Agreement); (t) the Company has developed the Proprietary Software through its own efforts and for its own account without the aid or use of any consultants, agents, independent contractors or Persons (other than Persons that are Employees); (u) the Proprietary Software includes the current source code and all materials (which may include system documentation, statements of principles of operation and schematics, as well as any pertinent commentary, explanation, program (including compilers), workbenches, tools and higher level (or "proprietary") language actually created, owned or used by the Company for the development, maintenance and implementation thereof), so that a trained computer programmer could (with reasonable assistance from the Company) develop, maintain, support, compile and deploy all releases or separate versions of the same; (w) the Source Code Materials for the Proprietary Software are complete and accurate in all material respects; (x) there are no Contracts in effect with respect to the marketing, distribution or licensing of the Proprietary Software by any other Person; and (y) the Proprietary Software complies in all material respects with all applicable Laws relating to the export or re-export

of the same.

(b) Infringement. Neither (i) the operation of the business of the Company, including as presently conducted, nor (ii) any of the Products and Services or Company Technology has infringed upon, diluted, misappropriated or violated, or to the Company's Knowledge will infringe upon, dilute, misappropriate or violate, any Intellectual Property Rights of any Person. The Company has not received any written charge, complaint, claim, demand or notice alleging infringement, dilution, misappropriation or violation of the Intellectual Property Rights of any Person (including any demand to refrain from using or to license any Intellectual Property Rights of any Person in connection with the conduct of the Company's business). To the Company's Knowledge, no Person has infringed upon, diluted, misappropriated or violated any Company Intellectual Property Rights at any time since the Reference Date. There are no pending or, to the Company's Knowledge, threatened claims against the Company or any facts or circumstances supporting a claim challenging the Company's ownership of the Company Intellectual Property Rights or alleging that any of the Company Intellectual Property Rights are invalid or unenforceable.

(c) Scheduled IP. Section 4.15(c) of the Disclosure Schedule identifies all patents, patent applications, registered trademarks, applications for trademark, domain names, registered design rights and other forms of registered Intellectual Property Rights and applications therefor owned by or exclusively licensed to the Company (collectively, the "Company Registrations"). All Company Registrations have been duly maintained (including the payment of fees) and are not expired, cancelled or abandoned. Section 4.15(c) of the Disclosure Schedule also identifies each trade name, each unregistered trademark, service mark, or trade dress and each unregistered copyright owned or exclusively licensed by the Company that, in each case, is material to the business of the Company.

(d) IP Contracts. Section 4.15(d) of the Disclosure Schedule identifies under separate headings each Contract under which the Company uses or licenses from third parties Company Technology or Company Intellectual Property Rights that are material to the operation of the business of the Company as presently conducted and that any Person besides the Company owns, including Software other than Proprietary Software that is licensed to or used by the Company and is related to Company's business ("Third Party Software") (other than Shrink Wrap Licenses and Public Software) (collectively "Inbound IP Contracts") or under which the Company has granted any Person any right or interest in Company Intellectual Property Rights including any right to use or access any item of the Company Technology (the "Outbound IP Contracts", and together with the Inbound IP Contracts, the "IP Contracts"). Except as provided in the Inbound IP Contracts and Shrink Wrap Licenses, the Company does not owe any royalties or other payments to any Person for the use of any Intellectual Property Rights or Technology. The Company has paid all fees, royalties and other payments applicable to the past and current use or exploitation of Intellectual Property Rights provided for by the Inbound IP Contracts and Shrink Wrap Licenses, and no fees, royalties or other payments provided by the Inbound IP Contracts and Shrink Wrap Licenses will become due pursuant to the terms of such Inbound IP Contracts or Shrink Wrap Licenses, as applicable, as a result of, or attributable to, the Transactions contemplated herein.

(e) Confidentiality and Invention Assignments. The Company has taken reasonable measures to maintain practices designed to ensure the protection of the confidentiality of the Company's confidential information and trade secrets and has required any Employee, Consultant or third party with access, or to whom it has disclosed any trade secret or other similar information that the Company treats as confidential or proprietary, to execute contracts requiring them to maintain the confidentiality of such information and use such information only in accordance with such contracts. All Employees and Consultants of the Company who (i) in the normal course of their duties are involved in the creation of Company Technology that is incorporated in any Product and Service of the Company or (ii) have in fact created any Company Technology that is incorporated in any Product and Service of the Company, have executed contracts that irrevocably assign to the Company on a worldwide royalty-free basis all of such Persons' respective rights, including Intellectual Property Rights relating to such Product and Service. To the Knowledge of the Company, no Employee or Consultant is in violation of any term of any such agreement, including any patent disclosure agreement or other employment contract or any other contract or agreement relating to the relationship of any such Employee or Consultant with the Company.

(f) Open Source Software. [*].

(g) Privacy and Data Security.

(i) [*].

(ii) The Company does not Collect or Use Personal Data from any Person in any manner materially different from the description in the Contracts and privacy policies delivered to Buyer.

(iii) [*].

(iv) [*].

(v) [*].

(vi) [*].

(vii) [*].

(h) Effect of Transactions on Company Technology Rights or Data Privacy. The Transactions shall not adversely affect the Company's ownership of any Company Technology or the Company's legal right and ability to continue using the Company Technology in the operation of the Company's business on or after the Closing to the same extent as the Company Technology is used in the operation of the business prior to the Closing. The Transactions (including any transfer of Personal Data resulting from the Transactions) (i) comply with all Personal Data Obligations of the Company, and (ii) comply (and the disclosure to, transfer to, and use by the Company of such Personal Data after the Closing will comply, assuming all processing activities and Laws remain the same) with all Information Privacy and Security Laws (including any such Laws and regulations in the jurisdictions where the Personal Data is collected). Following the Closing, the Company shall continue to have the right to use such Personal Data on identical terms and conditions as the Company enjoyed immediately prior to the Closing (assuming all processing activities and Laws remain the same).

(i) Information Systems. The Company owns, leases or licenses all Information Systems that are used in, or necessary for, the business of the Company, including the capacity and ability to process current peak volumes in a timely manner. The Information Systems are in reasonably good working condition, and are adequate and have sufficient capacity for the conduct of the Company's business as currently conducted. The Information Systems consist of appropriate infrastructure and capacity as needed for the conduct of the business as presently conducted. In the last twelve (12) months, there have been no material failures, breakdowns, outages or unavailability of such Information Systems. On and after the Closing, the Information Systems shall be in the possession, custody or control of the Company, along with all tools, documentation and other materials relating thereto, as existing immediately prior to the Closing. The Company has taken reasonable measures necessary to ensure that in the case of any disaster or emergency, it is able to (i) resume operations and performance of services promptly and (ii) ensure continued access to all data and information material to the operation of the Company that the Company is required to maintain pursuant to any Contract, communicated internal policy or applicable EU or Belgian Law.

4.16 Insurance. Section 4.16 of the Disclosure Schedule sets forth a list of all policies of property, general liability, directors and officers, fiduciary, employment, title, workers' compensation, environmental, product liability, cyber liability and other forms of insurance maintained by the Company and all pending outstanding claims against such insurance policies. The Company has delivered to Buyer complete and correct copies of all such policies, together with all endorsements, riders and amendments thereto. There are no disputes with the insurers of any such policies or any claims pending under such policies as to which coverage has been reserved, questioned, denied or disputed by the insurers of such policies. Each such policy is in full force and effect, all premiums that are due and payable under all such policies have been paid, the Company is (to the Company's Knowledge) otherwise in compliance in all respects with the terms of such policies, and the Transactions shall not result in any termination of, or otherwise adversely affect, any such policy. The Company has not failed to give proper notice of any claim under any such policy in a valid and timely fashion. The Company has not received any notice of non-renewal, cancellation or termination of any insurance policy in effect on the Closing Date or at any time since the Reference Date.

4.17 Related Party/Affiliate Transactions. Other than as set out in the Disclosure Schedule, (i) there are no Liabilities of the Company to any Related Party other than ordinary course, Employee- and director-related compensation and reimbursement Liabilities, and (ii) no Related Party has any interest in any property (real, personal or mixed, tangible or intangible) used by the Company in the conduct of its business. The Company is not subject to any ongoing transactions pursuant to which the Company purchases any services, products or Technology from, or sells or furnishes any services, products or Technology to, any Related Party. All transactions pursuant to which any Related Party has purchased any services, products or Technology from, or sold or furnished any services, products or technology to, the Company (each a "Related Party Transaction") have been on an arm's-length basis on terms no less favorable to the Company than would be available from an unaffiliated party.

4.18 Suppliers. Section 4.18 of the Disclosure Schedule sets forth lists of the top ten suppliers of the Company (measured in terms of total expenses) attributable to each such Person during the year ended December 31, 2019 (each Person identified on at least one of such lists, a "Top Supplier"), showing the total purchases by the Company from each such Top Supplier during such period. Since the Balance Sheet Date, no Top Supplier has (i) ceased or materially reduced its sales or provision of services to the Company or changed the pricing or other terms of the business it does with the Company, or (ii) to the Knowledge of the Company, threatened to cease or materially reduce such sales or provision of services, other than in the Ordinary Course of Business. No Top Supplier has pending or threatened any Action against the Company.

4.1 Certain Business Practices. Neither the Company nor any Employee, nor to the Company's Knowledge, any agent

acting on behalf of the Company, has (i) used any funds for unlawful contributions, gifts, entertainment or other unlawful payments relating to political activity, (ii) made any unlawful payment to any foreign or domestic government official or employee or to any foreign or domestic political party or campaign or violated any provision of any applicable Law relating to bribery and corruption, (iii) consummated any transaction, made any payment, entered into any Contract or arrangement or taken any other action in violation of Section 1128B(b) of the Social Security Act, as amended, or any equivalent foreign or international (including Belgian) Law, or (iv) made any other unlawful payment of a type similar to those described above in this Section 4.19.

4.2 Brokers and Other Advisors. No broker, investment banker, financial advisor or other Person is entitled to any broker's, finder's, financial advisor's or other similar fee or commission, or the reimbursement of expenses, in connection with the Transactions or any prior actual or potential merger, acquisition or divestiture transaction based upon arrangements made by or on behalf of the Company or any of its Affiliates. Notwithstanding anything in this Agreement to the contrary, there are no fees or expenses related to the Transactions payable by the Company to any third party other than the Company Transaction and Bonus Expenses.

ARTICLE V

REPRESENTATIONS AND WARRANTIES OF BUYER AND BUYER'S GUARANTOR

Buyer and Buyer's Guarantor represent and warrant to Seller as of the Closing Date as follows:

5.1 Organization. Buyer is a company duly incorporated, validly existing and in good standing under the laws of the Netherlands, has its tax residency in the Netherlands and does not have any permanent establishment outside of the Netherlands. Buyer's Guarantor is a corporation duly incorporated, validly existing and in good standing under the laws of the State of Delaware.

5.2 Authority; Non-Contravention.

(a) Buyer and Buyer's Guarantor have all requisite corporate power and corporate authority to execute and deliver the Transaction Agreements to which they are a party and to perform their obligations thereunder and to consummate the Transactions. The execution, delivery and performance by each of Buyer and Buyer's Guarantor of the Transaction Agreements to which they are a party and the consummation by Buyer and Buyer's Guarantor of the Transactions have been duly authorized and approved by Buyer's and Buyer's Guarantor's board of directors and no other corporate action on the part of Buyer or Buyer's Guarantor is necessary to authorize the execution, delivery and performance by Buyer or Buyer's Guarantor of the Transaction Agreements to which they are a party and the consummation by them of the Transactions. This Agreement has been and, when delivered at the Closing, the other Transaction Agreements to which Buyer or Buyer's Guarantor are a party shall be, duly executed and delivered by Buyer or Buyer's Guarantor. Assuming due authorization, execution and delivery hereof and thereof by the other parties hereto and thereto, this Agreement constitutes and the other Transaction Agreements to which Buyer or Buyer's Guarantor are a party shall, when delivered at the Closing, constitute, the legal, valid and binding obligations of Buyer and Buyer's Guarantor, enforceable against Buyer and Buyer's Guarantor in accordance with their respective terms, except to the extent that their enforceability may be limited by applicable bankruptcy, insolvency, reorganization, moratorium, or similar laws affecting the enforcement of creditors' rights generally and by general equitable principles.

(b) Neither the execution and delivery of the Transaction Agreements to which Buyer or Buyer's Guarantor are a party, nor the consummation by Buyer or Buyer's Guarantor of the Transactions, nor compliance by Buyer and Buyer's Guarantor with any of the terms or provisions thereof, shall (i) violate any provision of the Charter Documents of Buyer or Buyer's Guarantor or (ii) assuming that the consents and approvals referred to in Section 5.3 are obtained and the filings referred to in Section 5.3 are made, (x) violate any Law applicable to Buyer or Buyer's Guarantor or any of their properties or assets, or (y) conflict with or constitute a material default under (with or without notice or lapse of time, or both), result in the termination of or cancellation under, or result in the creation of any Lien upon any of the material properties or assets of Buyer or Buyer's Guarantor under, any of the terms, conditions or provisions of any material Contract to which Buyer or Buyer's Guarantor are a party.

5.3 Governmental Approvals. No consent, approval or authorization of, or registration, qualification or filing with, any Governmental Authority is required for the valid execution, delivery and performance of this Agreement or the other Transaction Agreements by Buyer or Buyer's Guarantor of this Agreement or the consummation by Buyer and Buyer's Guarantor of the transactions contemplated hereby, except for (i) a filing with the New York Stock Exchange in respect of the shares of Buyer's Guarantor's Common Stock issuable pursuant to this Agreement and (ii) such consents, approvals, orders, authorizations, registrations, declarations and filings as may be required under applicable federal or state securities laws.

5.4 SEC Documents. Buyer's Guarantor has filed all reports required to be filed by it with the SEC since January 1, 2018, and Buyer's Guarantor has made available to Seller (including through the SEC's EDGAR database) true, correct and complete copies of all such reports (collectively, "Buyer's Guarantor SEC Documents"). As of their respective dates, each of the Buyer's Guarantor SEC Documents complied in all material respects with the applicable requirements of the Securities Exchange Act of 1934, as amended (the "1934 Act"), and none of the Buyer's Guarantor SEC Documents, as of their respective dates, contained any untrue statement of a material fact or omitted to state a material fact required to be stated therein or necessary in order to make the statements made therein, in light of the circumstances under which they were made, not misleading.

(a) Each of the consolidated financial statements (including, in each case, any notes thereto) contained in the Buyer's Guarantor SEC Documents was prepared in accordance with U.S. generally accepted accounting principles throughout the periods indicated (except as may be indicated in the notes thereto and except that financial statements included with interim reports do not contain all notes to such financial statements) and each fairly presented in all material respects the consolidated financial position, results of operations and changes in stockholders' equity and cash flows of Buyer's Guarantor and its consolidated subsidiaries as at the respective dates thereof and for the respective periods indicated therein (subject, in the case of unaudited statements, to normal year-end adjustments which are not expected, individually or in the aggregate, to be material).

5.5 Shares of Common Stock. The shares of Buyer's Guarantor's Common Stock to be issued and delivered to Seller in accordance with this Agreement, when so issued and delivered, will be (i) duly authorized, validly issued, fully paid and nonassessable and not subject to preemptive rights created by statute, the Charter Documents of Buyer or Buyer's Guarantor or any agreement to which Buyer or Buyer's Guarantor is a party, and (ii) based in part upon the statements of Seller in Article III, issued pursuant to available and valid exemptions from the registration and qualification provisions of applicable federal and state securities laws.

5.6 Resources. Buyer and Buyer's Guarantor have immediately available the necessary cash resources to meet their respective obligations under this Agreement.

ARTICLE VI

GUARANTEE BY BUYER'S GUARANTOR

1.%2 Buyer's Guarantor, as primary obligor, unconditionally and irrevocably guarantees, by way of continuing guarantee to Seller the payment and performance by Buyer, when due, of all amounts to be paid by Buyer and obligations to be performed by Buyer under this Agreement and the other Transaction Documents. This guarantee shall remain in full force and effect until all such amounts and obligations have been irrevocably paid and discharged in full.

2.%2 Buyer's Guarantor's obligations under this Clause:

(a) constitute direct, primary and unconditional obligations to pay on first demand by Seller any sum which Buyer is liable to pay under this Agreement or any other Transaction Document and to perform on first demand any obligation of Buyer under this Agreement or any other Transaction Document without requiring Seller to first take any steps against Buyer or any other person, as if it were the principal obligor in respect of such payment or obligation; and

(b) shall not be affected by the following:

(i) the taking, variation, renewal or release of, or refusal or neglect to perfect or enforce, any right, remedy or security against Buyer or any other person; or

(ii) any legal limitation, disability or other circumstance relating to Buyer or any unenforceability or invalidity of any obligation of Buyer under this Agreement or any other Transaction Document.

3.%2 Any agreement, waiver, consent or release given by Buyer shall bind Buyer's Guarantor and in references to the "Parties", Buyer and Buyer's Guarantor shall be treated as being a single party with one single interest.

ARTICLE I

CERTAIN AGREEMENTS OF THE PARTIES

1.1 Governmental Authorities. Each of the Parties shall use its commercially reasonable efforts to (i) cooperate with each other in connection with any investigation or other inquiry by or before a Governmental Authority relating to the Transactions,

including any proceeding initiated by a private party and (ii) keep the other Parties informed in all material respects and on a reasonably timely basis of any material communication received by such Party from, or given by such Party to, any Governmental Authority and of any material communication received or given in connection with any proceeding by a private party, in each case regarding any of the Transactions. In furtherance and not in limitation of the covenants of the Parties contained in this Section 7.1, each of the Parties shall use its commercially reasonable efforts to resolve such objections, if any, as may be asserted by a Governmental Authority or other Person with respect to the Transactions.

1.2 Public Announcements. Unless otherwise required by (i) applicable Law, (ii) stock exchange requirements, or (iii) any disclosure made in connection with the enforcement of any right or remedy relating to this Agreement or the transactions contemplated hereunder, no Party to this Agreement shall at any time make any public announcement or disclosure in respect of this Agreement or the transactions contemplated hereby or otherwise communicate with any news media with respect to this Agreement or the transactions contemplated hereby without the prior written consent of the other Parties (which consent shall not be unreasonably withheld or delayed). Any public announcement (other than the public announcements which are required by (i) applicable Law, (ii) stock exchange requirements, or (iii) any disclosure made in connection with the enforcement of any right or remedy relating to this Agreement or the transactions contemplated hereunder) shall be in a form which has been agreed in writing between the Parties.

1.3 Confidentiality. Seller shall, and shall cause Seller's Affiliates and their respective Representatives to, keep confidential all documents and information involving or relating to the Company or its business (the "Confidential Information"), unless (i) compelled to disclose such Confidential Information by Law so long as, to the extent permitted by Law, reasonable prior notice of such disclosure is given to Buyer and the Company and a reasonable opportunity is afforded Buyer and the Company to contest the same or (ii) disclosed in an Action brought by a Party in pursuit of its rights or in the exercise of its remedies hereunder. The provisions of this Section 7.3 shall survive the Closing Date indefinitely.

1.4 Tax Matters.

(a) Seller Prepared Tax Returns. Seller shall, at Seller's sole cost and expense, prepare and timely file (or cause the same to be done), on behalf of the Company all Tax Returns that are due prior to Closing and which relate to any taxable period of the Company ending on and as at the Closing (the "Seller Prepared Tax Returns"). Each Seller Prepared Tax Return shall be prepared in a manner consistent with the past practice of the Company.

(b) Buyer Prepared Tax Returns. Buyer shall prepare or cause to be prepared and file or cause to be filed all Tax Returns of the Company that are due after Closing.

