# 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, 2023**

☐ **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 5, 2023 was 260,674,728.

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## PART I — Financial Information

### ITEM 1. Condensed Consolidated Financial Statements

**INVITAE CORPORATION**

**Condensed Consolidated Balance Sheets**

**(in thousands)**
**(unaudited)**

| | March 31, 2023 | December 31, 2022 |
|---|---|---|
| **Assets** | | |
| Current assets: | | |
| Cash and cash equivalents | $ 161,197 | $ 257,489 |
| Marketable securities | 217,501 | 289,611 |
| Accounts receivable | 85,592 | 96,148 |
| Inventory | 19,070 | 30,386 |
| Prepaid expenses and other current assets | 20,908 | 19,496 |
| Total current assets | 504,268 | 693,130 |
| Property and equipment, net | 95,445 | 108,723 |
| Operating lease assets | 78,051 | 106,563 |
| Restricted cash | 10,034 | 10,030 |
| Intangible assets, net | 981,888 | 1,012,549 |
| Other assets | 21,977 | 23,121 |
| Total assets | $ 1,691,663 | $ 1,954,116 |
| **Liabilities and stockholders' (deficit) equity** | | |
| Current liabilities: | | |
| Accounts payable | $ 11,903 | $ 13,984 |
| Accrued liabilities | 85,131 | 74,388 |
| Operating lease obligations | 16,374 | 14,600 |
| Finance lease obligations | 4,870 | 5,121 |
| Convertible senior secured notes, current portion (at fair value) | 71,902 | — |
| Total current liabilities | 190,180 | 108,093 |
| Operating lease obligations, net of current portion | 143,744 | 134,386 |
| Finance lease obligations, net of current portion | 2,529 | 3,780 |
| Debt | — | 122,333 |
| Convertible senior notes, net | 1,169,374 | 1,470,783 |
| Convertible senior secured notes, net of current portion (at fair value) | 211,036 | — |
| Deferred tax liability | 7,130 | 8,130 |
| Other long-term liabilities | 4,326 | 4,775 |
| Total liabilities | 1,728,319 | 1,852,280 |
| Commitments and contingencies (Note 7) | | |
| Stockholders' (deficit) equity: | | |
| Common stock | 26 | 25 |
| Accumulated other comprehensive loss | (108) | (80) |
| Additional paid-in capital | 4,984,750 | 4,931,032 |
| Accumulated deficit | (5,021,324) | (4,829,141) |
| Total stockholders' (deficit) equity | (36,656) | 101,836 |
| Total liabilities and stockholders' (deficit) equity | $ 1,691,663 | $ 1,954,116 |

See accompanying notes to unaudited condensed consolidated financial statements.

**INVITAE CORPORATION**

**Condensed Consolidated Statements of Operations**

**(in thousands, except per share data)**
**(unaudited)**

| | Three Months Ended March 31, | |
|---|---|---|
| | 2023 | 2022 |
| Revenue: | | |
| Test revenue | $ 112,623 | $ 119,497 |
| Other revenue | 4,733 | 4,194 |
| Total revenue | 117,356 | 123,691 |
| Operating expenses: | | |
| Cost of revenue | 88,442 | 97,116 |
| Research and development | 61,978 | 128,236 |
| Selling and marketing | 44,510 | 60,144 |
| General and administrative | 45,241 | 51,428 |
| Restructuring and other costs | 52,556 | — |
| Total operating expenses | 292,727 | 336,924 |
| Loss from operations | (175,371) | (213,233) |
| Other (expense) income, net: | | |
| Loss on extinguishment of debt, net | (10,822) | — |
| Debt issuance costs | (19,859) | — |
| Change in fair value of convertible senior secured notes | 18,304 | — |
| Change in fair value of acquisition-related liabilities | 218 | 10,003 |
| Other income, net | 5,883 | 436 |
| Total other (expense) income, net | (6,276) | 10,439 |
| Interest expense | (11,496) | (13,985) |
| Net loss before taxes | (193,143) | (216,779) |
| Income tax benefit | 960 | 34,920 |
| Net loss | $ (192,183) | $ (181,859) |
| Net loss per share, basic and diluted | $ (0.77) | $ (0.80) |
| Shares used in computing net loss per share, basic and diluted | 249,907 | 228,470 |

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, | |
|---|---|---|
| | 2023 | 2022 |
| Net loss | $ (192,183) | $ (181,859) |
| Other comprehensive income (loss): | | |
| Unrealized income (loss) on available-for-sale marketable securities, net of tax | 143 | (778) |
| Changes in fair value attributable to instrument-specific credit risk of convertible senior secured notes measured at fair value, net of tax | (171) | — |
| Comprehensive loss | $ (192,211) | $ (182,637) |

See accompanying notes to unaudited condensed consolidated financial statements.