(c) Tax Contests.

(i) After the Closing, each of Buyer, on the one hand, and Seller, on the other hand, shall promptly notify the other Party in writing upon receipt from a Taxing Authority of any written notice of any pending or threatened audit, examination, claim, dispute or controversy relating to Taxes with respect to the Company for a Pre-Closing Tax Period or with respect to which such other Party (or any of its Affiliates) could be liable pursuant to this Agreement; provided, however, the failure to give such notice shall not affect the indemnification provided hereunder except to the extent that the Tax liabilities are materially increased or could not be materially decreased as a result of such failure.

(ii) If Buyer or any Affiliate of Buyer receives notice of any Tax audit by a Taxing Authority that relates to the Company with respect to any Pre-Closing Tax Period, Buyer shall use commercially reasonable efforts to inform Seller of such notice; provided, that, the failure to give such notice shall not affect the indemnification provided hereunder except to the extent that the Tax liabilities are materially increased or could not be materially decreased as a result of such failure. With respect to each Tax audit described in the immediately preceding sentence that relates to a Pre-Closing Tax Period, Buyer shall allow Seller the opportunity to elect, solely at Seller's own cost and expense, to control all proceedings in connection with such audit, provided, however, that (x) Seller shall keep Buyer reasonably informed of all material developments regarding such audit, and shall not settle all or any material portion of such tax audit without the written consent of Buyer, which consent shall not be unreasonably withheld, conditioned or delayed, and (y) Buyer and its counsel (at Buyer's expense) may participate in (but not control the conduct of) the defense of such audit.

(iii) With respect to any Tax Claim other than those for which Seller has elected to control as described in the immediately preceding paragraph, Buyer shall control all proceedings in connection with such Tax Claim; provided, however, that to the extent that any such Tax Claim could reasonably be expected to result in Seller being liable hereunder, (x) Buyer shall keep Seller reasonably informed of all material developments regarding such Tax Claim, (y) Seller and Seller's counsel (at Seller's expense) may participate in (but not control the conduct of) the defense of such Tax Claim, and (z) Buyer shall not settle such Tax Claim without the written consent of Seller, which consent shall not be unreasonably withheld, conditioned or delayed.

(i) In the event of any conflict between the provisions of this Section 7.4(c), and the provisions of Section 10.4(a), the provisions of this Section 7.4(c) shall control.

(d) Certification. Buyer and Seller agree, upon request from the other Party, to use their commercially reasonable efforts to obtain any certificate or other document from any Taxing Authority or any other Person as may be necessary to mitigate, reduce or eliminate any Tax that could be imposed (including, but not limited to, with respect to the contemplated Transactions).

(e) Cooperation. Following the Closing Date, Buyer and Seller shall, as reasonably requested by any Party: (i) assist any other Party in preparing and filing any Tax Returns relating to the Company that such other Party is responsible for preparing and filing; (ii) cooperate in preparing for any Tax audit of, or dispute with any Taxing Authority regarding and any judicial or administrative proceeding relating to, liability for Taxes, in the preparation or conduct of litigation or investigation of claims and in connection with the preparation of financial statements or other documents to be filed with any Taxing Authority, in each case with respect to the Company; (iii) make available to the other Parties and to any Taxing Authority as reasonably requested all information, records and documents in its possession relating to Taxes relating to the Company (at the cost and expense of the requesting Party); (iv) provide timely notice to the other Parties in writing of any pending or threatened Tax audits or assessments relating to the Company for taxable periods for which any such other Party is responsible; and (v) furnish the other Parties with copies of all correspondence received from any Taxing Authority in connection with any Tax audit or information request with respect to any taxable periods (or portion thereof) for which any such other Party is responsible. For the avoidance of doubt, the cooperation noted in this Section 7.4(e) shall include signing any Tax Returns, amended Tax Returns, claims or other documents with respect to any audit, litigation or other proceedings with respect to Taxes, the retention and (upon the other Party's reasonable request) the provision of records and information which are reasonably relevant to any such audit, litigation or other proceeding and making employees available on a mutually convenient basis to provide additional information and explanation of any material provided hereunder.

(a) Amended Tax Returns. Buyer shall not cause or permit the Company or any Affiliate of Buyer to amend any Tax Return of or with respect to the Company that relates to Taxes that are subject to indemnification by Seller hereunder without the prior written consent of Seller (which consent shall not be unreasonably withheld, conditioned or delayed); provided, however, that no such consent shall be required for the filing of any Tax Return or an amendment of any Tax Return of the Company that is required by applicable Tax Law.

(b) Transfer Taxes. Seller shall be solely liable for any transfer tax, gains tax, stamp tax, share transfer tax, or other similar Tax imposed as a result of or in connection with the Transactions (collectively, the "Transfer Taxes"). The Parties shall cooperate in filing all necessary Tax Returns and other documentation with respect to the Transfer Taxes.

1.5 Non-Competition, Non-Solicitation and Non-Hire Covenants.

(a) During the Restrictive Term, Seller shall not, and shall cause Seller's Affiliates not to, directly or indirectly, (i) acquire, finance, own any interest in, manage, control, participate in, consult with, render services for, operate or in any manner engage in a Competitive Business, (ii) for the purpose of conducting or engaging in a Competitive Business, call upon, solicit, advise or otherwise do, or attempt to do, business with any clients, suppliers, customers, accounts of the Company, Buyer or any other material business relation of the Company or Buyer, or (iii) otherwise take any action that is designed or intended to have the effect of discouraging any lessor, licensor, customer, supplier or other business relation of the Company or Buyer from maintaining the same business relationships with such Person after the Closing Date as it maintained with such Person prior to the Closing Date; provided, however, that neither Seller nor any of Seller's Affiliates shall be prohibited from owning up to two percent (2%) of the outstanding stock of any Person that is publicly traded on a national securities exchange or in the over-the-counter market so long as Seller or any of Seller's Affiliates has no active participation in the business or management of such Person.

(b) During the Restrictive Term, Seller shall not, and shall cause Seller's Affiliates not to, directly or indirectly, (i) induce or attempt to induce any officer, employee, representative or agent of the Company or Buyer engaged in the Business to leave the employ of the Company or Buyer (provided, that this clause (i) shall not prohibit any Person from making general employment solicitations such as through advertisements in publicly available media so long as such advertisements are not specifically targeted at employees of the Company or Buyer), (ii) hire any Person who was an employee or consultant of the Company at any time during the twelve (12) months prior to the Closing Date or any Person who is otherwise an employee or consultant of the Company or Buyer engaged in the Business during the Restrictive Term, within twelve (12) months following the date of termination of such Person's employment with the Company or Buyer, or (iii) in any other way interfere with the relationship between the Company or Buyer, on the one hand, and any employee thereof engaged in the Business, on the other.

(c) Seller acknowledges and agrees that the length of the covenants set forth in this Section 7.5 are reasonable and

narrowly drawn to impose no greater restraint than is necessary to protect the goodwill of Buyer and, after giving effect to the consummation of the transaction, the Company with respect to the Business.

(d) Buyer and Seller intend that the covenants of this Section 7.5 shall be deemed to be a series of separate covenants, one for each month of the time periods covered by such covenants. For the avoidance of doubt, the covenants of this Section 7.5 shall not survive following the Restrictive Term.

1.6 Release. [*].

1.7 Discharge of Director. Except with respect to any obligation to indemnify pursuant to Article X:

(a) Buyer shall procure that the unconditional and irrevocable discharge to the director (*bestuurder/administrateur*) of the Company who holds office at Closing (including for the avoidance of doubt the resigning director) or, as the case may be, held office prior to Closing (the "Director") for the performance of its duties as director up until Closing is confirmed at the next relevant annual shareholders' meetings or, as the case may be, a meeting of the board of directors or other managing body of the Company;

(b) Buyer shall not bring a Claim or initiate legal proceedings against the Director, in the Director's capacity as the Director, unless such Claim is solely based on fraud (*bedrog/fraude*) of such Director; and

(c) if legal proceedings are initiated against the Director in relation to the performance of his duties as the Director until Closing by a third party, Buyer shall (i) fully and immediately indemnify such Director against any such proceedings unless such proceedings are solely based on fraud (*bedrog/fraude*) of such Director and (ii) ensure that such Director (and its permanent representative) shall continue to be able to seek coverage under any directors' and officers' "tail" liability insurance policy purchased by the Company prior to the Closing.

1.1 Employee Matters and Company Plans. Notwithstanding anything to the contrary set forth in this Agreement, nothing in this Agreement shall be deemed to give rise to any obligation by Buyer to retain any Current Employee, any group of Current Employees of the Company or any Company Plan following the Closing Date.

1.2 Registration of Shares. Buyer agrees to register the Stock Consideration Shares for public resale on a Form S-3ASR pursuant to the registration rights agreement substantially in the form attached hereto as Exhibit B (the " Registration Rights Agreement"). Notwithstanding anything herein to the contrary, following registration of the Stock Consideration Shares, Seller agrees not to sell any shares of Buyer's Guarantor's Common Stock issued to Seller, if the sale of such shares would, when combined with the sale of any other shares of Buyer's Guarantor's Common Stock by Seller in any one (1)-day period, exceed five percent (5%) of the average daily trading volume of Buyer's Guarantor's Common Stock on the New York Stock Exchange over the five (5) trading days preceding such date of sale; provided, however, that if the aggregate number of Stock Consideration Shares represents less than fifty percent (50%) of the average daily trading volume of Buyer's Guarantor's Common Stock on the New York Stock Exchange over the five (5) trading days preceding the Closing, such resale volume limitations shall not apply.

1.3 No subsequent transfer of Shares.

(a) Aside from Buyer's status as the wholly owned subsidiary of Buyer's Guarantor, Buyer shall ensure that it beneficially owns the Shares as from the Closing and will not transfer legal or beneficial ownership of all or part of the Shares to any non-EEA entity within 12 months following the Closing Date (the "Non-Transfer Period"). Without prejudice to the foregoing, Buyer shall not proceed with any transfer of the legal or beneficial ownership of all or part of the Shares during the Non-Transfer Period without the transferee undertaking the same towards Seller.

(b) In case of an actual or deemed breach of Section 7.10(a), Buyer shall indemnify Seller and hold Seller harmless for any damage suffered as a result of such breach (including but not limited to the capital gains tax within the meaning of Article 90, first paragraph, 9° and/or 94 of the Belgian Income Tax Code on the capital gain realized by the Seller in relation to the Shares, the administrative fines, interest, recovery costs and any tax penalties).

ARTICLE II

CLOSING

2.1 Closing Obligations of Buyer . At Closing, Buyer shall do the following or procure the following to be done (hereinafter referred to as the "Buyer's Closing Obligations"):

(a) Payment obligations. Fulfil its payment obligations as set out in Sections 2.1(b)(ii) and 2.3;

(b) Transfer of Shares. Take any action or make any decision required in order to effect and record the transfer of the Shares, including recording the transfer of the Shares in the Company's share register and signing the Company's share register to that effect;

(c) Shareholders' Meeting. Buyer shall hold an extraordinary shareholders' meeting of Company or, as the case may be, a meeting of the board of directors or other managing body (or procure written resolutions to be executed to the extent permitted under applicable Laws) during which, subject to Closing, (i) the resignation of any resigning director is acknowledged, (ii) interim discharge is granted to the Director for the performance of its mandate until Closing, and (iii) new directors/managers of the Company are appointed (as the case may be); and

(d) Deliveries. Make the following deliveries:

(i) the shares of Buyer's Guarantor's Common Stock underlying the Buyer RSU Award Agreements shall be registered, or shall be in the process of being registered with effectiveness prior to delivery of the Buyer RSU Award Agreements, on Form S-8; and

(ii) the Registration Rights Agreement shall have been executed and delivered by Buyer's Guarantor to Seller.

2.2 Closing Obligation of Seller. At Closing, the Seller shall do the following or procure the following to be done (hereinafter referred to as the "Seller's Closing Obligations"):

(a) Transfer of Shares. Take any action or make any decision required in order to effect and record the transfer of the Shares, including recording the transfer of the Shares in the Company's share register and signing the Company's share register to that effect; and

(b) Deliveries. Make the following deliveries:

(i) the applicable IRS Form W-8, property and accurately completed with respect to the Seller, and executed by the Seller, as of the Closing Date;

(i) written statements from the Company's outside legal counsel and any financial advisor, accountant or other Person who provided services to the Company (other than Employees who provided such services only in their capacities as such), or who is otherwise entitled to any compensation from the Company, in connection with services provided with respect to this Agreement or any of the Transactions, setting forth the total amount of unpaid Company Transaction and Bonus Expenses that remain payable to such Person with respect to services rendered through the Closing Date; and

(ii) the Registration Rights Agreement shall have been executed and delivered by Seller to Buyer's Guarantor.

ARTICLE III

POST-CLOSING COVENANTS

3.1 Car Lease; Seller Guarantee; Right of Usufruct. The Parties agree that, following Closing, they will each discuss in good faith the following within a reasonable period of time: (i) continuation of that certain Leasing Agreement, dated as of August 21, 2019, between the Company and Alpha Credit SA/NV; (ii) transfer of certain Joint and Several Guarantee, dated as of August 21, 2019, made by Seller to Alpha Credit SA/NV in order to secure the Company's obligations under the Leasing Agreement described in clause (i); and (iii) the treatment of that certain Verkoop Vruchtgebruik Eerste Verdieping Woning (Sale Usufruct First Floor Home), effective as of September 4, 2029, by and between the Company and Seller, with the intention of relocating to a different office.

3.2 Buyer RSU Award Agreement. Notwithstanding any provision herein to the contrary, the Parties acknowledge that the Buyer RSU Award Agreements will not be delivered at the Closing. Rather, Buyer will ensure that each Continuing Employee will receive within fourteen (14) Business Days following the Closing a duly executed Buyer RSU Award Agreement from Buyer with such Buyer RSU Award Agreements representing, in aggregate, awards for an amount equal to USD$5,000,000 in shares of Buyer's Guarantor's Common Stock as set forth in or contemplated by such Buyer RSU Award Agreements. Without limiting the foregoing: (i) the Parties acknowledge that the form attached as Exhibit A hereto will be modified to the extent necessary to comply with

applicable Law while preserving the intent of such form; and (ii) notwithstanding a grant date that will follow the Closing, the vesting start date for each recipient will be set at the Closing Date.

ARTICLE IV

SURVIVAL AND INDEMNIFICATION

4.1 Survival.

(a) All representations and warranties of the Parties contained in this Agreement or any other Transaction Agreement shall survive the Closing until the date that is eighteen (18) months after the Closing Date (the "General Survival Date"); provided, however, that (i) the Fundamental Representations shall survive until the earlier of six (6) years after the Closing Date and ninety (90) days after the expiration of the statute of limitations applicable to the subject matter thereof, (ii) the Seller Intermediate Warranties shall survive until three (3) years after the Closing Date, and (iii) all of the covenants, agreements and obligations of the Parties contained in this Agreement or any other document, certificate, schedule or instrument delivered or executed in connection herewith that are intended to survive the Closing shall survive the Closing and continue in full force and effect until fully performed (the General Survival Date or the last day of any of the periods specified in clause (i), (ii) and (iii) of this Section 10.1, each alternatively referred to herein as the "Survival Date").

(b) Notwithstanding the foregoing, if a claim or notice with respect to recovery under the indemnification provisions hereof is given in accordance with the terms hereof prior to the applicable Survival Date, the claim and any representations and warranties or covenants underlying such claim, shall continue until such claim is finally resolved pursuant to the terms of this Article X, provided that the Indemnified Person gives notice to the Indemnifying Party specifying in reasonable detail the matter or circumstance which may give rise to a claim as soon as reasonably practicable and in any event with thirty (30) days after the Indemnified Person becomes aware or should have become aware of that matter or circumstance. The Indemnifying Party shall not be liable for any losses in respect of a claim to the extent that they are materially increased, or are not materially reduced, as a result of any failure by the Indemnified Person to give notice as contemplated by this Section 10.1(b). It is the express intent of the Parties that, if an applicable survival period as contemplated by this Section 10.1 is shorter than the statute of limitations that would otherwise apply, then, by contract, the applicable statute of limitations shall be reduced to the survival period contemplated hereby. The Parties further acknowledge that the time periods set forth in this Section 10.1 for the assertion of claims under this Agreement are the result of arms'-length negotiation among the Parties and that they intend for the time period to be enforced as agreed by the Parties.

(c) Notwithstanding anything in this Agreement to the contrary, claims for Intentional Fraud and willful misconduct of Seller shall survive indefinitely.

4.2 Indemnification.

(a) Indemnification by Seller and Buyer.

(i) Subject to the terms, conditions and limitations of this Article X, from and after the Closing Date Seller shall indemnify and hold harmless each Buyer Indemnified Person from and against any Loss which such Buyer Indemnified Person may suffer, sustain or become subject to, as a result of or based upon or arising out of (and whether or not involving a Third Party Claim):

(A) any breach of any of the Seller Warranties (other than the Seller Fundamental Warranties and the Seller Intermediate Warranties);

(B) any breach of any of the Seller Fundamental Warranties;

(C) any breach of any of the Seller Intermediate Warranties;

(D) any errors or omission in the calculations delivered to Buyer pursuant to Section 2.5;

(A) any Intentional Fraud or willful misconduct committed by Seller in connection with the negotiation or execution any of the Transaction Agreements or the consummation of any of the Transactions;

(B) any Taxes of the Company (or for which the Company is responsible) for any Pre-Closing Tax Period (taking into account estimated payments of, and any other amounts creditable against, such Taxes), but only to the extent such Taxes (x) were not included in the computation of the Closing Net Working Capital as finally determined, and (y) do not result

from any action of Buyer on the Closing Date following the Closing; and

(C) any Taxes of Seller for any period.

(ii) Subject to the terms, conditions and limitations of this Article X, Buyer shall indemnify and hold harmless each Seller Indemnified Person from and against any Loss which such Seller Indemnified Person may suffer, sustain or become subject to, as a result of or based upon or arising out of (and whether or not involving a Third Party Claim):

(A) any breach of, or misrepresentation or inaccuracy in any of the representations or warranties made by Buyer in this Agreement; and

(B) any breach of or failure to perform any covenant or agreement of Buyer provided for in this Agreement.

(b) Limitations on Claims. Notwithstanding the foregoing:

(i) With respect to any claim seeking recovery of any Loss under Section 10.2(a)(i)(A) above (i.e., any breach of any of the Seller Warranties other than the Seller Fundamental Warranties and the Seller Intermediate Warranties), other than with respect to any claims arising from any Intentional Fraud or willful misconduct of Seller:

(A) Seller will have no liability for any such Loss until the aggregate amount of all such Losses (together with any Losses under Section 10.2(a)(i)(C) in respect of any Seller Intermediate Warranties) exceeds an amount equal to [*]; and

(A) with respect to any such Losses, Buyer shall only have recourse to the Indemnification Hold-Back Amount, and Seller will not have any Liability for any such Loss to the extent that the Indemnification Hold-Back Amount has been exhausted (including following any reduction thereof pursuant to Section 2.7(c)(ii)).

(ii) With respect to any claim seeking recovery of any Loss under Section 10.2(a)(i)(C) above (i.e., any breach of any of the Seller Intermediate Warranties), other than with respect to any claims arising from any Intentional Fraud or willful misconduct of Seller:

(A) Seller will have no liability for any such Loss until the aggregate amount of all such Losses (together with any Losses under Section 10.2(a)(i)(A) in respect of any Seller Warranties other than the Seller Fundamental Warranties and the Seller Intermediate Warranties) exceeds [*]; and

(A) the aggregate amount of Losses for which Seller shall be liable in respect of the Seller Intermediate Warranties shall be limited to [*], it being understood that, with respect to any such Losses, Buyer shall first only have recourse to the Indemnification Hold-Back Amount, and Seller will not have any Liability for any such Loss to the extent that the Indemnification Hold-Back Amount has not first been exhausted (including following any reduction thereof pursuant to Section 2.7(c)(ii)).

(iii) No Buyer Indemnified Person shall be entitled to recover any Losses under this Article X to the extent the amount of such Losses has actually been recovered by such Buyer Indemnified Person from a Person other than another Party to this Agreement.

(iv) If, in respect of any matter which would otherwise give rise to a claim for indemnification by a Buyer Indemnified Person under this Article X, the Company or Buyer is entitled to claim under any policy of insurance, the amount of insurance monies which the Company or Buyer actually receives shall reduce pro tanto or extinguish, as applicable, that claim.

(v) The Buyer Indemnified Persons shall not be entitled to indemnification with respect to any Losses as a result of or based upon or arising from any claim or Liability to the extent such claim or Liability:

(A) is taken into account in determining the amount of any adjustment to the Upfront Purchase Price in accordance with Section 2.7;

(B) [*];

(C) [*]; or

(D) [*].

(vi) If any Indemnifying Party makes any indemnification payment pursuant to this Article X or otherwise by reason of the transactions contemplated hereby under any theory of recovery, such Indemnifying Party shall be subrogated, to the extent of such payment and to the extent permitted by applicable Law, to any rights and remedies of the Indemnified Person to recoup such amounts from third parties with respect to the matters giving rise to indemnification hereunder. Notwithstanding anything in this Agreement to the contrary, however, Seller shall not be subrogated to any rights or remedies, or otherwise make any claim against the Company or any other Buyer Indemnified Person (regardless of the facts or the kind of Loss at issue), and Seller expressly waives any right of subrogation, contribution, advancement, indemnification or other claim against the Company or any other Buyer Indemnified Person with respect to any indemnification obligation or any other liability to which Seller may become subject under or in connection with this Agreement.

(vii) Any payment made by the Seller in respect of a claim pursuant to this Article X shall be deemed to be a reduction in the Final Purchase Price paid by the Buyer.

(viii) The aggregate amount of Losses for which Seller shall be liable pursuant to this Agreement shall be the amount of the Final Purchase Price actually received by Seller (with shares of Buyer's Guarantor's Common Stock deemed, for this purpose, to have a value equal to the Trailing Average Share Price); provided, however, that such limit shall not apply to Seller in the instance of any Intentional Fraud or willful misconduct of Seller. For the avoidance of doubt, with respect to any such Losses, Buyer shall first only have recourse to the Indemnification Hold-Back Amount, and Seller will not have any Liability for any such Loss to the extent that the Indemnification Hold-Back Amount has not first been exhausted (including following any reduction thereof pursuant to Section 2.7(c)(ii)).

(a) [*].

(b) Acknowledgements by Buyer. Buyer acknowledges and agrees that:

(i) other than with respect to Seller's agreement to perform the covenants of Seller as set forth herein, the Seller Warranties are the only representations, warranties or other assurances of any kind given by or on behalf of the Sellers and on which Buyer may rely in entering into this Agreement;

(ii) [*]; and

(iii) whenever a representation or warranty is made specifically concerning a certain matter, such specific matter shall be deemed excluded from the scope of more general representations and warranties dealing with the same subject matter.

(iv) Duty to Mitigate. Nothing in this Agreement shall relieve Buyer from its duty under applicable Law to mitigate any Loss incurred by it or the Company as a result of any matter or circumstance giving rise to a claim. [*].

(v) [*].

4.3 Offset Right.

(a) Offset Right. Without limiting any other remedies of the Buyer Indemnified Persons, from and after the Closing Date, and subject to the limitations set forth in this Article X, the Buyer Indemnified Persons shall be entitled to recover (the "Offset Right") against the Indemnification Hold-Back Amount (to the extent any amount remains at the time the Buyer Indemnified Persons seek to exercise the Offset Right) the amount of any Losses as to which Seller is obligated to indemnify and hold the Buyer Indemnified Persons harmless from under Section 10.2(a).

(b) Exercise of Offset Right. To exercise the Offset Right, Buyer shall (on behalf of Buyer or any other Buyer Indemnified Persons at issue), prior to the Indemnification Hold-Back Payment Date, deliver to Seller at the notice address set forth in Section 11.2 (as the same may be amended from time to time as provided therein and including all Persons to be copied on any notice to Seller), a certificate signed by Buyer (an "Offset Certificate"): (i) stating in good faith that one or more of the Buyer Indemnified Persons has suffered, sustained or become subject to Losses which are entitled to be recovered pursuant to the Offset Right (the "Stated Damages"); and (ii) specifying to the extent practicable in reasonable detail the individual items of Stated Damages and the nature of the breach or other circumstance to which each such item is related. Upon the timely delivery of an Offset Certificate stating a bona fide claim for Stated Damages, any distribution of the Indemnification Hold-Back Shares shall be stayed to the extent of the Stated Damages (subject to the limitations set forth in this Article X) until the resolution of any dispute with respect to the Stated Damages pursuant to this Section 10.3 and Section 10.4, at which time the Indemnification Hold-Back

Shares to which Seller is entitled following the resolution of such dispute shall be issued to Seller pursuant to Section 2.1(b)(iv).

(c) Perfection of Offset Right. After the expiration of a period of thirty (30) days following the time of delivery of an Offset Certificate to Seller, the Offset Right shall be deemed perfected as to the applicable Stated Damages and the Indemnification Hold-Back Amount shall be reduced by an equal amount unless, prior to the expiration of such thirty (30) day period, Seller objects in a written statement delivered to Buyer to the claims made in the Offset Certificate, setting forth in reasonable detail the objections to the claim for Stated Damages.

(d) Objection to Offset Right. If Seller shall timely object in writing to an exercise of the Offset Right by Buyer, Seller and Buyer shall attempt in good faith to agree upon the rights of the respective Parties with respect to each of such claims within thirty (30) days after such objection. If Seller and Buyer should so agree on a claim, a memorandum setting forth such agreement shall be prepared and signed by such Parties, which shall include a statement of the amount of resulting reduction in the Indemnification Hold-Back Amount (and the corresponding reduction to the number of Indemnification Hold-Back Shares as calculated pursuant to Section 10.3(f)).

(e) Settlement of Offset Right. If no agreement can be reached after good faith negotiation between Seller and Buyer pursuant to Section 10.3(d), either Buyer or Seller may initiate an Action in accordance with Sections 11.15 and 11.16 to resolve such dispute. The decision of any such court or arbitrator as to the validity and amount of any claim in such Offset Certificate shall be binding and conclusive upon the Parties.

(f) [*].

4.4 Claims for Indemnification; Resolution of Conflicts.

(a) Third-Party Claims.

(i) In the event that any Action is instituted, or that any Third Party Claim is asserted, the Indemnified Person seeking indemnification for any related Loss (including a Buyer Indemnified Person seeking indemnification for any related loss through an Offset Right) shall notify the Indemnifying Party of any such Action or claim promptly after receiving notice thereof (each, a "Third Party Indemnification Claim Notice"); provided, however, that no delay on the part of the Indemnified Person in giving any such notice shall relieve an Indemnifying Party of any indemnification obligations unless, and only to the extent that, such Losses are materially increased, or are not materially reduced, as a result of any failure by the Indemnified Person to give notice as contemplated by this Section 10.4(a)(i). Subject to the provisions of this Section 10.4(a)(i), and assuming the Indemnified Person does not have the right to elect or does not choose to elect in its Third Party Indemnification Claim Notice to assume the defense of the Third Party Claim in accordance with Section 10.4(a)(v), the Indemnifying Party shall be entitled at its own expense to conduct and control the defense and settlement of such Third Party Claim on behalf of the Indemnified Person through counsel chosen by the Indemnifying Party and reasonably acceptable to the Indemnified Person if the Indemnifying Party notifies the Indemnified Person in writing within thirty (30) days (or sooner, if the nature of the Third Party Claim so requires) of its intent to do so and confirms that the Indemnifying Party shall be obligated to indemnify the Indemnified Person against all resulting Losses. If the Indemnifying Party does not elect within thirty (30) days (or sooner, if the nature of the Third Party Claim so requires) to defend against, negotiate, settle or otherwise deal with any Third Party Claim, the Indemnified Person may defend against, negotiate, settle or otherwise deal with such Third Party Claim with counsel of its choice at the expense of the Indemnifying Party.

(ii) If the Indemnifying Party elects to defend against, negotiate, settle or otherwise deal with any Third Party Claim:

(A) the Indemnifying Party shall use its commercially reasonable efforts to defend such Third Party Claim;

(B) the Indemnified Person, prior to the period in which the Indemnifying Party assumes the defense of such matter, may take such reasonable actions to preserve any and all rights with respect to such matter, without such actions being construed as a waiver of the Indemnified Person's rights to defense and indemnification pursuant to this Agreement and without such actions being determinative of the amount of any indemnifiable Losses, except to the extent the Indemnifying Party's ability to defend such action is actually and materially prejudiced by such actions; and

(C) the Indemnified Person may participate in the defense of such Third Party Claim with separate counsel at its own expense or, if so requested by the Indemnifying Party or, if in the reasonable opinion of counsel to the Indemnified Person, a conflict or potential conflict exists between the Indemnified Person and the Indemnifying Party that would make such separate representation advisable, at the reasonable expense of the Indemnifying Party.

(iii) In connection with this Section 10.4(a), the Parties agree to:

(A) cooperate with each other in connection with the defense, negotiation or settlement of any such Third Party Claim;

(B) make available witnesses in a timely manner to provide testimony through declarations, affidavits, depositions, or at hearing or trial and to work with each other in preparation for such events consistent with deadlines dictated by the particular Third Party Claim;

(C) preserve all documents and things required by litigation hold orders pending with respect to particular Third Party Claims; and

(D) provide such documents and things to each other, consistent with deadlines dictated by a particular matter, as required by legal procedure or court order, or if reasonably requested by another Party hereto;

provided that such cooperation referenced in clauses (A) through (D) shall not be required if it could reasonably be expected to result in a waiver of any attorney-client, work product or other privilege, and provided further that the Parties shall use commercially reasonable efforts to avoid production of confidential information (consistent with Law), and to cause all communications among Employees, counsel and others representing any party to a Third Party Claim to be made so as to preserve any applicable attorney-client or work-product privileges.

(iv) Except as permitted in this Section 10.4(a), the Indemnifying Party shall not, without the written consent of the Indemnified Person(s) (such consent not to be unreasonably conditioned, withheld or delayed), settle or compromise any Third Party Claim or permit a default or consent to entry of any judgment (each a "Settlement"); provided, however, that an Indemnified Person's written consent shall not be required if (x) the claimant provides such Indemnified Person an unqualified release from all liability in respect of the Third Party Claim, (y) such Settlement does not impose any additional liabilities or obligations on the Indemnified Person and (z) with respect to any non-monetary provision of such Settlement, such provisions could not have, or be reasonably expected to have, any adverse effect on the business, assets, financial condition or results of operations of the Indemnified Person and its Subsidiaries, if any. Any Settlement or compromise that does not comply with the preceding sentence shall not be determinative of the amount of Losses with respect to any related claims for indemnification pursuant to this Article X.

(v) Notwithstanding anything in this Agreement to the contrary, if (w) a Third Party Claim seeks relief other than the payment of monetary damages, (x) the subject matter of a Third Party Claim relates to the ongoing business of the Indemnified Person, which Third Party Claim, if decided against the Indemnified Person, could adversely affect the ongoing business of the Indemnified Person, (y) the claim for indemnification relates to or arises in connection with any criminal proceeding, action or indictment, or (z) the Indemnified Person reasonably concludes that the amount of the Third Party Claim and associated defense costs shall exceed the limits on the Indemnifying Party's obligations under Section 10.2(b) or the Indemnifying Party's financial resources available to defend against the Third Party Claim, then, in each such case, the Indemnified Person alone shall be entitled to contest, defend and settle such Third Party Claim. If the Indemnified Person elects to exercise such right to contest, defend and settle such Third Party Claim, then the Indemnified Person shall notify the Indemnifying Party of such election within thirty (30) days of the later of (A) receiving the applicable Third Party Indemnification Claim Notice or (B) the occurrence of the event giving rise to the Indemnified Person's right to make such election pursuant to clause (w), (x), (y) or (z) of this Section 10.4(a)(v). In such event, the Indemnified Person shall instead have the right to be represented by counsel of its choice (of which it shall notify the Indemnifying Party) at the Indemnifying Party's reasonable expense and to defend against, negotiate, settle or otherwise deal with any Third Party Claim. If the Indemnified Person elects to defend against, negotiate, settle or otherwise deal with any Third Party Claim, then (1) the Indemnified Person shall use its commercially reasonable efforts to defend such Third Party Claim, conduct such defense in a good faith and reasonably diligent manner, keep the Indemnifying Party reasonably informed of the status of such defense, and use commercially reasonable efforts to cooperate with the Indemnifying Party with respect to such defense during the course of such defense, and (2) the Indemnifying Party may participate, at its own expense, in the defense of such Third Party Claim. If the Indemnified Person does not elect to contest, defend and settle such Third Party Claim, then the Indemnifying Party shall then have the right to contest, defend and settle such Third Party Claim as described above in Section 10.4(a)(i).

(vi) Notwithstanding the foregoing, any Third Party Claims in respect of Taxes shall be governed by Section 7.4(c) rather than this Section 10.4(a). To the extent that the provisions of this Section 10.4(a) conflict with the provisions of Section 7.4(c), Section 7.4(c) shall control.

(b) Notification of Other Indemnification Claims. In order for a Buyer Indemnified Person to be entitled to any indemnification for claims other than as contemplated or covered by the Offset Right (although, for the avoidance of doubt, a claim tendered pursuant to the Offset Right shall suffice for all purposes even if not covered, or fully covered, by the Offset Right), such Buyer Indemnified Person shall, promptly upon the discovery of the matter giving rise to any Losses, notify Seller in writing of such

Losses specifying in reasonable detail the nature of such Losses and the amounts of liability estimated to accrue therefrom (a "Non-Offset Notice"). The failure to so notify Seller shall not relieve Seller from any liability that Seller may have to Buyer, except to the extent that such Losses are materially increased, or are not materially reduced, as a result of any failure by the Buyer Indemnified Person to give notice as contemplated by this Section 10.4(b). Thereafter, Buyer shall keep Seller reasonably updated with respect to the status of the Losses at issue and the defense thereof. Seller may object to a claim for indemnification set forth in a Non-Offset Notice by delivering a notice to the Buyer Indemnified Person seeking indemnification within thirty (30) days of the delivery of the Non-Offset Notice, setting forth in reasonable detail the objections to the claim. If Seller either notifies the applicable Buyer Indemnified Person that it does not object or does not object in writing by the end of such thirty (30)-day period, such failure to so object shall be an irrevocable acknowledgment that the Buyer Indemnified Person is entitled to the full amount of the claims set forth in such Non-Offset Notice, and Seller shall take all necessary actions under this Agreement to effect payment in respect thereof. If Seller shall timely object in writing to a Non-Offset Notice, Seller and Buyer shall attempt in good faith to agree upon the rights of the respective Parties with respect to such claim within thirty (30) days after such objection. If Seller and Buyer should so agree on a claim, a memorandum setting forth such agreement shall be prepared and signed by Seller and Buyer. If no agreement can be reached after good faith negotiation between Seller and Buyer, either Buyer (or any Buyer Indemnified Person) or Seller may initiate an Action in accordance with Sections 11.15 and 11.16 to resolve such dispute. The decision of any such court as to the validity and amount of any claim in such Non-Offset Notice shall be binding and conclusive upon the Parties.

(c) Claims Unaffected by Investigation. The right of an Indemnified Person to indemnification or to assert or recover on any claim hereunder shall not be affected by any investigation conducted with respect to, or any knowledge acquired or capable of being acquired, at any time, whether before or after the execution and delivery of this Agreement or the Closing, with respect to the accuracy of or compliance with any of the representations, warranties, covenants, or agreements set forth in this Agreement. The waiver of any condition based on the accuracy of any representation or warranty, or on the performance of or compliance with any covenant or agreement, shall not affect the right to indemnification or other remedy based on such representation, warranty, covenant or agreement.

(d) Exclusive Remedy. Subject to Section 11.10 and Section 7.4, and except with respect to (i) Intentional Fraud or willful misconduct of Seller, (ii) as otherwise set forth in this Agreement (including the provisions of Section 2.7), and (iii) the covenants of Seller (including pursuant to Section 7.5), the Parties acknowledge and agree that the remedies provided for in this Article X shall be the Parties' sole and exclusive remedy with respect to any and all claims for any breach, inaccuracy, misrepresentation or nonperformance, as applicable, of any representation, warranty, covenant, agreement or obligation set forth herein or otherwise relating to the subject matter of this Agreement.

(e) Indemnification Adjusts Share Purchase Consideration for Tax Purposes. Each Party shall, including retroactively, treat indemnification payments under this Agreement as well as exercises of the Offset Right as adjustments to the consideration paid in the Transactions for Tax purposes to the extent permitted under applicable Law.

(f) No Subrogation. Seller (on behalf of himself and each Person affiliated with Seller who has served as an officer, director, employee or consultant of the Company) agrees not to make any claim for indemnification against any Buyer Indemnified Person based on the fact that Seller (or any Person affiliated with Seller who has served as an officer, director, employee or consultant of the Company) was a controlling person, director, Employee or agent of the Company (whether such claim is for Losses of any kind or otherwise and whether such claim is pursuant to Law, a Charter Document, a Contract or otherwise) with respect to any claim brought by a Buyer Indemnified Person against Seller (or any Person affiliated with Seller who has served as an officer, director, employee or consultant of the Company) under or relating to this Agreement or any other Transaction Agreement or the Transactions. With respect to any claim brought by a Buyer Indemnified Person against Seller (or any Person affiliated with Seller who has served as an officer, director, employee or consultant of the Company) under or relating to this Agreement, any Transaction Agreement or the Transactions, Seller (on behalf of himself and each Person affiliated with Seller who has served as an officer, director, employee or consultant of the Company) expressly waives any right of subrogation, contribution, advancement, indemnification or other claim against the Company with respect to any indemnification obligation or any other liability to which Seller (or any Person affiliated with Seller who has served as an officer, director, employee or consultant of the Company) may become subject under or in connection with this Agreement.

ARTICLE V

GENERAL PROVISIONS

5.1 Interpretation. The following rules shall apply to the interpretation and construction of the terms and provisions of this Agreement and the other Transaction Agreements:

(a) Provisions.

(i) When a reference is made in this Agreement or another Transaction Agreement to an "Article," "Section," "Exhibit" or "Schedule," such reference shall be to an Article or Section of, or an Exhibit or Schedule to, this Agreement unless otherwise indicated.

(ii) The table of contents and headings contained in this Agreement are for reference purposes only and shall not affect in any way the meaning or interpretation of this Agreement.

(iii) Whenever the words "include," "includes," or "including" are used in this Agreement or any other Transaction Agreement, such words shall be deemed to be followed by the words "without limitation."

(iv) The words "hereof," "herein," and "hereunder" and words of similar import when used in this Agreement refer to this Agreement as a whole and not to any particular provision of this Agreement unless otherwise expressly indicated in the accompanying text.

(v) The use of "or" is not intended to be exclusive unless otherwise expressly indicated in the accompanying text.