**INVITAE CORPORATION**

**Condensed Consolidated Statements of Stockholders' (Deficit) Equity**

**(in thousands)**
**(unaudited)**

| | Three Months Ended March 31, | |
|---|---|---|
| | **2023** | **2022** |
| Common stock: | | |
| Balance, beginning of period | $ 25 | $ 23 |
| Common stock issued | 1 | — |
| Balance, end of period | 26 | 23 |
| | | |
| Accumulated other comprehensive loss: | | |
| Balance, beginning of period | (80) | (7) |
| Unrealized income (loss) on available-for-sale marketable securities, net of tax | 143 | (778) |
| Changes in fair value attributable to instrument-specific credit risk of convertible senior secured notes measured at fair value, net of tax | (171) | — |
| Balance, end of period | (108) | (785) |
| | | |
| Additional paid-in capital: | | |
| Balance, beginning of period | 4,931,032 | 4,701,230 |
| Common stock issued in connection with the exchange of convertible senior notes due 2024 | 23,461 | — |
| Common stock issued on exercise of stock options, net | 1 | 425 |
| Common stock and equity awards issued pursuant to acquisitions | 1,063 | 1,660 |
| Stock-based compensation expense | 29,193 | 46,087 |
| Balance, end of period | 4,984,750 | 4,749,402 |
| | | |
| Accumulated deficit: | | |
| Balance, beginning of period | (4,829,141) | (1,722,848) |
| Net loss | (192,183) | (181,859) |
| Balance, end of period | (5,021,324) | (1,904,707) |
| Total stockholders' (deficit) equity | $ (36,656) | $ 2,843,933 |

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, | |
|---|---|---|
| | **2023** | **2022** |
| **Cash flows from operating activities:** | | |
| Net loss | $ (192,183) | $ (181,859) |
| Adjustments to reconcile net loss to net cash used in operating activities: | | |
| Impairments and losses on disposals of long-lived assets, net | 50,354 | — |
| Depreciation and amortization | 34,963 | 27,100 |
| Stock-based compensation | 29,193 | 46,822 |
| Amortization of debt discount and issuance costs | 3,022 | 3,883 |
| Loss on extinguishment of debt, net | 10,822 | — |
| Debt issuance costs | 19,859 | — |
| Change in fair value of convertible senior secured notes | (18,304) | — |
| Remeasurements of liabilities associated with business combinations | (218) | (10,003) |
| Benefit from income taxes | (960) | (34,920) |
| Post-combination expense for acceleration of unvested equity and deferred stock compensation | 830 | 1,660 |
| Amortization of premiums and discounts on investment securities | (2,949) | 570 |
| Non-cash lease expense | 3,111 | 1,286 |
| Other | 824 | 674 |
| Changes in operating assets and liabilities, net of businesses acquired: | | |
| Accounts receivable | 10,556 | (14,172) |
| Inventory | 11,316 | (9,941) |
| Prepaid expenses and other current assets | (1,412) | 1,654 |
| Other assets | 163 | (1,984) |
| Accounts payable | (1,942) | 22,863 |
| Accrued expenses and other long-term liabilities | 8,557 | (1,176) |
| Net cash used in operating activities | (34,398) | (147,543) |
| **Cash flows from investing activities:** | | |
| Purchases of marketable securities | (126,053) | (550,541) |
| Proceeds from maturities of marketable securities | 201,255 | 121,933 |
| Purchases of property and equipment | (1,324) | (20,848) |
| Net cash provided by (used in) investing activities | 73,878 | (449,456) |
| **Cash flows from financing activities:** | | |
| Proceeds from issuance of common stock, net | 1 | 425 |
| Proceeds from issuance of Series B convertible senior secured notes due 2028 | 30,000 | — |
| Payments for debt issuance costs and prepayment fees | (28,014) | — |
| Repayment of debt | (135,000) | — |
| Finance lease principal payments | (1,289) | (1,330) |
| Settlement of acquisition obligations | (1,466) | (15) |
| Net cash used in financing activities | (135,768) | (920) |
| **Net decrease in cash, cash equivalents and restricted cash** | (96,288) | (597,919) |
| **Cash, cash equivalents and restricted cash at beginning of period** | 267,519 | 933,525 |
| **Cash, cash equivalents and restricted cash at end of period** | $ 171,231 | $ 335,606 |
| | | |
| **Supplemental cash flow information of non-cash investing and financing activities:** | | |
| Equipment acquired through finance leases | $ — | $ 4,472 |
| Purchases of property and equipment in accounts payable and accrued liabilities | $ 579 | $ 11,675 |
| Common stock issued for acquisition of businesses | $ 233 | $ — |
| Exchange of convertible senior notes due 2024 | $ (302,941) | $ — |
| Exchange for convertible senior secured notes due 2028 | $ 301,071 | $ — |