(vi) The defined terms contained in this Agreement or any of the other Transaction Agreements are applicable to the singular as well as the plural forms of such terms. Reference to the masculine gender shall be deemed to also refer to the feminine gender and *vice versa*.

(vii) A reference to documents, instruments or agreements also refers to all addenda, exhibits or schedules thereto.

(viii) Any reference to a provision or part of a Law shall include a reference to that provision or part as it may be renumbered or amended from time to time and any successor provision or part or any renumbering or amendment thereof unless otherwise indicated herein.

(ix) References to "deliver," "furnish," "provided" or "made available" means that such documents or information referenced are contained, as of a date which is at least one (1) Business Day prior to the Closing Date, in the Data Room.

(x) This Agreement has been drawn up in English. In the event of any discrepancy between the English text of this Agreement and any translation thereof, the English-language version shall prevail for interpretation purposes.

(xi) References to any Belgian legal concept shall, in respect of any jurisdiction other than Belgium, be deemed to include the concept which in that jurisdiction most closely approximates the Belgian legal concept. References to any United States legal concept shall, in respect of any jurisdiction other than the United States, be deemed to include the concept which in that jurisdiction most closely approximates the United States legal concept.

(xii) When calculating the period of time before which, within which or following which, any act is to be done or step taken pursuant to this Agreement, the date that is the reference date in calculating such period shall be excluded. If the last day of such period is a non-Business Day, the period in question shall end on the next succeeding Business Day. Any period of time mentioned in this Agreement that consists of a number of months or years shall start to run on the day in the relevant month or year on which the triggering event occurs and shall run until the eve of the same day in the relevant month or year (*van de zoveelste tot de dag vóór de zoveelste/de quantième à veille de quantième*).

(xiii) When using the words "shall cause" or any other similar expression, the Parties intend to refer to the Belgian legal concept of *sterkmaking/porte-fort*.

(xiv) References herein to "commercially reasonable efforts" shall refer to those efforts that Persons in the relevant business would generally regard as sufficient to constitute reasonable efforts in the relevant circumstances.

(xv) For the purposes of Section 4.1(a), "good standing" shall mean that the Company has not, and no request is pending for such purpose, (i) been declared bankrupt (*failliet verklaard – déclarée en faillite*) or been annulled; (ii) been granted a temporary or definitive moratorium of payments (*gerechtelijke reorganisatie – réorganisation judiciaire*); (iii) become involved in negotiations with any one or more of its creditors; (iv) been granted terms of payment pursuant to Article 1244 of the Belgian Civil Code or any equivalent or similar measure under the laws of any applicable jurisdiction; (v) been put under judicial administration (*voorlopig bewindvoerder – administrateur provisoire*); or (vi) taken any other action with a view to the readjustment

or rescheduling of all or part of its debts.

(b) No Presumption. The Parties have participated jointly in the negotiation and drafting of this Agreement and, in the event any ambiguity or question of intent or interpretation arises, this Agreement shall be construed as jointly drafted by the Parties and no presumption or burden of proof shall be used to favor or disfavor any Party by virtue of the authorship of any provision of this Agreement.

5.2 Notices. All notices, waivers, consents and other communications to any Party hereunder shall be in writing and shall be deemed given (i) when personally delivered, (ii) when receipt is electronically confirmed, if sent by email of a .pdf document, (iii) one (1) Business Day after deposit with a nationally recognized overnight courier, specifying next day delivery, with proof of receipt or (iv) three (3) Business Days after being sent by registered or certified mail, return receipt requested and postage prepaid, in each case to the Parties at the address, or if applicable, email address following such Party's name below or such other address or email address as such Party may subsequently designate to the other Parties by notice in accordance with this Section 11.2:

If to Buyer or Buyer's Guarantor, to:

Invitae Corporation
1400 16th Street
San Francisco, CA 94103
Attention: Tom Brida, General Counsel
Email:

with a copy (which shall not constitute notice) to:

Pillsbury Winthrop Shaw Pittman LLP
12255 El Camino Real, Suite 300
San Diego, California 92130
Attention: Mike Hird
Email: mike.hird@pillsburylaw.com

If to Seller, to:

Peter Schols
Middelweg 129
3001 Heverlee
Email:

with a copy (which shall not constitute notice) to:

Allen & Overy (Belgium) LLP
Tervurenlaan 268A
1150 Brussels
Attention: Wouter Van De Voorde
Email: Wouter.VanDeVoorde@allenovery.com

5.3 Payment.

(a) Unless otherwise expressly stated (or as otherwise agreed in the case of a given payment), each payment to be made to any Party under this Agreement shall be made in Euro by transfer of the relevant amount into the relevant account on the date (and, if applicable, at or before the time) the payment is due for value on that date and in immediately available funds. The relevant account for a given payment is:

(i) if that payment is to the Seller, to such account as such Seller shall, no less than three (3) Business Days before the date that payment is due, have specified by giving notice to the Buyer for the purpose of that payment;

(ii) if that payment is to the Buyer, to such account as the Buyer shall, no less than three (3) Business Days before the date that payment is due, have specified by giving notice to the Seller for the purpose of that payment.

(b) If a Party defaults in making any payment when due of any sum payable under this Agreement, it shall pay interest on that sum from (and including) the date on which payment is due until (but excluding) the date of actual payment (after, as

well as before judgment) at an annual rate equal to the legal interest rate on that sum, which interest shall accrue from day to day, without compounding.

(c) All payments set forth in this Agreement are denominated in United States Dollars and shall be deemed fully paid by a Party if such Dollar denominated payment amount is made in an amount of Euros calculated using the then-current conversion rate of such Party's bank or other financial institution used (or from which amounts are sourced) to make such payment.

(d) [*].

5.4 Assignment and Succession. Neither this Agreement nor any of the rights, interests or obligations hereunder may be assigned or delegated by any of the Parties without the written consent of the other Parties, except that Buyer may, without the prior consent of any other Party, collaterally assign this Agreement to any lender; provided that no such assignment shall relieve the assigning Party of any of its obligations hereunder and that the Seller may enforce this agreement against the Buyer as if such assignment had not occurred. Any assignment of this Agreement or any of the rights, interests or obligations hereunder not permitted under this Section 11.4 shall be null and void *ab initio*. Subject to the foregoing terms of this Section 11.4, this Agreement shall be binding upon, inure to the benefit of and be enforceable by the Parties and their respective successors and permitted assigns.

5.5 Amendment or Supplement. Subject to the requirements of applicable Law, this Agreement may be amended at any time by execution of an instrument in writing identifying itself as an amendment signed by Buyer and Seller.

5.6 Waivers. No waiver of any provision of this Agreement shall be valid and binding unless it is in writing and signed by the Party against whom the waiver is to be effective. No failure on the part of any Party in exercising any right, privilege or remedy hereunder and no delay on the part of any Party in executing any right, privilege or remedy under this Agreement, shall operate as a waiver thereof, nor shall any single or partial exercise of any such right preclude any other or further exercise thereof or the exercise of any other right hereunder. No notice to or demand on a Party made hereunder shall operate as a waiver of any right of the Party giving such notice or making such demand to take further action without notice or demand as permitted hereunder.

5.7 Entire Agreement. This Agreement, including the Schedules and Exhibits hereto and the other documents referred to herein which form a part hereof, and the Transaction Agreements contain the entire understanding of the Parties with respect to the subject matter contained herein and therein. This Agreement supersedes all prior and contemporaneous, agreements, arrangements, contracts, discussions, negotiations, undertakings and understandings (whether written or oral) between the Parties with respect to such subject matter (other than the Transaction Agreements).

5.8 No Third-Party Beneficiaries. Nothing in this Agreement, express or implied, is intended to or shall confer upon any Person (other than the Parties) any right, benefit or remedy of any nature whatsoever under this Agreement, except that after the Closing, Buyer Indemnified Persons shall be third party beneficiaries for purposes of enforcing the rights granted to such Buyer Indemnified Persons. For the avoidance of doubt, no consent of any Indemnified Person shall be necessary to amend any provision of this Agreement.

5.9 Remedies Cumulative. Except as otherwise provided in this Agreement, all rights and remedies of each of the Parties shall be cumulative and the exercise of any one or more rights or remedies shall not preclude the exercise of any other right or remedy available hereunder or under applicable Law.

5.10 Specific Performance. The Parties agree that each of the Parties would be irreparably harmed if any of the provisions of this Agreement are not performed in accordance with their specific terms and that any breach of this Agreement by the other Parties could not be compensated adequately by monetary damages alone. Accordingly, the Parties agree that, in addition to any other remedy to which such Party may be entitled to at Law or in equity, each Party shall be entitled to temporary, preliminary and/or permanent injunctive relief or injunctions to prevent breaches or threatened breaches of this Agreement and to enforce specifically the terms and provisions of this Agreement (including the right to compel the other Parties to cause the Transactions to be consummated on the terms and subject to conditions set forth in this Agreement) without having to prove irreparable harm or that monetary damages would be inadequate. The Parties expressly waive any requirement under any Law that the other Parties obtain any bond or give any other undertaking in connection with any action seeking injunctive relief or specific performance of any of the provisions of this Agreement. Each of the Parties further agrees that in the event of any action for specific performance relating to this Agreement or the Transactions, such Party shall not assert and hereby waives the defense that a remedy at Law would be adequate or that specific performance is not an appropriate remedy for any reason in Law or equity.

5.11 Severability. If a court of competent jurisdiction finds that any term or provision of the Agreement is invalid, illegal or unenforceable under any Law or public policy, the remaining provisions of the Agreement shall remain in full force and effect if the economic and legal substance of this Agreement and the Transactions shall not be affected in any manner materially adverse to any Party. Any such term or provision found to be illegal, invalid or unenforceable only in part or in degree shall remain in full force and

effect to the extent not invalid, illegal or unenforceable. Upon the determination that any term or provision is invalid, illegal or unenforceable, the Parties intend that such provision shall be construed by modifying or limiting it so as to be valid and enforceable to the maximum extent possible under applicable Law and compatible with the consummation of the Transactions as originally intended.

5.12 Costs and Expenses. Except as otherwise specified herein, whether or not the Transactions are consummated, each Party shall pay all costs and expenses it has incurred in connection with this Agreement and the Transactions, except for [*].

5.13 Counterparts. This Agreement may be executed in several counterparts, each of which shall be deemed an original copy of this Agreement and all of which, when taken together, shall constitute one instrument. The exchange of copies of this Agreement and manually executed signature pages by transmission by email of a .pdf of a handwritten original signature or signatures to the other Parties shall constitute effective execution and delivery of this Agreement and may be used in lieu of the original Agreement for all purposes. The signature of a Party transmitted by email or other electronic means shall be deemed to be an original signature for any purpose.

5.14 Power of Attorney. On the Closing Date, the transfer of the Shares will be recorded in the Company's shareholders' register. The Seller and the Buyer each grant a special power of attorney with the power of substitution to the director of the Company as well as each lawyer of Allen & Overy (Belgium) LLP, each with the power to act alone, in order to record in the name and on behalf of the Seller and the Buyer, the transfer of the Shares in the Company's shareholders' register.

5.15 Governing Law. This Agreement and all claims or causes of action (whether sounding in contract or tort) arising under or related to this Agreement, shall be governed by and construed in accordance with, the Laws of Belgium, without regard to the conflicts of laws rules under these Belgian laws.

5.16 Dispute Resolution. Any dispute arising out of or in relation to this Agreement (including disputes relating to any non-contractual obligations arising out of or in connection with this Agreement) shall be exclusively and finally settled under the CEPANI Rules of Arbitration by one or more arbitrators appointed in accordance with such rules. The arbitral tribunal shall be composed of three arbitrators. The Buyer and the Buyer's Guarantor acknowledge that they have one interest under this Agreement and shall only have the right to one arbitrator between them. The seat of the arbitration shall be Brussels. The arbitration shall be conducted in English. Notwithstanding the foregoing, nothing in this Section 11.16 shall preclude the Parties from applying for injunctive relief in summary proceedings (*kort geding/référé*) before any competent court rather than having recourse to arbitration.

* * *

[*Signature page follows*]

IN WITNESS WHEREOF, the Parties hereto, intending to be legally bound hereby, have caused this Share Purchase Agreement to be duly executed under seal and delivered as of the date first above written.

SELLER:

/s/ Peter Schols

Peter Schols

IN WITNESS WHEREOF, the Parties hereto, intending to be legally bound hereby, have caused this Share Purchase Agreement to be duly executed under seal and delivered as of the date first above written.

BUYER: INVITAE NETHERLANDS, B.V.

By: /s/ Tom Brida
Name: Tom Brida
Title: Director

BUYER'S GUARANTOR: INVITAE CORPORATION

By: __/s/ Sean E. George, Ph.D._____
Name: Sean E. George, Ph.D.
Title: President and Chief Executive Officer

Exhibit 4.1

EXECUTION VERSION

REGISTRATION RIGHTS AGREEMENT

This Registration Rights Agreement (this "**Agreement**") is made and entered into as of March 10, 2020 (the "**Effective Date**") by and between Invitae Corporation, a Delaware corporation (the "**Company**"), and Peter Schols (the "**Seller**").

RECITALS

WHEREAS, the Company, Invitae Netherlands, B.V., an Amsterdam limited liability company (the "**Buyer**") and the Seller have entered into that certain Share Purchase Agreement dated as of March 10, 2020 (the "**Purchase Agreement**"), pursuant to which, on the Effective Date, the Buyer acquired 100% of the issued and outstanding capital stock of Orbicule BV, a Belgian limited liability company operating under the name "Diploid" ("**Diploid**") from the Seller (the "**Share Purchase**");

WHEREAS, in connection with the Share Purchase and pursuant to the Purchase Agreement, the Company (as Buyer's Guarantor and on behalf of Buyer) issued to the Seller at the Closing (as defined in the Purchase Agreement) shares of the Company's common stock, par value $0.0001 per share, identified on Exhibit A hereto as Stock Consideration Shares (the "**Shares**") pursuant to the Purchase Agreement; and

WHEREAS, in connection with the consummation of the transactions contemplated by the Purchase Agreement, the Company (as Buyer's Guarantor and on behalf of Buyer) agreed to grant certain registration rights to the Seller as set forth in this Agreement.

NOW, THEREFORE, in consideration of the mutual covenants and agreements contained herein, the parties agree as follows:

ARTICLE I
DEFINITIONS

Section 1.1 Definitions. For purposes of this Agreement, the following terms and variations thereof have the meanings set forth below:

"**Affiliate**" means, with respect to any person, any other person that, directly or indirectly, controls, or is controlled by, or is under common control with, such person. For this purpose: (a) "control" (including, with its correlative meanings, "controlled by" and "under common control with") means the possession, directly or indirectly, of the power to direct or cause the direction of management or policies of a Person, whether through the ownership of securities or partnership or other ownership interests, by contract or otherwise; and (b) "person" means any natural person, corporation, limited liability company, partnership, association, trust or other entity.

"**Agreement**" has the meaning set forth in the preamble.

"**Business Day**" means any day, other than a Saturday, Sunday or one on which banks are authorized by law to be closed in New York, New York.

"**Company Indemnitee**" has the meaning set forth in Section 4.1(b).

"**Effective Date**" has the meaning set forth in the preamble.

"**Effectiveness Period**" has the meaning set forth in Section 3.1(b).

"**Exchange Act**" means the Securities Exchange Act of 1934.

"**Grace Period**" has the meaning set forth in Section 3.2(h).

"**Holder**" (collectively, "**Holders**") means the Seller and any transferee permitted under Section 3.6, in each case to the extent holding Registrable Securities.

"**Holder Indemnitee**" has the meaning set forth in Section 4.1(a).

"**Indemnified Party**" has the meaning set forth in Section 4.1(c).

"**Indemnifying Party**" has the meaning set forth in Section 4.1(c).

"**Purchase Agreement**" has the meaning set forth in the recitals.

"**Registrable Securities**" means the Shares issued to the Seller pursuant to the Purchase Agreement and any securities issued or issuable upon any stock split, dividend or other distribution, recapitalization or similar event with respect to such securities; provided, however, that Registrable Securities shall cease to be Registrable Securities with respect to a particular Holder when (i) such securities have been disposed of in accordance with the Registration Statement or pursuant to Rule 144; (ii) such securities may be sold pursuant to Rule 144 without any limitation as to manner-of-sale restrictions or volume limitations; or (iii) such securities cease to be outstanding.

"**Registration Expenses**" means all expenses incurred by the Company in effecting the registration pursuant to this Agreement, including all registration and filing fees, printing expenses, fees and disbursements of counsel for the Company, "blue sky" fees and expenses, and expenses of the Company's independent registered public accounting firm in connection with any regular or special reviews or audits incident to or required by any such registration, but shall not include Selling Expenses.

"**Registration Statement**" has the meaning set forth in Section 3.1.

"**Rule 144**" means Rule 144 under the Securities Act or any successor or other similar rule, regulation or interpretation of the SEC that may at any time permit the sale of Registrable Securities to the public without registration.

"**Rule 405**" means Rule 405 under the Securities Act or any successor or other similar rule.

"**Rule 415**" means Rule 415 under the Securities Act or any successor or other similar rule providing for offering securities on a continuous or delayed basis.

"**Rule 424**" means Rule 424 under the Securities Act or any successor or other similar rule.

"**Shares**" has the meaning set forth in the recitals.

"**SEC**" means the Securities and Exchange Commission.

"**Securities Act**" means the Securities Act of 1933.

"**Selling Expenses**" means all discounts, selling commissions, fees of selling brokers, dealer managers and similar securities industry professionals and stock transfer taxes applicable to the sale of Registrable Securities and fees and disbursements of counsel for any Holder (other than the fees and disbursements of counsel for the Company included in Registration Expenses).

"**Transfer**" means, directly or indirectly, to sell, transfer, assign, pledge, encumber, hypothecate or similarly dispose of (by merger, testamentary disposition, operation of law or otherwise), either voluntarily or involuntarily, or to enter into any contract, option or other arrangement or understanding with respect to the sale, transfer, assignment, pledge, encumbrance, hypothecation or similar disposition of (by merger, testamentary disposition, operation of law or otherwise) any Shares.

"**Violation**" has the meaning set forth in Section 4.1(a).

ARTICLE II
TRANSFER RESTRICTIONS

Section 2.1 General Transfer Restrictions. The right of the Seller to Transfer any Shares held by him is subject to the restrictions set forth below.

(a) The Seller acknowledges that the Shares have not been registered under the Securities Act and may not be Transferred except pursuant to an effective registration statement under the Securities Act or pursuant to an exemption from registration under the Securities Act. The Seller covenants that the Shares will only be disposed of pursuant to an effective registration statement under, and in compliance with the requirements of, the Securities Act or pursuant to an available exemption from the registration requirements of the Securities Act, and in compliance with any applicable state and foreign securities laws. In connection with any Transfer of the Shares other than a Transfer (i) pursuant to an effective registration statement, (ii) to the Company or (iii) pursuant to Rule 144, the Company may require the Seller to provide to the Company an opinion

of counsel selected by the Seller and reasonably acceptable to the Company, the form and substance of which opinion shall be reasonably satisfactory to the Company, to the effect that such Transfer does not require registration under the Securities Act.

(b) The Seller agrees to the affixing, so long as is required by this Section 2.1, of the following legend on any certificate or book-entry position evidencing any of the Shares:

THESE SECURITIES HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "ACT"), OR ANY STATE SECURITIES LAWS AND MAY NOT BE TRANSFERRED IN THE ABSENCE OF SUCH REGISTRATION OR AN EXEMPTION THEREFROM UNDER THE ACT AND THE RULES AND REGULATIONS THEREUNDER AND APPLICABLE STATE SECURITIES LAWS.