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 we changed our name to Invitae Corporation in 2012. We offer high-quality, comprehensive, affordable genetic testing across multiple clinical areas, including hereditary cancer, precision oncology, women's health, rare diseases and pharmacogenomics. To augment our portfolio and realize our mission, we have previously acquired multiple assets and businesses that further expanded our test menu and suite of digital health and offerings and accelerated our entry into key genomics markets. We are building a platform to harness genetics to diagnose more patients correctly and earlier, while enabling our strategic partners to bring therapies to market faster. Invitae operates in one segment.

### *Strategic realignment*

On July 18, 2022, the Company initiated a strategic realignment of our operations and began implementing cost reduction programs to prioritize its core genetic testing and digital health and data platforms, which was approved by the board of directors of the Company on July 16, 2022. See Note 10, "Restructuring and other costs" for additional information regarding our strategic realignment.

### *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, 2022. The results for the three months ended March 31, 2023 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, restricted cash, marketable securities and accounts receivable. Our cash and cash equivalents are primarily held by financial institutions in the United States. Such deposits may exceed federally insured limits.

***Cash, cash equivalents and restricted cash***

Cash, cash equivalents and restricted cash reported within the condensed consolidated balance sheets are reconciled to the amounts reported in the condensed consolidated statements of cash flows as follows (in thousands):

| | March 31, 2023 | March 31, 2022 |
|---|---|---|
| Cash and cash equivalents | $ 161,197 | $ 325,331 |
| Restricted cash | 10,034 | 10,275 |
| Total cash, cash equivalents and restricted cash | $ 171,231 | $ 335,606 |

***Fair value of financial instruments***

Our financial instruments consist principally of cash and cash equivalents, marketable securities, accounts receivable, accounts payable, accrued liabilities, operating and finance leases obligations, liabilities associated with business combinations, and convertible senior notes. 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 operating and finance leases approximates their fair values. Liabilities associated with business combinations and the convertible senior secured notes due 2028 are recorded at their estimated fair value.

***Fair value option election***

The fair value option provides an election that allows an entity to irrevocably elect to record certain financial assets and liabilities at fair value on an instrument-by-instrument basis at initial recognition. We have elected to apply the fair value option to our 4.50% Series A and B convertible senior secured notes due 2028 (collectively, the "Senior Secured 2028 Notes") and stock payable liabilities resulting from business combinations.

The convertible senior secured notes accounted for under the fair value option election pursuant to Accounting Standards Codification ("ASC") 825, *Financial Instruments,* are each a debt host financial instrument containing embedded features which would otherwise be required to be bifurcated from the debt-host and recognized as separate derivative liabilities subject to initial and recurring estimated fair value measurements under ASC 815, *Derivatives and Hedging*. Notwithstanding, ASC 825 provides for the fair value option election, to the extent not otherwise prohibited by ASC 825, to be afforded to financial instruments. When the fair value option election is applied to financial liabilities, bifurcation of an embedded derivative is not required, and the financial liability is initially measured at its issue-date estimated fair value and then subsequently remeasured at estimated fair value on a recurring basis as of each reporting period date. The estimated fair value adjustment related to the portion of the change in fair value attributed to a change in the instrument-specific credit risk is recognized as a component of other comprehensive loss, with the remaining amount of the fair value adjustment recognized in other (expense) income, net in our condensed consolidated statements of operations. We have elected to present the component related to accrued interest in the change in fair value of the Senior Secured 2028 Notes.

In circumstances where an acquisition involves certain indemnification hold-backs that are settled in shares of our common stock, we recognize a stock payable liability 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. We remeasure this liability each reporting period and record changes in the fair value related to stock payable liabilities in other income (expense), net in our condensed consolidated statements of operations.

***Restructuring and other costs***

Restructuring and other costs are comprised of employee severance and benefits, asset impairments and losses on asset disposals, and other costs primarily related to implementing our strategic realignment. Employee severance and benefit costs are comprised of severance, other termination benefit costs, and stock-based compensation expense for the acceleration of stock awards related to workforce reductions. We recognize costs and liabilities associated with exit and disposal activities in accordance with ASC 420, *Exit and Disposal Cost Obligations,* and other costs and liabilities associated with nonretirement postemployment benefits in accordance with ASC 712, *Nonretirement Postemployment Benefits*. Liabilities are based on the estimate of fair value in the period the liabilities are incurred, with subsequent changes to the liability recognized as adjustments in the period of change. We recognize losses on asset disposals in accordance with ASC 360, *Impairment or Disposal of Long-*

*Lived Assets*. Restructuring and other costs are recognized as an operating expense within the condensed consolidated statements of operations and related liabilities are recorded within accrued liabilities in the condensed consolidated balance sheets.

***Recent accounting pronouncements***

We evaluate all Accounting Standards Updates (“ASUs”) issued by the Financial Accounting Standards Board (the "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 condensed consolidated financial statements.

*Recently adopted accounting pronouncements*

In October 2021, the FASB issued ASU 2021-08, *Business Combinations ("Topic 805"): Accounting for Contract Assets and Contract Liabilities from Contracts with Customers.* The amendments of this ASU require entities to recognize and measure contract assets and contract liabilities acquired in a business combination in accordance with ASC 606, *Revenue from Contracts with Customers*. The Company adopted the amendments in this update on January 1, 2023 with no impact to our consolidated financial statements at the date of adoption. The amendments will be applied prospectively to future business combinations.

**3. Revenue, accounts receivable and deferred revenue**

Test revenue is generated from sales of diagnostic tests and precision oncology products to two groups of customers: patients, consideration for which may be paid directly by the patients or the patients' insurance carriers, and institutions (e.g., hospitals, clinics, medical centers and biopharmaceutical partners). Amounts billed and collected, and the timing of collections, vary based on the type of customer and the corresponding payer, including the patients' insurance carriers that are paying on behalf of the customer. Data and service revenue consists principally of revenue recognized for the performance of activities outlined in biopharmaceutical development contracts and other collaboration and genome network agreements.

The following tables present disaggregated revenue by customer and product offering by category (in thousands):

| | Patient | | | Three Months Ended March 31, 2023 |
|---|---|---|---|---|
| | Insurance | Direct | Institution | |
| Product: | | | | |
| Oncology | $ 50,615 | $ 1,705 | $ 7,986 | $ 60,306 |
| Women's health | 20,210 | 3,412 | 1,259 | 24,881 |
| Rare diseases | 11,427 | 2,389 | 6,316 | 20,132 |
| Data/services | — | — | 12,037 | 12,037 |
| Total revenue | $ 82,252 | $ 7,506 | $ 27,598 | $ 117,356 |

| | Patient | | | Three Months Ended March 31, 2022 |
|---|---|---|---|---|
| | Insurance | Direct | Institution | |
| Product: | | | | |
| Oncology | $ 48,538 | $ 3,436 | $ 20,201 | $ 72,175 |
| Women's health | 16,765 | 6,004 | 2,022 | 24,791 |
| Rare diseases | 6,601 | 2,717 | 6,265 | 15,583 |
| Data/services | — | — | 11,142 | 11,142 |
| Total revenue | $ 71,904 | $ 12,157 | $ 39,630 | $ 123,691 |

We recognize revenue related to billings based on estimates of the amount that will ultimately be realized. Cash collections for certain tests delivered may differ from rates originally estimated. In subsequent periods, we update our estimate of the amounts recognized for previously delivered tests resulting in the following (decreases) increases to revenue and (decreases) increases to our net (loss) income from operations and basic and diluted net (loss) income per share (in millions, except per share data):

| | Three Months Ended March 31, | |
|---|---|---|
| | 2023 | 2022 |
| Revenue | $ (3.0) | $ 1.1 |
| (Loss) income from operations | $ (3.0) | $ 1.1 |
| Net (loss) income per share, basic and diluted | $ (0.01) | $ 0.00 |

***Accounts receivable***

The majority of our accounts receivable represents amounts billed to customers for test and data and service activities, and estimated amounts to be collected from patients' insurance carriers for test services.

We record a contract asset for services delivered under certain biopharmaceutical contracts, which are unbilled as of the end of the period. The contract receivable was $1.1 million and $1.3 million as of March 31, 2023 and December 31, 2022, respectively, and was included in prepaid expenses and other current assets in the condensed consolidated balance sheets.

***Deferred revenue***

We record a contract liability when cash payments are received or due in advance of our performance related to one or more performance obligations. The deferred revenue balance primarily consists of advanced billings for biopharmaceutical development services, including billings at the initiation of performance-based milestones, and recognized as revenue in the applicable future period when the revenue is earned. Also included are prepayments related to our consumer direct channel. We recognized revenue of $2.1 million from deferred revenue during the three months ended March 31, 2023. The current contract liability was $5.7 million and $4.8 million as of March 31, 2023 and December 31, 2022, respectively, which was included in accrued liabilities in the condensed consolidated balance sheets. The long-term contract liability was $36 thousand and $0.1 million at March 31, 2023 and December 31, 2022, respectively, and was included in other long-term liabilities in the condensed consolidated balance sheets.