Certificates or book-entry positions evidencing the Shares shall not be required to contain such legend or any other legend (i) following any sale of such Shares pursuant to an effective registration statement (including the Registration Statement described in Section 3.1) covering the resale of the Shares, (ii) following any sale of such Shares pursuant to Rule 144 or if the Shares are transferrable by a person who is not an Affiliate of the Company or the Seller pursuant to Rule 144 without any volume or manner of sale restrictions thereunder, (iii) if Seller is not an Affiliate of the Company, six (6) months following the Closing, provided, however, that in the case of (i), (ii) and (iii), above, the Seller provides the Company with customary legal representation letters reasonably acceptable to the Company or (iv) if the Seller provides the Company with a legal opinion reasonably acceptable to the Company to the effect that the legend is not required under applicable requirements of the Securities Act. Whenever such restrictions shall cease and terminate as to any Shares, the Holder of such securities shall be entitled to receive from the Company upon a written request in writing, without expense, new securities of like tenor not bearing the legend set forth herein, and such new securities shall be issued promptly, but in no event less than five (5) Business Days after a written request to remove such legends.

(c) Notwithstanding anything herein to the contrary, following registration of the Shares, the Seller agrees not to sell any Shares issued to him if the sales of such Shares would, when combined with the sale of any other Shares by the Seller in any one (1) day period, exceed five percent (5%) of the average daily trading volume of the Company's common stock on the New York Stock Exchange over the five (5) trading days immediately preceding such date of sale; provided, however, that if the aggregate number of Shares represents less than fifty percent (50%) of the average daily trading volume of the Company's common stock on the New York Stock Exchange over the five (5) trading days preceding the Closing Date (as defined in the Purchase Agreement) (the "**Average Volume**"), such resale volume limitations shall not apply. If the aggregate number of Shares issued to the Seller represents more than the Average Volume, the Company may place such legends or stock transfer restrictions on the Shares as shall be appropriate for enforcing the provisions of this Section 2(c).

ARTICLE III
REGISTRATION AND PROCEDURES

Section 3.1 S-3 Registration.

(a) In compliance with the terms of this Agreement, the Company shall prepare and file with the SEC a registration statement on Form S-3ASR (or such other form that the Company is then eligible to use if not eligible to use Form S-3ASR) covering the resale as a secondary offering to be made on a continuous basis pursuant to Rule 415 of all Registrable Securities. The registration statement (or new registration statement) required to be filed pursuant to this Section 3.1, together with any amendments and supplements to such registration statement, including post-effective amendments, and all exhibits and all materials incorporated by reference in such registration statement other than a registration statement on Form S-4 or S-8, is referred to herein as the "**Registration Statement**."

(b) The Company shall exercise commercially reasonable efforts to prepare and file the Registration Statement with the SEC no later than fifteen (15) Business Days after the Closing Date; provided, however, that no filing of such Registration Statement shall be required during any period in which the Company's insider trading policy would prohibit executive officers of the Company from trading in the Company's securities. Subject to the terms of this Agreement, the Company shall use commercially reasonable efforts to have the Registration Statement declared effective as soon as practicable after such filing if not otherwise effective upon filing and to keep the Registration Statement continuously effective as promptly as practical and in compliance with the Securities Act and usable for resale of Registrable Securities covered thereby from the date of its initial effectiveness until the earlier of (i) the date on which such Registrable Securities have been disposed of in accordance with the Registration Statement or pursuant to Rule 144 or (ii) such Registrable Securities may be sold pursuant to Rule 144 without any limitation as to manner-of-sale restrictions or volume limitations (such period, the "**Effectiveness Period**"); provided, however, that nothing in this Agreement shall require the Company to maintain any Registration Statement once the Shares cease to be Registrable Securities.

(c) It shall be a condition precedent to the obligations of the Company to take any action pursuant to Section 3.1 or Section 3.2 with respect to Registrable Securities of a Holder that the Holder shall furnish to the Company such information regarding such Holder as required under Section 3.4(a).

Section 3.2 Registration Procedures; Company Obligations. The Company shall use commercially reasonable efforts to effect the registration of the Registrable Securities in accordance with Section 3.1, and in connection therewith shall have the following obligations:

(a) No later than the first Business Day after the Registration Statement becomes effective, the Company shall file with the SEC the final prospectus included therein pursuant to Rule 424. The Registration Statement, including any preliminary prospectus or final prospectus contained therein or any amendments or supplements thereto, shall comply as to form and content with the applicable requirements of the Securities Act and shall not contain any untrue statement of a material fact or omit to state a material fact required to be stated therein, or necessary to make the statements therein, in light of the circumstances in which they were made, not misleading.

(b) Subject to Section 3.2(h), the Company shall prepare and file with the SEC such amendments and supplements to the Registration Statement and the prospectus used in connection with the Registration Statement as may be necessary to keep the Registration Statement effective and usable for resale of the Registrable Securities covered thereby at all times during the Effectiveness Period. The Company shall use commercially reasonable efforts to cause any post-effective amendment to the Registration Statement that is not effective upon filing to become effective as soon as practicable after such filing. No later than the first Business Day after a post-effective amendment to the Registration Statement becomes effective, the Company shall file with the SEC the final prospectus or prospectus supplement included therein pursuant to Rule 424.

(c) The Company shall as promptly as practicable notify the Holders of the time when the Registration Statement becomes effective or an amendment or supplement to any prospectus forming a part of such Registration Statement has been filed. The Company shall furnish to the Holders, without charge, such documents, including copies of any preliminary prospectus or final prospectus contained in the Registration Statement or any amendments or supplements thereto, as such Holder may reasonably request from time to time in order to facilitate the disposition of the Registrable Securities covered by the Registration Statement.

(d) The Company shall use commercially reasonable efforts to register or qualify, and cooperate with the Holders of Registrable Securities covered by the Registration Statement in connection with the registration or qualification of such Registrable Securities for offer and sale under the securities or "blue sky" laws of each state and other jurisdiction of the United States as any such Holder reasonably requests in writing, and do any and all other things reasonably necessary or advisable to keep such registration or qualification in effect; provided, however, that the Company shall not be required to qualify generally to do business in any jurisdiction where it is not then so qualified or take any action which would subject it to taxation or general service of process in any such jurisdiction where it is not then so subject.

(e) The Company shall promptly notify (which notice shall be accompanied by an instruction to suspend the use of the prospectus) the Holders when a prospectus relating thereto is required to be delivered under the Securities Act of the happening of any event as a result of which any prospectus included in, or relating to, the Registration Statement, as then in effect, includes an untrue statement of a material fact or omits to state a material fact required to be stated therein, or necessary to make the statements therein, in light of the circumstances in which they were made, not misleading (provided that in no event shall such notice contain any material, non-public information), and, subject to Section 3.2(h), promptly prepare and file with the SEC a supplement to the related prospectus or amendment to such Registration Statement or any other required document so that, as thereafter delivered to the Holders, the prospectus will not contain an untrue statement of a material fact or omit to state any material fact required to be stated therein, or necessary to make the statements therein, in light of the circumstances under which they were made, not misleading.

(f) The Company shall use commercially reasonable efforts to prevent the issuance of any stop order or other suspension of effectiveness of the Registration Statement, or the suspension of the qualification of any of the Registrable Securities for sale in any jurisdiction and,

if such an order or suspension is issued, to obtain the withdrawal of such order or suspension as soon as reasonably practicable and to notify the Holders of the issuance of such order and the resolution thereof or its receipt of actual notice of the initiation or threat of any proceeding for such purpose.

(g) The Company shall use commercially reasonable efforts to cause the Registrable Securities covered by the Registration Statement to be (i) listed on the New York Stock Exchange and (ii) reflected in the stock ledger maintained by the Company's transfer agent.

(h) Notwithstanding anything in this Agreement to the contrary, at any time after the Registration Statement becomes effective the Company may delay the disclosure of material, non-public information concerning the Company or any of its subsidiaries if the Board of Directors of the Company has a valid business reason for determining that disclosure of such information is not in the best interests of the Company and such disclosure is not otherwise required (a "**Grace Period**"); provided, however, that the Company shall promptly (i) provide written notice to the Holders of the Grace Period (provided that in no event shall such notice contain any material, non-public information) and the date on which the Grace Period will begin, (ii) advise the Holders in writing to cease sales under the Registration Statement until the end of the Grace Period, (iii) use commercially reasonable efforts to terminate a Grace Period as promptly as possible, and (iv) provide written notice to the Holders of the date on which the Grace Period ends; provided, further, that no Grace Period shall exceed thirty (30) consecutive days and during any twelve (12) month period such Grace Periods shall not exceed an aggregate of sixty (60) days; provided, further, the Company shall not register any securities for its own account or that of any other stockholder during such Grace Period. The provisions of Section 3.2(e) shall not be applicable during any Grace Period. Upon expiration of a Grace Period, the Company shall again be bound by the provisions of Section 3.2(e) with respect to the information giving rise thereto unless such material, non-public information is no longer applicable.

Section 3.3 Current Public Information. During the Effectiveness Period, the Company shall use commercially reasonable efforts to (i) make and keep public information available, as those terms are defined in Rule 144, until all the Registrable Securities cease to be Registrable Securities, and so long as a Holder owns any Registrable Securities, furnish to such Holder upon request a written statement by the Company as to its satisfaction of the current public information requirements of Rule 144 and (ii) file with the SEC in a timely manner all reports and other documents required to be filed by the Company under the Securities Act and the Exchange Act.

Section 3.4 Obligations of the Holders.

(a) Each Holder shall furnish in writing to the Company such information regarding such Holder, the Registrable Securities held by such Holder and the intended method of disposition of the Registrable Securities held by such Holder as shall be reasonably required to effect the registration of such Registrable Securities and shall execute, or shall cause to be executed, such customary documents in connection with such registration as the Company may reasonably request. In connection therewith, upon the execution of this Agreement, each Holder shall complete,

execute and deliver to the Company a selling securityholder notice and questionnaire in the form attached hereto as Exhibit B. At least five (5) Business Days prior to the first anticipated filing date of the Registration Statement, the Company shall notify each Holder of any additional information the Company requires from such Holder, and such Holder shall provide such information to the Company at least three (3) Business Days prior to the first anticipated filing date of the Registration Statement.

(b) Each Holder agrees to cooperate with the Company as reasonably requested by the Company in connection with the preparation and filing of the Registration Statement.

(c) Upon receipt of written notice from the Company of any event of the kind described in Section 3.2(e) or Section 3.2(f) or written notice of any Grace Period, each Holder shall forthwith discontinue disposition of Registrable Securities until such Holder has received copies of a supplemented or amended prospectus or until such Holder is advised in writing by the Company that the use of the prospectus may be resumed or that the Grace Period has ended. If so directed by the Company, such Holder shall use its commercially reasonable efforts to return to the Company (at the Company's expense) all copies of the prospectus covering such Registrable Securities current at the time of receipt of such notice other than permanent file copies then in such Holder's possession.

(d) No Holder shall use any free writing prospectus (as defined in Rule 405) in connection with the sale of Registrable Securities without the prior written consent of the Company.

(e) Each Holder covenants and agrees that it will comply with the prospectus delivery requirements of the Securities Act as applicable to it or an exemption therefrom in connection with sales of Registrable Securities pursuant to any Registration Statement.

Section 3.5 Expenses of Registration. All Registration Expenses incurred in connection with any registration, qualification or compliance hereunder shall be borne by the Company. All Selling Expenses incurred in connection with any registration hereunder shall be borne by the Holders of the Registrable Securities so registered in proportion the Registrable Securities owned by such Holders.

Section 3.6 Transfer of Registration Rights. The rights contained in Section 3.1 hereof to cause the Company to register the Registrable Securities, and the other rights set forth in this Article III, may be assigned or otherwise conveyed by the Seller to any transferee of the Registrable Securities if the Transfer was permitted under Article II and the transferee agrees with the Company in writing to be bound by this Agreement.

ARTICLE IV
INDEMNIFICATION AND CONTRIBUTION

Section 4.1 Indemnification. In the event any Registrable Securities are included in the Registration Statement:

(a) The Company shall indemnify and hold harmless each Holder of Registrable Securities and such Holder's officers, directors, employees, partners, members, agents (including brokers), representatives and Affiliates and each person, if any, who controls such Holder within the meaning of the Securities Act or the Exchange Act (each, a "**Holder Indemnitee**"), against any losses, claims, damages, liabilities or expenses to which they may become subject under the Securities Act, the Exchange Act or other federal or state law, insofar as such losses, claims, damages, or liabilities (or actions in respect thereof) arise out of or are based upon any of the following statements, omissions or violations (collectively, a "**Violation**"): (i) an untrue statement or alleged untrue statement of a material fact contained in the Registration Statement, including any preliminary prospectus or final prospectus contained therein or any amendments or supplements thereto or any documents incorporated therein by reference, (ii) an omission or alleged omission to state therein a material fact required to be stated therein, or necessary to make the statements therein, in light of the circumstances in which they were made, not misleading, and (iii) a violation or alleged violation by the Company or its agents of any rule or regulation promulgated under the Securities Act or the Exchange Act applicable to the Company or its agents and relating to action or inaction required of the Company in connection with the Registration Statement, and the Company will pay to each such Holder Indemnitee, as accrued, any legal or other expenses reasonably incurred by he, she or it in connection with investigating or defending any such loss, claim, damage, liability, action or expense; provided, however, that the indemnification contained in this Section 4.1(a) shall not apply to amounts paid in settlement of any such loss, claim, damage, liability, action or expense if such settlement is effected without the consent of the Company (which consent shall not be unreasonably withheld, conditioned or delayed), nor shall the Company be liable for any such loss, claim, damage, liability, action or expense to the extent that it arises out of or is based upon a Violation which occurs (A) in reliance upon and in conformity with written information furnished by a Holder, (B) in connection with any failure of such person to deliver or cause to be delivered a prospectus made available by the Company in a timely manner, (C) in connection with any offers or sales effected by or on behalf of any Holder Indemnitee in violation of Section 3.4(c) of this Agreement, or (D) as a result of offers or sales effected by or on behalf of any Holder Indemnitee by means of a free writing prospectus (as defined in Rule 405) that was not authorized in writing by the Company. Such indemnity shall remain in full force and effect regardless of any investigation made by or on behalf of any such Holder Indemnitee, and shall survive the transfer of such securities by such Holder, and any termination of this Agreement.

(b) Each Holder, severally and not jointly, shall indemnify and hold harmless the Company and each of its officers, directors, employees, agents, representatives and Affiliates and persons, if any, who control the Company within the meaning of the Securities Act or the Exchange Act (each, a "**Company Indemnitee**"), against any losses, claims, damages, liabilities or expenses to which any of the Company Indemnitees may become subject under the Securities Act, the Exchange Act or other federal or state law, insofar as such losses, claims, damages, or liabilities (or actions in respect thereof) arise out of or are based upon any (i) untrue statement or alleged untrue statement of a material fact regarding such Holder and provided in writing by such Holder which is contained in the Registration Statement, including any preliminary prospectus or final prospectus contained therein or any amendments or supplements thereto, (ii) the omission or alleged omission to state therein a material fact required to be stated therein, or necessary to make the statements therein, in light of the circumstances in which they were made, not misleading, in

each case to the extent (and only to the extent) that such untrue statement or alleged untrue statement or omission or alleged omission was made in the Registration Statement, preliminary or final prospectus, amendment or supplement thereto, in reliance upon and in conformity with written information furnished by such Holder, (iii) a violation or alleged violation by a Holder of any rule or regulation promulgated under the Securities Act or the Exchange Act applicable to such Holder and relating to action or inaction required of such Holder in connection with the registration of such Holder's Registrable Securities or (iv) in connection with any offer or sales effected by or on behalf of such Holder in violation of Section 3.4(c) of this Agreement, and each Holder will pay, as accrued, any legal or other expenses reasonably incurred by any Company Indemnitee pursuant to this Section 4.1(b), in connection with investigating or defending any such loss, claim, damage, liability, action or expense as a result of a Holder's untrue statement or omission or violation; provided, however, that the indemnification contained in this Section 4.1(b) shall not apply to amounts paid in settlement of any such loss, claim, damage, liability, action or expense if such settlement is effected without the consent of such Holder (which consent shall not be unreasonably withheld, conditioned or delayed). Notwithstanding the foregoing, the amount any Holder will be obligated to pay pursuant to this Section 4.1(b) and Section 4.2 will be limited to an amount equal to the gross proceeds actually received by such Holder for the sale of the Registrable Securities pursuant to the Registration Statement which gives rise to such obligation to indemnify and/or contribute (net of all expenses paid by such Holder in connection with any claim relating to this Section 4.1(b) and Section 4.2 and the aggregate amount of any damages which such Holder has otherwise been required to pay in respect of such loss, liability, claim, damage, or expense or any substantially similar loss, liability, claim, damage, or expense arising from the sale of such Registrable Securities). Such indemnity shall remain in full force and effect regardless of any investigation made by or on behalf of any such Company Indemnitee, and shall survive the transfer of such securities by such Holder, and any termination of this Agreement.

(c) Promptly after receipt by a party to this Agreement entitled to indemnity hereunder (an "**Indemnified Party**") under this Section 4.1 of notice of the commencement of any action (including any governmental action), such Indemnified Party will, if a claim in respect thereof is to be made against any party to this Agreement from whom indemnification may be sought under this Section 4.1 (an "**Indemnifying Party**"), deliver to the Indemnifying Party a written notice of the commencement thereof and the Indemnifying Party shall have the right to participate in, and, to the extent the Indemnifying Party so desires, jointly with any other Indemnifying Party similarly noticed, to assume the defense thereof with counsel reasonably satisfactory to the Indemnifying Party; provided, however, that an Indemnified Party (together with all other Indemnified Parties which may be represented without conflict by one counsel) shall have the right to retain one separate counsel, with the reasonable fees and expenses of such counsel to be paid by the Indemnifying Party, if (i) the Indemnifying Party shall have failed to assume the defense of such claim within seven (7) days after receipt of notice of the claim and to employ counsel reasonably satisfactory to such Indemnified Party, as the case may be; or (ii) in the reasonable opinion of counsel retained by the Indemnified Party, representation of such Indemnified Party by such counsel would be inappropriate due to actual or potential differing interests (including the availability of differing legal defenses) between such Indemnified Party and any other party represented by such counsel in such proceeding. It is understood that the Indemnifying Party shall not, in connection with any proceeding in the same jurisdiction, be liable for fees or expenses of more than one separate counsel

at any time for all such Indemnified Parties. The Indemnified Party shall cooperate fully with the Indemnifying Party in connection with any negotiation or defense of any such action or claim by the Indemnifying Party and shall furnish to the Indemnifying Party all information reasonably available to the Indemnified Party which relates to such action or claim. The Indemnifying Party shall keep the Indemnified Party reasonably apprised of the status of the defense or any settlement negotiations with respect thereto. No Indemnifying Party will, except with the consent of the Indemnified Party, consent to entry of any judgment or enter into any settlement that does not include as an unconditional term thereof the giving by the claimant or plaintiff to such Indemnified Party of a release from all liability in respect of such action or claim. No Indemnifying Party shall be liable for any settlement of any action, claim or proceeding effected without its prior written consent; provided, however, that the Indemnifying Party shall not unreasonably withhold, delay or condition its consent. The failure to deliver written notice to the Indemnifying Party within a reasonable time of the commencement of any such action shall not relieve such Indemnifying Party of any liability to the Indemnified Party under this Section 4.1, except to the extent such failure to give notice has a material adverse effect on the ability of the Indemnifying Party to defend such action.