***Refund liability***

As part of our strategic realignment, we terminated early or changed the scope of several companion diagnostic development contracts with milestones in progress. Upon termination, we recorded a refund liability related to the remaining outstanding performance-based milestones. During the three months ended March 31, 2023, we recorded settlement activity associated with the early termination of a companion diagnostic contract. The refund liability was $2.5 million and $4.7 million as of March 31, 2023 and December 31, 2022, respectively, which was included in accrued liabilities in the condensed consolidated balance sheets.

***Performance obligations***

Test and other revenue are generally recognized upon completion of our performance obligation when or as control of the promised good or service is transferred to the customer, which is typically a test report, or upon shipment of our precision oncology products or other contractually defined milestone(s). The Company has applied the practical expedient in relation to information about our remaining performance obligations, as we have a right to consideration from a customer in an amount that corresponds directly with the value to the customer of the Company’s performance completed to date. Most remaining performance obligations are primarily related to Personalized Cancer Monitoring ("PCM") services included in test revenue in our condensed consolidated statement of operations and are generally satisfied over one to six months.

**4. Intangible assets**

The following table presents details of our acquired intangible assets as of March 31, 2023 (in thousands):

| | March 31, 2023 | | | | |
|---|---|---|---|---|---|
| | Cost | Accumulated Amortization | Asset Disposals | Net | Weighted-Average Useful Life (In Years) |
| Customer relationships | $ 40,928 | $ (18,577) | $ — | $ 22,351 | 10.8 |
| Developed technology | 1,138,702 | (193,796) | (2,051) | 942,855 | 10.8 |
| Trade name | 21,072 | (4,390) | — | 16,682 | 12.0 |
| | $ 1,200,702 | $ (216,763) | $ (2,051) | $ 981,888 | 10.8 |

The following table presents details of our acquired intangible assets as of December 31, 2022 (in thousands):

| | December 31, 2022 | | | | |
|---|---|---|---|---|---|
| | Cost | Accumulated Amortization | Asset Disposals | Net | Weighted-Average Useful Life (In Years) |
| Customer relationships | $ 41,515 | $ (17,675) | $ (359) | $ 23,481 | 10.8 |
| Developed technology | 1,174,506 | (183,133) | (19,426) | 971,947 | 10.8 |
| Non-compete agreement | 286 | (286) | — | — | — |
| Trade name | 21,085 | (3,964) | — | 17,121 | 12.0 |
| Patent assets and licenses | 495 | (156) | (339) | — | — |
| Right to develop new technology | 19,359 | (2,474) | (16,885) | — | — |
| | $ 1,257,246 | $ (207,688) | $ (37,009) | $ 1,012,549 | 10.8 |

Acquisition-related intangibles included in the above tables are generally finite-lived 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 expected to be realized. Amortization expense was $28.6 million and $20.2 million for the three months ended March 31, 2023 and 2022, respectively. Amortization expense is recorded in cost of revenue, research and development, and selling and marketing expense in our condensed consolidated statements of operations.

In March 2023, we decided to cease development of acquired technology focused on informing clinical decisions as management continued to evaluate its investments in development. During the three months ended March 31, 2023, we wrote-off the remaining carrying value of the related developed technology intangible asset of $2.1 million and recognized $1.0 million for related contractual obligations, which are included in restructuring and other costs in the condensed consolidated statements of operations. See Note 10, "Restructuring and other costs" for additional information.

The following table summarizes our estimated future amortization expense of intangible assets with finite lives as of March 31, 2023 (in thousands):

| | |
|---|---|
| 2023 (remainder of year) | $ 85,559 |
| 2024 | 113,800 |
| 2025 | 112,046 |
| 2026 | 112,012 |
| 2027 | 111,346 |
| Thereafter | 447,125 |
| Total estimated future amortization expense | $ 981,888 |

## 5. Balance sheet components

### *Inventory*

Inventory consisted of the following (in thousands):

| | March 31, 2023 | December 31, 2022 |
|---|---|---|
| Raw materials | $ 18,913 | $ 29,992 |
| Work in progress | 157 | 382 |
| Finished goods | — | 12 |
| Total inventory | $ 19,070 | $ 30,386 |

### *Property and equipment, net*

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

| | March 31, 2023 | December 31, 2022 |
|---|---|---|
| Leasehold improvements | $ 72,184 | $ 73,095 |
| Laboratory equipment | 62,267 | 67,261 |
| Computer equipment | 13,368 | 13,511 |
| Furniture and fixtures | 1,364 | 1,427 |
| Construction-in-progress | 14,186 | 21,006 |
| Other | 5,955 | 2,996 |
| Total property and equipment, gross | 169,324 | 179,296 |
| Accumulated depreciation | (73,879) | (70,573) |
| Total property and equipment, net | $ 95,445 | $ 108,723 |

Depreciation expense was $5.4 million and $5.6 million for the three months ended March 31, 2023 and 2022, respectively.

During the first quarter of 2023, we decided to exit certain leased premises and we recognized a loss on disposal of property and equipment, net of $8.5 million during the three months ended March 31, 2023 for related lab equipment and leasehold improvements, which is included in restructuring and other costs in our condensed consolidated statement of operations. See Note 7, "Commitments and contingencies" and Note 10, "Restructuring and other costs" for additional information.

### *Accrued liabilities*

Accrued liabilities consisted of the following (in thousands):

| | March 31, 2023 | December 31, 2022 |
|---|---|---|
| Accrued compensation and related expenses | $ 33,424 | $ 25,315 |
| Accrued expenses | 32,394 | 23,628 |
| Compensation and other liabilities associated with business combinations | 3,881 | 5,335 |
| Deferred revenue | 5,721 | 4,814 |
| Accrued interest | 62 | 6,646 |
| Accrued royalties | 2,421 | 3,177 |
| Other accrued liabilities | 7,228 | 5,473 |
| Total accrued liabilities | $ 85,131 | $ 74,388 |

## 6. 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 financial instruments that were measured at fair value on a recurring basis (in thousands):

| | March 31, 2023 | | | | | | |
|---|---|---|---|---|---|---|---|
| | Amortized Cost | Gross Unrealized Gains | Gross Unrealized Losses | Estimated Fair Value | Level 1 | Level 2 | Level 3 |
| **Financial assets:** | | | | | | | |
| Money market funds | $ 169,399 | $ — | $ — | $ 169,399 | $ 169,399 | $ — | $ — |
| U.S. Treasury notes | 33,042 | 11 | — | 33,053 | 33,053 | — | — |
| U.S. government agency securities | 184,395 | 53 | — | 184,448 | — | 184,448 | — |
| Total financial assets | $ 386,836 | $ 64 | $ — | $ 386,900 | $ 202,452 | $ 184,448 | $ — |
| | | | | | | | |
| **Financial liabilities:** | | | | | | | |
| Stock payable liability | | | | $ 300 | $ — | $ — | $ 300 |
| Contingent consideration | | | | 25 | — | — | 25 |
| Convertible senior secured notes | | | | 282,938 | — | — | 282,938 |
| Total financial liabilities | | | | $ 283,263 | $ — | $ — | $ 283,263 |

| | March 31, 2023 |
|---|---|
| Reported as: | |
| Cash equivalents | $ 159,365 |
| Restricted cash | 10,034 |
| Marketable securities | 217,501 |
| Total cash equivalents, restricted cash, and marketable securities | $ 386,900 |
| | |
| Convertible senior secured notes, current portion | $ 71,902 |
| Convertible senior secured notes, net of current portion | 211,036 |
| Other long-term liabilities | 325 |
| Total liabilities | $ 283,263 |

| | December 31, 2022 | | | | | | |
|---|---|---|---|---|---|---|---|
| | Amortized Cost | Gross Unrealized Gains | Gross Unrealized Losses | Estimated Fair Value | Level 1 | Level 2 | Level 3 |
| **Financial assets:** | | | | | | | |
| Money market funds | $ 158,931 | $ — | $ — | $ 158,931 | $ 158,931 | $ — | $ — |
| U.S. Treasury notes | 193,685 | 1 | (123) | 193,563 | 193,563 | — | — |
| U.S. government agency securities | 96,006 | 55 | (13) | 96,048 | — | 96,048 | — |
| Total financial assets | $ 448,622 | $ 56 | $ (136) | $ 448,542 | $ 352,494 | $ 96,048 | $ — |
| | | | | | | | |
| **Financial liabilities:** | | | | | | | |
| Stock payable liability | | | | $ 744 | $ — | $ — | $ 744 |
| Contingent consideration | | | | 25 | — | — | 25 |
| Total financial liabilities | | | | $ 769 | $ — | $ — | $ 769 |

| | December 31, 2022 |
|---|---|
| Reported as: | |
| Cash equivalents | $ 148,901 |
| Restricted cash | 10,030 |
| Marketable securities | 289,611 |
| Total cash equivalents, restricted cash, and marketable securities | $ 448,542 |
| | |
| Other long-term liabilities | $ 769 |

There were no transfers between Level 1, Level 2 and Level 3 during the periods presented. Our debt securities of U.S. government agencies 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. At March 31, 2023, the remaining contractual maturities of available-for-sale securities ranged from zero to three months. Interest income generated from our investments was $2.0 million and $1.2 million during the three months ended March 31, 2023 and 2022, respectively, which is included in other income, net in the condensed consolidated statements of operations.