Section 4.2 Contribution. If the indemnification provided for in Section 4.1 is held by a court of competent jurisdiction to be unavailable to an Indemnified Party with respect to any loss, liability, claim, damage, or expense referred to therein, then the Indemnifying Party, in lieu of indemnifying such Indemnified Party hereunder, shall contribute to the amount paid or payable by such Indemnified Party as a result of such loss, liability, claim, damage, or expense in such proportion as is appropriate to reflect the relative fault of the Indemnifying Party on the one hand and of the Indemnified Party on the other in connection with the statements or omissions that resulted in such loss, liability, claim, damage, or expense as well as any other relevant equitable considerations. The relative fault of the Indemnifying Party and of the Indemnified Party shall be determined by reference to, among other things, whether the untrue or alleged untrue statement of a material fact or the omission to state a material fact relates to information supplied by the Indemnifying Party or by the Indemnified Party and the parties' relative intent, knowledge, access to information, and opportunity to correct or prevent such statement or omission. Notwithstanding the foregoing, the amount any Holder will be obligated to severally and not jointly contribute pursuant to this Section 4.2, together with Holder's liability under Section 4.1(b), will be limited to an amount equal to the gross proceeds received by a Holder for the sale of the Registrable Securities pursuant to the Registration Statement which gives rise to such obligation to contribute and/or indemnify (net of all expenses paid by such Holder in connection with any claim relating to Section 4.1(b) and this Section 4.2 and the aggregate amount of any damages which such Holder has otherwise been required to pay in respect of such loss, liability, claim, damage, or expense or any substantially similar loss, liability, claim, damage, or expense arising from the sale of such Registrable Securities). No person guilty of fraudulent misrepresentation (within the meaning of Section 11(f) of the Securities Act) will be entitled to contribution hereunder from any person who was not guilty of such fraudulent misrepresentation.

ARTICLE V
GENERAL PROVISIONS

Section 5.1 Entire Agreement. This Agreement (including Exhibit A hereto) constitutes the entire understanding and agreement between the parties as to the matters covered herein and supersedes and replaces any prior understanding, agreement or statement of intent, in each case, written or oral, of any and every nature with respect thereto.

Section 5.2 Notices. Any notice or other communication required or permitted to be delivered to any party under this Agreement shall be in writing and shall be deemed properly delivered, given and received (a) upon receipt when delivered by hand, (b) upon transmission, if sent by facsimile or electronic transmission (in each case with receipt verified by electronic confirmation), or (c) one (1) Business Day after being sent by courier or express delivery service, specifying next day delivery, with proof of receipt. The addresses, email addresses and facsimile numbers for such notices and communications are those set forth on the signature pages hereof, or such other address, email address or facsimile numbers as may be designated in writing hereafter, in the same manner, by any such person.

Section 5.3 Counterparts. This Agreement may be executed in one or more counterparts, all of which shall be considered one and the same agreement and shall become effective when one or more counterparts have been signed by each of the parties and delivered to the other parties, it being understood that all parties need not sign the same counterpart and such counterparts may be delivered by the parties hereto via facsimile or electronic transmission.

Section 5.4 Amendment; Waiver. This Agreement may be amended or modified, and any provision hereof may be waived, in whole or in part, at any time pursuant to an agreement in writing executed by the Company and Holders holding a majority of the Registrable Securities at such time. Any failure by any party at any time to enforce any of the provisions of this Agreement shall not be construed a waiver of such provision or any other provisions hereof.

Section 5.5 Severability. In the event that any provision of this Agreement or the application thereof becomes or is declared by a court of competent jurisdiction to be illegal, void or unenforceable, the remainder of this Agreement will continue in full force and effect and the application of such provision to other persons or circumstances will be interpreted so as reasonably to effect the intent of the parties hereto.

Section 5.6. **Governing Law; Venue**. This Agreement and all claims or causes of action (whether sounding in contract or tort) arising under or related to this Agreement, shall be governed by and construed in accordance with, the Laws of the State of California, without regard to any rule or principle that might refer the governance or construction of this Agreement to the Laws of another jurisdiction. In any action or proceeding between any of the parties arising under or related to this Agreement, each of the parties (a) knowingly, voluntarily, irrevocably and unconditionally consents and submits to the exclusive jurisdiction and venue of the state or federal courts located in the City and County of San Francisco, California, and each of the Parties hereby irrevocably submits to the exclusive jurisdiction of the aforesaid courts, (b) agrees that all claims in respect of any such action or proceeding shall be heard and determined exclusively in accordance with clause (a) of this Section 5.6, (c) waives any objection to the laying of venue of any such action or proceeding in such courts, including any objection that any such action or proceeding has been brought in an inconvenient forum or that the court does not have jurisdiction over any party, and (d) agrees that service of

process upon such party in any such action or proceeding shall be effective if such process is given as a notice in accordance with Section 5.2. The parties agree that any party may commence a proceeding in a court other than the above-named courts solely for the purpose of enforcing an order or judgment issued by one of the above-named courts.

Section 5.7 Specific Performance. Each party acknowledges and agrees that the other parties hereto would be irreparably harmed and would not have any adequate remedy at law in the event that any of the provisions of this Agreement were not performed by such first party in accordance with their specific terms or were otherwise breached by such first party. Accordingly, each party agrees that the other parties hereto shall be entitled to an injunction or injunctions to prevent breaches of this Agreement and to enforce specifically the terms and provisions of this Agreement, this being in addition to any other remedy to which such parties are entitled at law or in equity.

(Next Page is Signature Page)

IN WITNESS WHEREOF, each of the parties has executed this Agreement as of the date first written above.

COMPANY:

INVITAE CORPORATION

By: /s/ Sean E. George, Ph. D.
Name: Sean E. George, Ph. D.
Title: President and Chief Executive Officer

Address for Notice:

1400 16th Street
San Francisco, California 94103

Attn: General Counsel

Facsimile No.:

IN WITNESS WHEREOF, each of the parties has executed this Agreement as of the date first written above.

SELLER:

Name: Peter Schols

By: /s/ Peter Schols
Name: Peter Schols
Title: CEO

Address for Notice:
Telephone No.:
Facsimile No.:
Email Address:

[Signature Page to Registration Rights Agreement]

Exhibit 10.1

EXECUTION VERSION

INVITAE CORPORATION

2015 STOCK INCENTIVE PLAN

(As Amended and Restated by the Board of Directors on March 6, 2020)

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INVITAE CORPORATION

2015 STOCK INCENTIVE PLAN

SECTION 1. ESTABLISHMENT AND PURPOSE.

The Plan was adopted by the Board of Directors on January 8, 2015 and became effective immediately prior to the closing of the initial offering of Stock to the public pursuant to a registration statement filed by the Company with the Securities and Exchange Commission (the "Effective Date"), was amended and restated on June 11, 2019, and was further amended and restated on March 6, 2020. The purpose of the Plan is to promote the long-term success of the Company and the creation of stockholder value by (a) encouraging Employees, Outside Directors and Consultants to focus on critical long-range objectives, (b) encouraging the attraction and retention of Employees, Outside Directors and Consultants with exceptional qualifications and (c) linking Employees, Outside Directors and Consultants directly to stockholder interests through increased stock ownership. The Plan seeks to achieve this purpose by providing for Awards in the form of restricted shares, stock units, options (which may constitute incentive stock options or nonstatutory stock options), stock appreciation rights or cash-based awards.

SECTION 2. DEFINITIONS.

(a) *"Affiliate"* shall mean any entity other than a Subsidiary, if the Company and/or one or more Subsidiaries own not less than 50% of such entity.

(b) *"Award"* shall mean any award of an Option, a SAR, a Restricted Share or a Stock Unit or a Cash-Based Award under the Plan.

(c) *"Award Agreement"* shall mean the agreement between the Company and the recipient of an Award which contains the terms, conditions and restrictions pertaining to such Award.

(d) *"Board of Directors" or "Board"* shall mean the Board of Directors of the Company, as constituted from time to time.

(e) *"Cash-Based Award"* shall mean an Award that entitles the Participant to receive a cash-denominated payment.

(f) *"Change in Control"* shall mean the occurrence of any of the following events:

(i) A change in the composition of the Board of Directors occurs, as a result of which fewer than one-half of the incumbent directors are directors who either:

(A) Had been directors of the Company on the "look-back date" (as defined below) (the "original directors"); or

(B) Were elected, or nominated for election, to the Board of Directors with the affirmative votes of at least a majority of the aggregate of the original directors who were still in office at the time of the election or nomination and the directors whose election or

nomination was previously so approved (the "continuing directors");

provided, however, that for this purpose, the "original directors" and "continuing directors" shall not include any individual whose initial assumption of office occurred as a result of an actual or threatened election contest with respect to the election or removal of directors or other actual or threatened solicitation of proxies or consents, by or on behalf of a person other than the Board; or

(ii) Any "person" (as defined below) who by the acquisition or aggregation of securities, is or becomes the "beneficial owner" (as defined in Rule 13d-3 under the Exchange Act), directly or indirectly, of securities of the Company representing 50% or more of the combined voting power of the Company's then outstanding securities ordinarily (and apart from rights accruing under special circumstances) having the right to vote at elections of directors (the "Base Capital Stock"); except that any change in the relative beneficial ownership of the Company's securities by any person resulting solely from a reduction in the aggregate number of outstanding shares of Base Capital Stock, and any decrease thereafter in such person's ownership of securities, shall be disregarded until such person increases in any manner, directly or indirectly, such person's beneficial ownership of any securities of the Company; or

(iii) The consummation of a merger or consolidation of the Company or a Subsidiary of the Company with or into another entity or any other corporate reorganization, if persons who were not stockholders of the Company immediately prior to such merger, consolidation or other reorganization own immediately after such merger, consolidation or other reorganization 50% or more of the voting power of the outstanding securities of each of (A) the Company (or its successor) and (B) any direct or indirect parent corporation of the Company (or its successor); or

(iv) The sale, transfer or other disposition of all or substantially all of the Company's assets.

For purposes of subsection (e)(i) above, the term "look-back" date shall mean the later of (1) the Effective Date or (2) the date 24 months prior to the date of the event that may constitute a Change in Control.

For purposes of subsection (e)(ii)) above, the term "person" shall have the same meaning as when used in Sections 13(d) and 14(d) of the Exchange Act but shall exclude (1) a trustee or other fiduciary holding securities under an employee benefit plan maintained by the Company or a Parent or Subsidiary and (2) a corporation owned directly or indirectly by the stockholders of the Company in substantially the same proportions as their ownership of the Stock.

Any other provision of this Section 2(e) notwithstanding, a transaction shall not constitute a Change in Control if its sole purpose is to change the state of the Company's incorporation or to create a holding company that will be owned in substantially the same proportions by the persons who held the Company's securities immediately before such transaction, and a Change in Control shall not be deemed to occur if the Company files a registration statement with the United States Securities and Exchange Commission for the initial or secondary public offering of securities or debt of the Company to the public.

(g) *"Code"* shall mean the Internal Revenue Code of 1986, as amended.

(h) *"Committee"* shall mean the Compensation Committee as designated by the Board of Directors, which is authorized to administer the Plan, as described in Section 3 hereof.

(i) *"Company"* shall mean Invitae Corporation, a Delaware corporation.

(j) *"Consultant"* shall mean a consultant or advisor who provides bona fide services to the Company, a Parent, a Subsidiary or an Affiliate as an independent contractor (not including service as a member of the Board of Directors) or a member of the board of directors of a Parent or a Subsidiary, in each case who is not an Employee.

(k) *"Employee"* shall mean any individual who is a common-law employee of the Company, a Parent, a Subsidiary or an Affiliate.

(l) *"Exchange Act"* shall mean the Securities Exchange Act of 1934, as amended.

(m) *"Exercise Price"* shall mean, in the case of an Option, the amount for which one Share may be purchased upon exercise of such Option, as specified in the applicable Stock Option Agreement. "Exercise Price," in the case of a SAR, shall mean an amount, as specified in the applicable SAR Agreement, which is subtracted from the Fair Market Value of one Share in determining the amount payable upon exercise of such SAR.

(n) *"Fair Market Value"* with respect to a Share, shall mean the market price of one Share, determined by the Committee as follows:

(i) If the Stock was traded over-the-counter on the date in question, then the Fair Market Value shall be equal to the last transaction price quoted for such date by the OTC Bulletin Board or, if not so quoted, shall be equal to the mean between the last reported representative bid and asked prices quoted for such date by the principal automated inter-dealer quotation system on which the Stock is quoted or, if the Stock is not quoted on any such system, by the Pink Quote system;

(ii) If the Stock was traded on any established stock exchange (such as the New York Stock Exchange, The Nasdaq Global Market or The Nasdaq Global Select Market) or national market system on the date in question,

then the Fair Market Value shall be equal to the closing price reported for such date by the applicable exchange or system; and

(iii) If none of the foregoing provisions is applicable, then the Fair Market Value shall be determined by the Committee in good faith on such basis as it deems appropriate.

In all cases, the determination of Fair Market Value by the Committee shall be conclusive and binding on all persons.

(o) *"ISO"* shall mean an employee incentive stock option described in Section 422 of the Code.

(p) *"Nonstatutory Option" or "NSO"* shall mean an employee stock option that is not an ISO.

(q) *"Option"* shall mean an ISO or Nonstatutory Option granted under the Plan and entitling the holder to purchase Shares.

(r) *"Outside Director"* shall mean a member of the Board of Directors who is not a common-law employee of, or paid consultant to, the Company, a Parent or a Subsidiary.

(s) *"Parent"* shall mean any corporation (other than the Company) in an unbroken chain of corporations ending with the Company, if each of the corporations other than the Company owns stock possessing 50% or more of the total combined voting power of all classes of stock in one of the other corporations in such chain. A corporation that attains the status of a Parent on a date after the adoption of the Plan shall be a Parent commencing as of such date.

(t) *"Participant"* shall mean a person who holds an Award.

(u) *"Performance Based Award"* shall mean any Restricted Share Award, Stock Unit Award or Cash-Based Award granted to a Participant pursuant to the terms set forth in Section 20.

(v) *"Plan"* shall mean this 2015 Stock Incentive Plan of Invitae Corporation, as amended from time to time.

(w) *"Purchase Price"* shall mean the consideration for which one Share may be acquired under the Plan (other than upon exercise of an Option), as specified by the Committee.

(x) *"Restricted Share"* shall mean a Share awarded under the Plan.

(y) *"SAR"* shall mean a stock appreciation right granted under the Plan.

(z) *"Service"* shall mean service as an Employee, Consultant or Outside Director, subject to such further limitations as may be set forth in the Plan or the applicable Award Agreement. Service does not terminate when an Employee goes on a bona fide leave of absence, that was approved by the Company in writing, if the terms of the leave provide for continued

Service crediting, or when continued Service crediting is required by applicable law. However, for purposes of determining whether an Option is entitled to ISO status, an Employee's employment will be treated as terminating three months after such Employee went on leave, unless such Employee's right to return to active work is guaranteed by law or by a contract. Service terminates in any event when the approved leave ends, unless such Employee immediately returns to active work. The Company determines which leaves of absence count toward Service, and when Service terminates for all purposes under the Plan.

(aa) *"Share"* shall mean one share of Stock, as adjusted in accordance with Section 12 (if applicable).

(bb) *"Stock"* shall mean the Common Stock of the Company.

(cc) *"Stock Unit"* shall mean a bookkeeping entry representing the Company's obligation to deliver one Share (or distribute cash) on a future date in accordance with the provisions of a Stock Unit Award Agreement.

(dd) *"Subsidiary"* shall mean any corporation, if the Company and/or one or more other Subsidiaries own not less than 50% of the total combined voting power of all classes of outstanding stock of such corporation. A corporation that attains the status of a Subsidiary on a date after the adoption of the Plan shall be considered a Subsidiary commencing as of such date.

(ee) *"Total and Permanent Disability"* shall mean any permanent and total disability as defined by Section 22(e)(3) of the Code.

SECTION 3. ADMINISTRATION.

(a) *Committee Composition*. The Plan shall be administered by a Committee appointed by the Board, or by the Board acting as the Committee. The Committee shall consist of two or more directors of the Company. In addition, to the extent required by the Board, the composition of the Committee shall satisfy (i) such requirements as the Securities and Exchange Commission may establish for administrators acting under plans intended to qualify for exemption under Rule 16b-3 (or its successor) under the Exchange Act; and (ii) such requirements as the Internal Revenue Service may establish for outside directors acting under plans intended to qualify for exemption under Section 162(m)(4)(C) of the Code.

(b) *Committee for Non-Officer Grants*. The Board may also appoint one or more separate committees of the Board, each composed of one or more directors of the Company who need not satisfy the requirements of Section 3(a), who may administer the Plan with respect to Employees who are not considered officers or directors of the Company under Section 16 of the Exchange Act, may grant Awards under the Plan to such Employees and may determine all terms of such grants. Within the limitations of the preceding sentence, any reference in the Plan to the Committee shall include such committee or committees appointed pursuant to the preceding sentence. To the extent permitted by applicable laws, the Board of Directors may also authorize one or more officers of the Company to designate Employees, other than officers under Section 16 of the Exchange Act, to receive Awards and/or to determine the number of such Awards to be

received by such persons; provided, however, that the Board of Directors shall specify the total number of Awards that such officers may so award.

(c) *Committee Procedures*. The Board of Directors shall designate one of the members of the Committee as chairman. The Committee may hold meetings at such times and places as it shall determine. The acts of a majority of the Committee members present at meetings at which a quorum exists, or acts reduced to or approved in writing (including via email) by all Committee members, shall be valid acts of the Committee.

(d) *Committee Responsibilities*. Subject to the provisions of the Plan, the Committee shall have full authority and discretion to take the following actions:

(i) To interpret the Plan and to apply its provisions;

(ii) To adopt, amend or rescind rules, procedures and forms relating to the Plan;

(iii) To adopt, amend or terminate sub-plans established for the purpose of satisfying applicable foreign laws including qualifying for preferred tax treatment under applicable foreign tax laws;

(iv) To authorize any person to execute, on behalf of the Company, any instrument required to carry out the purposes of the Plan;

(v) To determine when Awards are to be granted under the Plan;

(vi) To select the Participants to whom Awards are to be granted;

(vii) To determine the type of Award and number of Shares or amount of cash to be made subject to each Award;

(viii) To prescribe the terms and conditions of each Award, including (without limitation) the Exercise Price and Purchase Price, and the vesting or duration of the Award (including accelerating the vesting of Awards, either at the time of the Award or thereafter, without the consent of the Participant), to determine whether an Option is to be classified as an ISO or as a Nonstatutory Option, and to specify the provisions of the agreement relating to such Award;

(ix) To amend any outstanding Award Agreement, subject to applicable legal restrictions and to the consent of the Participant if the Participant's rights or obligations would be materially impaired;

(x) To prescribe the consideration for the grant of each Award or other right under the Plan and to determine the sufficiency of such consideration;

(xi) To determine the disposition of each Award or other right under the Plan in the event of a Participant's divorce or dissolution of marriage;

(xii) To determine whether Awards under the Plan will be granted in replacement of other grants under an incentive or other compensation plan of an acquired business;

(xiii) To correct any defect, supply any omission, or reconcile any inconsistency in the Plan or any Award Agreement;

(xiv) To establish or verify the extent of satisfaction of any performance goals or other conditions applicable to the grant, issuance, exercisability, vesting and/or ability to retain any Award; and

(xv) To take any other actions deemed necessary or advisable for the administration of the Plan.