The total fair value of investments with unrealized losses at March 31, 2023 was zero. None of the available-for-sale securities held as of March 31, 2023 have been in an unrealized loss position for more than one year. The Company evaluates investments that are in an unrealized loss position for impairment as a result of credit loss. It was determined that no credit losses exist as of March 31, 2023, because the change in market value of those securities has resulted from fluctuations in market interest rates since the time of purchase, rather than a deterioration of the credit worthiness of the issuers. For marketable securities in an unrealized loss position, we assess our intent to sell, or whether it is more likely than not that we will be required to sell the security before recovery of its amortized cost basis. We intend to hold our marketable securities to maturity and it is unlikely that they would be sold before their cost bases are recovered. The cost of securities sold is based on the specific identification method.

The following tables include a rollforward of the stock payable liability, contingent consideration, and Senior Secured 2028 Notes classified within Level 3 of the fair value hierarchy (in thousands):

| | Stock Payable Liability | Contingent Consideration | Convertible Senior Secured Notes |
|---|---|---|---|
| Fair value at December 31, 2022 | $ 744 | $ 25 | $ — |
| Issuance of convertible senior secured notes at fair value | — | — | 301,071 |
| Changes in fair value | (218) | — | (18,304) |
| Changes in fair value related to instrument-specific credit risk | — | — | 171 |
| Settlements | (226) | — | — |
| Fair value at March 31, 2023 | $ 300 | $ 25 | $ 282,938 |

| | Stock Payable Liability | Contingent Consideration |
|---|---|---|
| Fair value at December 31, 2021 | $ 20,925 | $ 1,875 |
| Change in fair value | (10,003) | 154 |
| Fair value at March 31, 2022 | $ 10,922 | $ 2,029 |

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. The change in fair value related to stock payable liabilities was income of $0.2 million and $10.0 million during the three months ended March 31, 2023 and 2022, respectively, which is recorded in change in fair value of acquisition-related liabilities in the condensed consolidated statements of operations.

Contingent consideration relates to the obligation we may be required to pay in the form of additional shares of our common stock resulting from the acquisition of Genelex in April 2020. The amount of the contingent obligation is dependent upon the achievement of a certain product milestone, at which time we would issue shares of our common stock with a value equal to a portion of the gross revenues actually received by us for a pharmacogenetic product reimbursed through certain payers during an earn-out period of up to four years. The estimated fair value of the contingent consideration is based upon significant inputs not observable in the market and, therefore, represents a Level 3 measurement. 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 milestone, the estimated revenues achieved for a pharmacogenetic product and the discount rate used to estimate the fair value. Significant changes in any of the probabilities of success would result in a significant change in the estimated fair value of the liability. The change in fair value related to contingent consideration recorded to other (expense) income, net was zero and expense of $0.2 million during the three months ended March 31, 2023 and 2022, respectively.

In March 2023, the Company issued 4.50% Series A convertible senior secured notes due 2028 (“Series A Notes”) with an aggregate principal amount of $275.3 million, and Series B convertible senior secured notes due 2028 (the "Series B Notes") with an aggregate principal amount of $30.0 million. The Company elected the fair value option to account for the Senior Secured 2028 Notes. We utilize the binomial lattice model, specifically a lattice model to estimate the fair value of the convertible senior secured notes at issuance and subsequent reporting dates. The estimated fair value of the Senior Secured 2028 Notes is determined using Level 3 inputs and assumptions unobservable in the market. This model incorporates the terms and conditions of the Senior Secured 2028 Notes and assumptions related to stock price, expected stock price volatility, risk-free interest rate, market credit spread, and cost of debt. The stock price is based on the publicly traded price of our common stock as of the measurement date. We estimate the volatility of our stock price based on the historical and implied volatilities of our publicly traded common stock. The risk-free interest rate is based on interpolated U.S. Treasury rates, commensurate with a similar term to the Senior Secured 2028 Notes. The most significant assumptions in the binomial lattice model impacting the fair value of the Senior Secured 2028 Notes are (i) the estimated stock price,

(ii) the estimated cost of debt, and (iii) the volatility of our common stock. Significant changes in any of these inputs may result in a significant change in the fair value of the Senior Secured 2028 Notes.