Subject to the requirements of applicable law, the Committee may designate persons other than members of the Committee to carry out its responsibilities and may prescribe such conditions and limitations as it may deem appropriate, except that the Committee may not delegate its authority with regard to the selection for participation of or the granting of Awards under the Plan to persons subject to Section 16 of the Exchange Act. All decisions, interpretations and other actions of the Committee shall be final and binding on all Participants and all persons deriving their rights from a Participant. No member of the Committee shall be liable for any action that he has taken or has failed to take in good faith with respect to the Plan or any Award under the Plan.

SECTION 4. ELIGIBILITY.

(a) *General Rule*. Only Employees, Consultants and Outside Directors shall be eligible for the grant of Awards. Only common-law employees of the Company, a Parent or a Subsidiary shall be eligible for the grant of ISOs.

(b) *Ten-Percent Stockholders*. An Employee who owns more than 10% of the total combined voting power of all classes of outstanding stock of the Company, a Parent or Subsidiary shall not be eligible for the grant of an ISO unless such grant satisfies the requirements of Section 422(c)(5) of the Code.

(c) *Attribution Rules*. For purposes of Section 4(c) above, in determining stock ownership, an Employee shall be deemed to own the stock owned, directly or indirectly, by or for such Employee's brothers, sisters, spouse, ancestors and lineal descendants. Stock owned, directly or indirectly, by or for a corporation, partnership, estate or trust shall be deemed to be owned proportionately by or for its stockholders, partners or beneficiaries.

(d) *Outstanding Stock*. For purposes of Section 4(c) above, "outstanding stock" shall include all stock actually issued and outstanding immediately after the grant. "Outstanding

stock" shall not include shares authorized for issuance under outstanding options held by the Employee or by any other person.

SECTION 5. STOCK SUBJECT TO PLAN.

(a) *Basic Limitation*. Shares offered under the Plan shall be authorized but unissued Shares or treasury Shares. The aggregate number of Shares authorized for issuance as Awards under the Plan (other than Inducement Awards as set forth in Section 15) shall not exceed the sum of (x) 4,250,000 Shares, plus (y) the sum of the number of Shares subject to outstanding awards under the Company's 2010 Stock Plan (the "Predecessor Plan") on the Effective Date that are subsequently forfeited or terminated for any reason before being exercised or settled, plus the number of Shares subject to vesting restrictions under the Predecessor Plan on the Effective Date that are subsequently forfeited, plus the number of reserved Shares not issued or subject to outstanding grants under the Predecessor Plan on the Effective Date, plus (z) an annual increase on the first day of each fiscal year, for a period of not more than ten years, beginning on January 1, 2016, and ending on (and including) January 1, 2025, in an amount equal to the lesser of (i) four percent (4%) of the outstanding Shares on the last day of the immediately preceding fiscal or (ii) if the Board acts prior to the first day of the fiscal year, such lesser amount (including zero) that the Board determines for purposes of the annual increase for that fiscal year. Notwithstanding the foregoing, the number of Shares that may be delivered in the aggregate pursuant to the exercise of ISOs granted under the Plan shall not exceed 16,833,333 Shares plus, to the extent allowable under Section 422 of the Code and the Treasury Regulations promulgated thereunder, any Shares that become available for issuance under the Plan pursuant to Section 5(c). The limitations of this Section 5(a) shall be subject to adjustment pursuant to Section 12. The number of Shares that are subject to Awards outstanding at any time under the Plan shall not exceed the number of Shares which then remain available for issuance under the Plan. The Company shall at all times reserve and keep available sufficient Shares to satisfy the requirements of the Plan.

(b) *Award Limitation*. No Participant eligible for an Award may receive Options or SARs under the Plan, excluding Inducement Awards, in any calendar year that relate to an aggregate of more than 2,000,000 Shares, and no more than two times this amount in the first year of employment. In applying the foregoing limitation with respect to a Participant, if any Option or SAR is canceled, the canceled Option or SAR shall continue to count against the maximum number of Shares with respect to which Options and SARs may be granted to the Participant. For this purpose, the repricing of an Option or SAR shall be treated as the cancellation of the existing Option or SAR and the grant of a new Option or SAR.

(c) *Additional Shares*. If Restricted Shares or Shares issued upon the exercise of Options are forfeited, then such Shares shall again become available for Awards under the Plan. If Stock Units, Options or SARs are forfeited or terminate for any reason before being exercised or settled, or an Award is settled in cash without the delivery of Shares to the holder, then any Shares subject to the Award shall again become available for Awards under the Plan. Only the number of Shares (if any) actually issued in settlement of Awards (and not forfeited) shall reduce the number available in Section 5(a) and the balance shall again become available for Awards

under the Plan. Any Shares withheld to satisfy the grant or exercise price or tax withholding obligation pursuant to any Award shall again become available for Awards under the Plan. Notwithstanding the foregoing provisions of this Section 5(c), Shares that have actually been issued shall not again become available for Awards under the Plan, except for Shares that are forfeited and do not become vested.

(d) *Substitution and Assumption of Awards*. The Committee may make Awards under the Plan by assumption, substitution or replacement of stock options, stock appreciation rights, stock units or similar awards granted by another entity (including a Parent or Subsidiary), if such assumption, substitution or replacement is in connection with an asset acquisition, stock acquisition, merger, consolidation or similar transaction involving the Company (and/or its Parent or Subsidiary) and such other entity (and/or its affiliate). The terms of such assumed, substituted or replaced Awards shall be as the Committee, in its discretion, determines is appropriate. Any such substitute or assumed Awards shall not count against the Share limitation set forth in Section 5(a).

SECTION 6. RESTRICTED SHARES.

(a) *Restricted Share Award Agreement*. Each grant of Restricted Shares under the Plan shall be evidenced by a Restricted Share Award Agreement between the Participant and the Company. Such Restricted Shares shall be subject to all applicable terms of the Plan and may be subject to any other terms that are not inconsistent with the Plan. The provisions of the various Restricted Share Award Agreements entered into under the Plan need not be identical.

(b) *Payment for Awards*. Restricted Shares may be sold or awarded under the Plan for such consideration as the Committee may determine, including (without limitation) cash, cash equivalents, full-recourse promissory notes, past services and future services.

(c) *Vesting*. Each Award of Restricted Shares may or may not be subject to vesting. Vesting shall occur, in full or in installments, upon satisfaction of the conditions specified in the Restricted Share Award Agreement. A Restricted Share Award Agreement may provide for accelerated vesting in the event of the Participant's death, disability or retirement or other events. The Committee may determine, at the time of granting Restricted Shares or thereafter, that all or part of such Restricted Shares shall become vested in the event that a Change in Control occurs with respect to the Company.

(d) *Voting and Dividend Rights*. The holders of Restricted Shares awarded under the Plan shall have the same voting, dividend and other rights as the Company's other stockholders. A Restricted Share Award Agreement, however, may require that the holders of Restricted Shares invest any cash dividends received in additional Restricted Shares. Such additional Restricted Shares shall be subject to the same conditions and restrictions as the Award with respect to which the dividends were paid.

(e) *Restrictions on Transfer of Shares*. Restricted Shares shall be subject to such rights of repurchase, rights of first refusal or other restrictions as the Committee may determine.

Such restrictions shall be set forth in the applicable Restricted Share Award Agreement and shall apply in addition to any general restrictions that may apply to all holders of Shares.

SECTION 7. TERMS AND CONDITIONS OF OPTIONS.

(a) *Stock Option Award Agreement*. Each grant of an Option under the Plan shall be evidenced by a Stock Option Award Agreement between the Participant and the Company. Such Option shall be subject to all applicable terms and conditions of the Plan and may be subject to any other terms and conditions which are not inconsistent with the Plan and which the Committee deems appropriate for inclusion in a Stock Option Award Agreement. The Stock Option Award Agreement shall specify whether the Option is an ISO or an NSO. The provisions of the various Stock Option Award Agreements entered into under the Plan need not be identical.

(b) *Number of Shares*. Each Stock Option Award Agreement shall specify the number of Shares that are subject to the Option and shall provide for the adjustment of such number in accordance with Section 12.

(c) *Exercise Price*. Each Stock Option Award Agreement shall specify the Exercise Price. The Exercise Price of an ISO shall not be less than 100% of the Fair Market Value of a Share on the date of grant, except as otherwise provided in 4(c), and the Exercise Price of an NSO shall not be less 100% of the Fair Market Value of a Share on the date of grant. Notwithstanding the foregoing, Options may be granted with an Exercise Price of less than 100% of the Fair Market Value per Share on the date of grant pursuant to a transaction described in, and in a manner consistent with, Section 424(a) of the Code. Subject to the foregoing in this Section 7(c), the Exercise Price under any Option shall be determined by the Committee in its sole discretion. The Exercise Price shall be payable in one of the forms described in Section 8.

(d) *Withholding Taxes*. As a condition to the exercise of an Option, the Participant shall make such arrangements as the Committee may require for the satisfaction of any federal, state, local or foreign withholding tax obligations that may arise in connection with such exercise. The Participant shall also make such arrangements as the Committee may require for the satisfaction of any federal, state, local or foreign withholding tax obligations that may arise in connection with the disposition of Shares acquired by exercising an Option.

(e) *Exercisability and Term*. Each Stock Option Award Agreement shall specify the date when all or any installment of the Option is to become exercisable. The Stock Option Award Agreement shall also specify the term of the Option; provided that the term of an ISO shall in no event exceed 10 years from the date of grant (five years for ISOs granted to Employees described in Section 4(c)). A Stock Option Award Agreement may provide for accelerated exercisability in the event of the Participant's death, disability, or retirement or other events and may provide for expiration prior to the end of its term in the event of the termination of the Participant's Service. Options may be awarded in combination with SARs, and such an Award may provide that the Options will not be exercisable unless the related SARs are forfeited. Subject to the foregoing in this Section 7(e), the Committee at its sole discretion shall determine when all or any installment of an Option is to become exercisable and when an Option is to expire.

(f) *Exercise of Options*. Each Stock Option Award Agreement shall set forth the extent to which the Participant shall have the right to exercise the Option following termination of the Participant's Service with the Company and its Subsidiaries, and the right to exercise the Option of any executors or administrators of the Participant's estate or any person who has acquired such Option(s) directly from the Participant by bequest or inheritance. Such provisions shall be determined in the sole discretion of the Committee, need not be uniform among all Options issued pursuant to the Plan, and may reflect distinctions based on the reasons for termination of Service.

(g) *Effect of Change in Control*. The Committee may determine, at the time of granting an Option or thereafter, that such Option shall become exercisable as to all or part of the Shares subject to such Option in the event that a Change in Control occurs with respect to the Company.

(h) *No Rights as a Stockholder*. A Participant shall have no rights as a stockholder with respect to any Shares covered by his Option until the date of the issuance of a stock certificate for such Shares. No adjustments shall be made, except as provided in Section 12.

(i) *Modification, Extension and Renewal of Options*. Within the limitations of the Plan, the Committee may modify, extend or renew outstanding options or may accept the cancellation of outstanding options (to the extent not previously exercised), whether or not granted hereunder, in return for the grant of new Options for the same or a different number of Shares and at the same or a different Exercise Price, or in return for the grant of a different Award for the same or a different number of Shares, without stockholder approval. The foregoing notwithstanding, no modification of an Option shall, without the consent of the Participant, materially impair his or her rights or obligations under such Option.

(j) *Restrictions on Transfer of Shares*. Any Shares issued upon exercise of an Option shall be subject to such special forfeiture conditions, rights of repurchase, rights of first refusal and other transfer restrictions as the Committee may determine. Such restrictions shall be set forth in the applicable Stock Option Award Agreement and shall apply in addition to any general restrictions that may apply to all holders of Shares.

(k) *Buyout Provisions*. The Committee may at any time (a) offer to buy out for a payment in cash or cash equivalents an Option previously granted or (b) authorize a Participant to elect to cash out an Option previously granted, in either case at such time and based upon such terms and conditions as the Committee shall establish.

SECTION 8. PAYMENT FOR SHARES.

(a) *General Rule*. The entire Exercise Price or Purchase Price of Shares issued under the Plan shall be payable in lawful money of the United States of America at the time when such Shares are purchased, except as provided in Section 8(b) through Section 8(h) below.

(b) *Surrender of Stock*. To the extent that a Stock Option Award Agreement so provides, payment may be made all or in part by surrendering, or attesting to the ownership of,

Shares which have already been owned by the Participant or his representative. Such Shares shall be valued at their Fair Market Value on the date when the new Shares are purchased under the Plan. The Participant shall not surrender, or attest to the ownership of, Shares in payment of the Exercise Price if such action would cause the Company to recognize compensation expense (or additional compensation expense) with respect to the Option for financial reporting purposes.

(c) *Services Rendered*. At the discretion of the Committee, Shares may be awarded under the Plan in consideration of services rendered to the Company or a Subsidiary. If Shares are awarded without the payment of a Purchase Price in cash, the Committee shall make a determination (at the time of the Award) of the value of the services rendered by the Participant and the sufficiency of the consideration to meet the requirements of Section 6(b).

(d) *Cashless Exercise*. To the extent that a Stock Option Award Agreement so provides, payment may be made all or in part by delivery (on a form prescribed by the Committee) of an irrevocable direction to a securities broker to sell Shares and to deliver all or part of the sale proceeds to the Company in payment of the aggregate Exercise Price.

(e) *Exercise/Pledge*. To the extent that a Stock Option Award Agreement so provides, payment may be made all or in part by delivery (on a form prescribed by the Committee) of an irrevocable direction to a securities broker or lender to pledge Shares, as security for a loan, and to deliver all or part of the loan proceeds to the Company in payment of the aggregate Exercise Price.

(f) *Net Exercise*. To the extent that a Stock Option Award Agreement so provides, by a "net exercise" arrangement pursuant to which the number of Shares issuable upon exercise of the Option shall be reduced by the largest whole number of Shares having an aggregate Fair Market Value that does not exceed the aggregate exercise price (plus tax withholdings, if applicable) and any remaining balance of the aggregate exercise price (and/or applicable tax withholdings) not satisfied by such reduction in the number of whole Shares to be issued shall be paid by the Optionee in cash other form of payment permitted under the Stock Option Agreement.

(g) *Promissory Note*. To the extent that a Stock Option Award Agreement or Restricted Share Award Agreement so provides, payment may be made all or in part by delivering (on a form prescribed by the Company) a full-recourse promissory note.

(h) *Other Forms of Payment*. To the extent that a Stock Option Award Agreement or Restricted Share Award Agreement so provides, payment may be made in any other form that is consistent with applicable laws, regulations and rules.

(i) *Limitations under Applicable Law*. Notwithstanding anything herein or in a Stock Option Award Agreement or Restricted Share Award Agreement to the contrary, payment may not be made in any form that is unlawful, as determined by the Committee in its sole discretion.

SECTION 9. STOCK APPRECIATION RIGHTS.

(a) *SAR Award Agreement*. Each grant of a SAR under the Plan shall be evidenced by a SAR Award Agreement between the Participant and the Company. Such SAR shall be subject to all applicable terms of the Plan and may be subject to any other terms that are not inconsistent with the Plan. The provisions of the various SAR Award Agreements entered into under the Plan need not be identical.

(b) *Number of Shares*. Each SAR Award Agreement shall specify the number of Shares to which the SAR pertains and shall provide for the adjustment of such number in accordance with Section 12.

(c) *Exercise Price*. Each SAR Award Agreement shall specify the Exercise Price. The Exercise Price of a SAR shall not be less than 100% of the Fair Market Value of a Share on the date of grant. Notwithstanding the foregoing, SARs may be granted with an Exercise Price of less than 100% of the Fair Market Value per Share on the date of grant pursuant to a transaction described in, and in a manner consistent with, Section 424(a) of the Code. Subject to the foregoing in this Section 9(c), the Exercise Price under any SAR shall be determined by the Committee in its sole discretion.

(d) *Exercisability and Term*. Each SAR Award Agreement shall specify the date when all or any installment of the SAR is to become exercisable. The SAR Award Agreement shall also specify the term of the SAR. A SAR Award Agreement may provide for accelerated exercisability in the event of the Participant's death, disability or retirement or other events and may provide for expiration prior to the end of its term in the event of the termination of the Participant's service. SARs may be awarded in combination with Options, and such an Award may provide that the SARs will not be exercisable unless the related Options are forfeited. A SAR may be included in an ISO only at the time of grant but may be included in an NSO at the time of grant or thereafter. A SAR granted under the Plan may provide that it will be exercisable only in the event of a Change in Control.

(e) *Effect of Change in Control*. The Committee may determine, at the time of granting a SAR or thereafter, that such SAR shall become fully exercisable as to all Common Shares subject to such SAR in the event that a Change in Control occurs with respect to the Company.

(f) *Exercise of SARs*. Upon exercise of a SAR, the Participant (or any person having the right to exercise the SAR after his or her death) shall receive from the Company (a) Shares, (b) cash or (c) a combination of Shares and cash, as the Committee shall determine. The amount of cash and/or the Fair Market Value of Shares received upon exercise of SARs shall, in the aggregate, be equal to the amount by which the Fair Market Value (on the date of surrender) of the Shares subject to the SARs exceeds the Exercise Price.

(g) *Modification or Assumption of SARs*. Within the limitations of the Plan, the Committee may modify, extend or assume outstanding SARs or may accept the cancellation of outstanding SARs (whether granted by the Company or by another issuer) in return for the grant of new SARs for the same or a different number of shares and at the same or a different exercise price, or in return for the grant of a different Award for the same or a different number of Shares,

without stockholder approval. The foregoing notwithstanding, no modification of a SAR shall, without the consent of the holder, materially impair his or her rights or obligations under such SAR.

(h) *Buyout Provisions*. The Committee may at any time (a) offer to buy out for a payment in cash or cash equivalents a SAR previously granted, or (b) authorize a Participant to elect to cash out a SAR previously granted, in either case at such time and based upon such terms and conditions as the Committee shall establish.

SECTION 10. STOCK UNITS.

(a) *Stock Unit Award Agreement*. Each grant of Stock Units under the Plan shall be evidenced by a Stock Unit Award Agreement between the Participant and the Company. Such Stock Units shall be subject to all applicable terms of the Plan and may be subject to any other terms that are not inconsistent with the Plan. The provisions of the various Stock Unit Award Agreements entered into under the Plan need not be identical.

(b) *Payment for Awards*. To the extent that an Award is granted in the form of Stock Units, no cash consideration shall be required of the Award recipients.

(c) *Vesting Conditions*. Each Award of Stock Units may or may not be subject to vesting. Vesting shall occur, in full or in installments, upon satisfaction of the conditions specified in the Stock Unit Award Agreement. A Stock Unit Award Agreement may provide for accelerated vesting in the event of the Participant's death, disability or retirement or other events. The Committee may determine, at the time of granting Stock Units or thereafter, that all or part of such Stock Units shall become vested in the event that a Change in Control occurs with respect to the Company.

(d) *Voting and Dividend Rights*. The holders of Stock Units shall have no voting rights. Prior to settlement or forfeiture, any Stock Unit awarded under the Plan may, at the Committee's discretion, carry with it a right to dividend equivalents. Such right entitles the holder to be credited with an amount equal to all cash dividends paid on one Share while the Stock Unit is outstanding. Dividend equivalents may be converted into additional Stock Units. Settlement of dividend equivalents may be made in the form of cash, in the form of Shares, or in a combination of both. Prior to distribution, any dividend equivalents which are not paid shall be subject to the same conditions and restrictions (including without limitation, any forfeiture conditions) as the Stock Units to which they attach.

(e) *Form and Time of Settlement of Stock Units*. Settlement of vested Stock Units may be made in the form of (a) cash, (b) Shares or (c) any combination of both, as determined by the Committee. The actual number of Stock Units eligible for settlement may be larger or smaller than the number included in the original Award, based on predetermined performance factors. Methods of converting Stock Units into cash may include (without limitation) a method based on the average Fair Market Value of Shares over a series of trading days. A Stock Unit Award Agreement may provide that vested Stock Units may be settled in a lump sum or in installments. A Stock Unit Award Agreement may provide that the distribution may occur or

commence when all vesting conditions applicable to the Stock Units have been satisfied or have lapsed, or it may be deferred to any later date, subject to compliance with Section 409A of the Code. The amount of a deferred distribution may be increased by an interest factor or by dividend equivalents. Until an Award of Stock Units is settled, the number of such Stock Units shall be subject to adjustment pursuant to Section 12.

(f) *Death of Participant*. Any Stock Unit Award that becomes payable after the Participant's death shall be distributed to the Participant's beneficiary or beneficiaries. Each recipient of a Stock Unit Award under the Plan shall designate one or more beneficiaries for this purpose by filing the prescribed form with the Company. A beneficiary designation may be changed by filing the prescribed form with the Company at any time before the Participant's death. If no beneficiary was designated or if no designated beneficiary survives the Participant, then any Stock Units Award that becomes payable after the Participant's death shall be distributed to the Participant's estate.

(g) *Creditors' Rights*. A holder of Stock Units shall have no rights other than those of a general creditor of the Company. Stock Units represent an unfunded and unsecured obligation of the Company, subject to the terms and conditions of the applicable Stock Unit Award Agreement.

SECTION 11. CASH-BASED AWARDS

The Committee may, in its sole discretion, grant Cash-Based Awards to any Participant in such number or amount and upon such terms, and subject to such conditions, as the Committee shall determine at the time of grant and specify in an applicable Award Agreement. The Committee shall determine the maximum duration of the Cash-Based Award, the amount of cash which may be payable pursuant to the Cash-Based Award, the conditions upon which the Cash-Based Award shall become vested or payable, and such other provisions as the Committee shall determine. Each Cash-Based Award shall specify a cash-denominated payment amount, formula or payment ranges as determined by the Committee. Payment, if any, with respect to a Cash-Based Award shall be made in accordance with the terms of the Award and may be made in cash or in shares of Stock, as the Committee determines.

SECTION 12. ADJUSTMENT OF SHARES.

(a) *Adjustments*. In the event of a subdivision of the outstanding Stock, a declaration of a dividend payable in Shares, a declaration of a dividend payable in a form other than Shares in an amount that has a material effect on the price of Shares, a combination or consolidation of the outstanding Stock (by reclassification or otherwise) into a lesser number of Shares, a recapitalization, a spin-off or a similar occurrence, the Committee shall make appropriate and equitable adjustments in:

(i) The number of Shares available for future Awards under Section 5;

(ii) The limitations set forth in Sections 5(a) and (b) and Section 19;

(iii) The number of Shares covered by each outstanding Award; and

(iv) The Exercise Price under each outstanding Option and SAR.

(b) *Dissolution or Liquidation*. To the extent not previously exercised or settled, Options, SARs and Stock Units shall terminate immediately prior to the dissolution or liquidation of the Company.

(c) *Reorganizations*. In the event that the Company is a party to a merger or other reorganization, outstanding Awards shall be subject to the agreement of merger or reorganization. Subject to compliance with Section 409A of the Code, such agreement shall provide for:

(i) The continuation of the outstanding Awards by the Company, if the Company is a surviving corporation;

(ii) The assumption of the outstanding Awards by the surviving corporation or its parent or subsidiary;

(iii) The substitution by the surviving corporation or its parent or subsidiary of its own awards for the outstanding Awards;

(iv) Immediate vesting, exercisability and settlement of outstanding Awards followed by the cancellation of such Awards upon or immediately prior to the effectiveness of such transaction; or

(v) Settlement of the intrinsic value of the outstanding Awards (whether or not then vested or exercisable) in cash or cash equivalents or equity (including cash or equity subject to deferred vesting and delivery consistent with the vesting restrictions applicable to such Awards or the underlying Shares) followed by the cancellation of such Awards (and, for the avoidance of doubt, if as of the date of the occurrence of the transaction the Committee determines in good faith that no amount would have been attained upon the exercise of such Award or realization of the Participant's rights, then such Award may be terminated by the Company without payment); in each case without the Participant's consent. Any acceleration of payment of an amount that is subject to section 409A of the Code will be delayed, if necessary, until the earliest time that such payment would be permissible under Section 409A without triggering any additional taxes applicable under Section 409A.

The Company will have no obligation to treat all Awards, all Awards held by a Participant, or all Awards of the same type, similarly.

(d) *Reservation of Rights*. Except as provided in this Section 12, a Participant shall have no rights by reason of any subdivision or consolidation of shares of stock of any class, the payment of any dividend or any other increase or decrease in the number of shares of stock of any class. Any issue by the Company of shares of stock of any class, or securities convertible

into shares of stock of any class, shall not affect, and no adjustment by reason thereof shall be made with respect to, the number or Exercise Price of Shares subject to an Award. The grant of an Award pursuant to the Plan shall not affect in any way the right or power of the Company to make adjustments, reclassifications, reorganizations or changes of its capital or business structure, to merge or consolidate or to dissolve, liquidate, sell or transfer all or any part of its business or assets. In the event of any change affecting the Shares or the Exercise Price of Shares subject to an Award, including a merger or other reorganization, for reasons of administrative convenience, the Company in its sole discretion may refuse to permit the exercise of any Award during a period of up to thirty (30) days prior to the occurrence of such event.

SECTION 13. DEFERRAL OF AWARDS.

(a) *Committee Powers*. Subject to compliance with Section 409A of the Code, the Committee (in its sole discretion) may permit or require a Participant to:

(i) Have cash that otherwise would be paid to such Participant as a result of the exercise of a SAR or the settlement of Stock Units credited to a deferred compensation account established for such Participant by the Committee as an entry on the Company's books;

(ii) Have Shares that otherwise would be delivered to such Participant as a result of the exercise of an Option or SAR converted into an equal number of Stock Units; or

(iii) Have Shares that otherwise would be delivered to such Participant as a result of the exercise of an Option or SAR or the settlement of Stock Units converted into amounts credited to a deferred compensation account established for such Participant by the Committee as an entry on the Company's books. Such amounts shall be determined by reference to the Fair Market Value of such Shares as of the date when they otherwise would have been delivered to such Participant.

(b) *General Rules*. A deferred compensation account established under this Section 13 may be credited with interest or other forms of investment return, as determined by the Committee. A Participant for whom such an account is established shall have no rights other than those of a general creditor of the Company. Such an account shall represent an unfunded and unsecured obligation of the Company and shall be subject to the terms and conditions of the applicable agreement between such Participant and the Company. If the deferral or conversion of Awards is permitted or required, the Committee (in its sole discretion) may establish rules, procedures and forms pertaining to such Awards, including (without limitation) the settlement of deferred compensation accounts established under this Section 13.

SECTION 14. AWARDS UNDER OTHER PLANS.

The Company may grant awards under other plans or programs. Such awards may be settled in the form of Shares issued under this Plan. Such Shares shall be treated for all purposes under the Plan like Shares issued in settlement of Stock Units and shall, when issued, reduce the number of Shares available under Section 5.

SECTION 15. INDUCEMENT AWARDS POOL.

(a) *Inducement Share Reserve*. An additional pool of Shares (the "Inducement Shares") are reserved under this Plan to be used exclusively for the grant of Awards in compliance with New York Stock Exchange Rule 303A.08 (the "Inducement Awards"). The pool of Inducement Shares shall not exceed $95,000,000 in the aggregate, with the number of Shares granted based on Fair Market Value on the vesting date of the Inducement Shares or, if so provided in the Award Agreement, the volume-weighted average trading price of a Share for up to 60 days immediately preceding such vesting date. The number of Inducement Shares shall be subject to adjustment pursuant to Section 12, as applicable. For purposes of clarity, the Inducement Shares that may be awarded are in addition to and shall not reduce the number of Shares reserved under Section 5(a) for Awards other than Inducement Awards. The Shares underlying any Inducement Awards that are forfeited, canceled, held back upon exercise of an Inducement Award or settlement of an Inducement Award to cover the exercise price or tax withholding, reacquired by the Company prior to vesting, settled without the issuance of Shares or otherwise terminated (other than by exercise) shall be added back to the number of Inducement Shares available for grant under this Section 15 based on the vesting date Fair Market Value of the Inducement Shares returning to the Plan or other vesting date valuation method set forth in the Award Agreement, but shall not affect the number of Shares available for Awards under Section 5(a).

(b) *Inducement Award Rules*. Notwithstanding anything to the contrary in this Plan, an Inducement Award may be granted only to an Employee as an inducement material to the individual's entering into employment with the Company or an Affiliate within the meaning of New York Stock Exchange Rule 303A.08 and only if such individual has not previously been an Employee or has experienced a bona fide period of interruption of employment with the Company and its Affiliates prior to grant of the Inducement Award. In addition, notwithstanding any other provision of the Plan to the contrary, all such Inducement Awards must be granted by the Committee. No Inducement Award may be an ISO.

SECTION 16. PAYMENT OF DIRECTOR'S FEES IN SECURITIES.

(a) *Effective Date*. No provision of this Section 16 shall be effective unless and until the Board has determined to implement such provision.

(b) *Elections to Receive NSOs, SARs, Restricted Shares or Stock Units*. An Outside Director may elect to receive his or her annual retainer payments and/or meeting fees from the Company in the form of cash, NSOs, SARs, Restricted Shares or Stock Units, or a combination thereof, as determined by the Board. Alternatively, the Board may mandate payment in any of such alternative forms. Such NSOs, SARs, Restricted Shares and Stock Units shall be issued under the Plan. An election under this Section 16 shall be filed with the Company on the prescribed form.

(c) *Number and Terms of NSOs, SARs, Restricted Shares or Stock Units*. The number of NSOs, SARs, Restricted Shares or Stock Units to be granted to Outside Directors in lieu of annual retainers and meeting fees that would otherwise be paid in cash shall be calculated in a manner determined by the Board. The terms of such NSOs, SARs, Restricted Shares or Stock Units shall also be determined by the Board.

SECTION 17. LEGAL AND REGULATORY REQUIREMENTS.

Shares shall not be issued under the Plan unless the issuance and delivery of such Shares complies with (or is exempt from) all applicable requirements of law, including (without limitation) the Securities Act of 1933, as amended, the rules and regulations promulgated thereunder, state securities laws and regulations and the regulations of any stock exchange on which the Company's securities may then be listed, and the Company has obtained the approval or favorable ruling from any governmental agency which the Company determines is necessary or advisable. The Company shall not be liable to a Participant or other persons as to: (a) the non-issuance or sale of Shares as to which the Company has not obtained from any regulatory body having jurisdiction the authority deemed by the Company's counsel to be necessary to the lawful issuance and sale of any Shares under the Plan; and (b) any tax consequences expected, but not realized, by any Participant or other person due to the receipt, exercise or settlement of any Award granted under the Plan.

SECTION 18. TAXES.

(a) *Withholding Taxes*. To the extent required by applicable federal, state, local or foreign law, a Participant or his or her successor shall make arrangements satisfactory to the Company for the satisfaction of any withholding tax obligations that arise in connection with the Plan. The Company shall not be required to issue any Shares or make any cash payment under the Plan until such obligations are satisfied.

(b) *Share Withholding*. The Committee may permit a Participant to satisfy all or part of his or her withholding or income tax obligations by having the Company withhold all or a portion of any Shares that otherwise would be issued to him or her or by surrendering all or a portion of any Shares that he or she previously acquired. Such Shares shall be valued at their Fair Market Value on the date when taxes otherwise would be withheld in cash. In no event may a Participant have Shares withheld that would otherwise be issued to him or her in excess of the number necessary to satisfy the minimum legally required tax withholding.

(c) *Section 409A*. Each Award that provides for "nonqualified deferred compensation" within the meaning of Section 409A of the Code shall be subject to such additional rules and requirements as specified by the Committee from time to time in order to comply with Section 409A. If any amount under such an Award is payable upon a "separation from service" (within the meaning of Section 409A) to a Participant who is then considered a "specified employee" (within the meaning of Section 409A), then no such payment shall be made prior to the date that is the earlier of (i) six months and one day after the Participant's separation from service, or (ii) the Participant's death, but only to the extent such delay is necessary to prevent such payment from being subject to interest, penalties and/or additional tax

imposed pursuant to Section 409A. In addition, the settlement of any such Award may not be accelerated except to the extent permitted by Section 409A.

SECTION 19. TRANSFERABILITY.

Unless the agreement evidencing an Award (or an amendment thereto authorized by the Committee) expressly provides otherwise, no Award granted under this Plan, nor any interest in such Award, may be sold, assigned, conveyed, gifted, pledged, hypothecated or otherwise transferred in any manner (prior to the vesting and lapse of any and all restrictions applicable to Shares issued under such Award), other than by will or the laws of descent and distribution; provided, however, that an ISO may be transferred or assigned only to the extent consistent with Section 422 of the Code. Any purported assignment, transfer or encumbrance in violation of this Section 19 shall be void and unenforceable against the Company.

SECTION 20. PERFORMANCE BASED AWARDS.

The number of Shares or other benefits granted, issued, retainable and/or vested under an Award may be made subject to the attainment of performance goals. The Committee may utilize any performance criteria selected by it in its sole discretion to establish performance goals; provided, however, that in the case of any Performance Based Award, the following conditions shall apply:

(i) The amount potentially available under a Performance Based Award shall be subject to the attainment of pre-established, objective performance goals relating to a specified period of service including but not limited to any of the following performance criteria: (a) cash flow, (b) earnings per share, (c) earnings before interest, taxes and amortization, (d) return on equity, (e) total stockholder return, (f) share price performance, (g) return on capital, (h) return on assets or net assets, (i) revenue, (j) income or net income, (k) operating income or net operating income, (l) operating profit or net operating profit, (m) operating margin or profit margin, (n) return on operating revenue, (o) return on invested capital, (p) market segment shares, (q) costs, (r) expenses, (s) initiation or completion of research activities, (t) initiation or completion of development programs, (u) other milestones with respect to research activities or development programs, (v) regulatory body approval, (w) implementation or completion of critical projects, (x) commercial milestones or (z) other milestones with respect to the growth of the Company's business or the development or commercialization of any product or service ("Qualifying Performance Criteria"), any of which may be measured either individually, alternatively or in any combination, applied to either the Company as a whole or to a business unit or Subsidiary, either individually, alternatively or in any combination, and measured either annually or cumulatively over a period of years, on an absolute basis or relative to a pre-established target, to previous years' results or to a designated comparison group or index, in each case as specified by the Committee in the Award;

(ii) The Committee may appropriately adjust the method of evaluating performance under a Qualifying Performance Criteria for a performance period as follows: (i) to exclude asset write-downs, (ii) to exclude litigation or claim judgments or settlements, (iii) to exclude the effect of changes in tax law, accounting principles or other such laws or provisions affecting reported results, (iv) to exclude accruals for reorganization and restructuring programs, (v) to exclude any extraordinary nonrecurring items as determined under generally accepted accounting principles and/or described in managements' discussion and analysis of financial condition and results of operations appearing in the Company's annual report to stockholders for the applicable year, (vi) to exclude the dilutive effects of acquisitions or joint ventures, (vii) to assume that any business divested by the Company achieved performance objectives at targeted levels during the balance of a performance period following such divestiture, (viii) to exclude the effect of any change in the outstanding shares of common stock of the Company by reason of any stock dividend or split, stock repurchase, reorganization, recapitalization, merger, consolidation, spin-off, combination or exchange of shares or other similar corporate change, or any distributions to common stockholders other than regular cash dividends, (ix) to exclude the effects of stock based compensation and the award of bonuses under the Company's bonus plans; and (x) to exclude costs incurred in connection with potential acquisitions or divestitures that are required to be expensed under generally accepted accounting principles;

(iii) The Committee shall establish the applicable performance goals in writing and an objective method for determining the Award earned by a Participant if the goals are attained, while the outcome is substantially uncertain, and shall determine and certify in writing, for each Participant, the extent to which the performance goals have been met prior to payment or vesting of the Award; and

(iv) The maximum aggregate number of Shares that may be subject to Performance Based Awards granted to a Participant in any calendar year (other than Inducement Awards) is 2,000,000 Shares, and no more than two times this amount in the first year of employment (subject to adjustment under Section 12), and the maximum aggregate amount of cash that may be payable to a Participant under Performance Based Awards granted to a Participant in any calendar year that are Cash-Based Awards is $10,000,000.

SECTION 21. NO EMPLOYMENT RIGHTS.

No provision of the Plan, nor any Award granted under the Plan, shall be construed to give any person any right to become, to be treated as, or to remain an Employee or Consultant.

The Company and its Subsidiaries reserve the right to terminate any person's Service at any time and for any reason, with or without notice.

SECTION 22. DURATION AND AMENDMENTS.

(a) *Term of the Plan*. The Plan, as set forth herein, shall come into existence on the date of its adoption by the Board of Directors; provided, however, that no Award may be granted hereunder prior to the Effective Date. The Board of Directors may suspend or terminate the Plan at any time. No ISOs may be granted after the tenth anniversary of the earlier of (i) the date the Plan is adopted by the Board of Directors, or (ii) the date the Plan is approved the stockholders of the Company.

(b) *Right to Amend the Plan*. The Board of Directors may amend the Plan at any time and from time to time. Rights and obligations under any Award granted before amendment of the Plan shall not be materially impaired by such amendment, except with consent of the Participant. An amendment of the Plan shall be subject to the approval of the Company's stockholders only to the extent required by applicable laws, regulations or rules.

(c) *Effect of Termination*. No Awards shall be granted under the Plan after the termination thereof. The termination of the Plan shall not affect Awards previously granted under the Plan.

SECTION 23. EXECUTION.

To record the amendment and restatement of the Plan by the Board of Directors, the Company has caused its authorized officer to execute the same.

INVITAE CORPORATION

By: /s/ Thomas Brida
Name : Thomas Brida
Title: General Counsel and Secretary

Exhibit 31.1

PRINCIPAL EXECUTIVE OFFICER'S CERTIFICATION PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Sean E. George, certify that:

1. I have reviewed this quarterly report on Form 10-Q of Invitae Corporation for the period ended March 31, 2020;

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(s) 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, including its consolidated subsidiaries, 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(s) 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.

Dated: May 8, 2020

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

Sean E. George, Ph.D.

Chief Executive Officer and Director

(Principal Executive Officer)

Exhibit 31.2

PRINCIPAL FINANCIAL AND ACCOUNTING OFFICER'S CERTIFICATION PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Shelly D. Guyer, certify that:

1. I have reviewed this quarterly report on Form 10-Q of Invitae Corporation for the period ended March 31, 2020;
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(s) 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, including its consolidated subsidiaries, 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(s) 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.

Dated: May 8, 2020

/s/ Shelly D. Guyer

Shelly D. Guyer

Chief Financial Officer

(Principal Financial and Accounting Officer)

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 of Invitae Corporation (the "Company") on Form 10-Q for the period ended March 31, 2020, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), the undersigned officer of the Company certifies, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that, to such officer's knowledge:

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

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

Dated: May 8, 2020

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

Sean E. George, Ph.D.
Chief Executive Officer and Director
(Principal Executive Officer)

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 of Invitae Corporation (the "Company") on Form 10-Q for the period ended March 31, 2020, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), the undersigned officer of the Company certifies, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that, to such officer's knowledge:

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

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

Dated: May 8, 2020

/s/ Shelly D. Guyer

Shelly D. Guyer
Chief Financial Officer
(Principal Financial and Accounting Officer)