Under the fair value election as prescribed by ASC 825, we will record changes in fair value, inclusive of related accrued interest, through the condensed consolidated statement of operations as a fair value adjustment of the convertible senior secured debt each reporting period, with the portion of the change that results from a change in the instrument-specific credit risk recorded separately in other comprehensive loss, if applicable. The portion of total changes in fair value of debt attributable to changes in instrument-specific credit risk are determined through specific measurement of periodic changes in the risk-free interest rate, credit spread, and cost of debt assumptions. The initial carrying amount of the Senior Secured 2028 Notes, measured at the estimated fair value on the date of issuance, was $301.1 million. As of March 31, 2023, the estimated fair value was $282.9 million. During the three months ended March 31, 2023, the corresponding change in fair value of the Senior Secured 2028 Notes was a gain of $18.3 million, which is included in other (expense) income, net in the condensed consolidated statements of operations. The change in fair value related to instrument-specific credit risk was $0.2 million, which is included in the condensed consolidated statements of comprehensive loss. See Note 7, "Commitments and contingencies" under the heading "Convertible senior notes—Convertible senior secured notes due 2028" for a description of the Senior Secured 2028 Notes.

Significant inputs into the binomial lattice model as of March 31, 2023 and March 7, 2023 were as follows:

| | March 31, 2023 | March 7, 2023 |
|---|---|---|
| Stock price | $1.35 | $1.65 |
| Conversion price | $2.58 | $2.58 |
| Volatility | 110.0 % | 107.5 % |
| Risk-free interest rate | 3.64 % | 4.35 % |
| Credit spread | 13.74 % | 13.76 % |
| Cost of debt | 17.4 % | 18.1 % |
| Term (years) | 4.96 | 5.02 |

**7. Commitments and contingencies**

***Leases***

The Company has entered into various non-cancellable operating lease agreements for office and laboratory space domestically and internationally. The Company's current leases have remaining terms ranging from approximately 1 to 12 years, some of which include options to extend the leases. The renewal options were not included in the calculation of the operating lease assets and the operating lease liabilities as they are not reasonably certain of being exercised. The security deposits for our operating leases are included in restricted cash in our condensed consolidated balance sheets.

In 2015, we entered into a non-cancelable operating lease agreement for our headquarters and main production facility in San Francisco, California, which commenced in 2016 with an initial lease term extending through 2026. In 2020, we entered into a non-cancelable operating lease agreement for additional office and laboratory space in San Francisco, California, which commenced in 2021 and has an initial lease term extending through 2031. In 2021, we entered into a non-cancelable operating lease agreement for a new laboratory and production facilities in Morrisville, North Carolina, which commenced in the same year with an initial lease term extending through 2035. See the discussion below regarding management's decision to exit the operating leases for additional office and laboratory space in San Francisco, California and a portion of the new laboratory and production facilities in Morrisville, North Carolina and the related impairment in the first quarter of 2023.

We have entered into various finance lease agreements to obtain laboratory equipment. The terms of our finance leases are generally three years and are typically secured by the underlying equipment. The portion of the future payments designated as principal repayment and related interest was classified as a finance lease obligation in our condensed consolidated balance sheets. Finance lease assets are recorded within other assets in our condensed consolidated balance sheets.

During the first quarter of 2023, we decided to exit certain leased premises and actively began looking to sublease certain facilities, including the related leasehold improvements. We determined that the changes in the intended use of these locations represented an indicator of impairment and performed a test of recoverability on March 31, 2023. For operating leases where the carrying values of the asset group were lower than the undiscounted cash flows expected through sublease, we impaired the asset group to their fair value. The fair value

was determined by utilizing the discounted cash flow method under the income approach. The key inputs to this valuation were expected sublease rental income ranging from $7.6 million to $35.7 million and a discount rate ranging from 7.0% to 8.0%. This fair value measurement is based on significant inputs not observable in the market and, therefore, represents a Level 3 measurement. During the three months ended March 31, 2023, we recognized an impairment charge of $37.8 million related to the right-of-use assets and $2.0 million for the related leasehold improvements, which are included in restructuring and other costs in our condensed consolidated statement of operations.

During the first quarter of 2023, we reassessed certain leases previously impaired as part of the strategic realignment for additional impairment due to the continued decline in market conditions and changes in the ability to sublease the properties. We determined that the changes in market conditions represented an indicator of impairment and performed a test of recoverability on March 31, 2023. For operating leases where the carrying values of the asset group were lower than the undiscounted cash flows expected through sublease, we further impaired the asset group to their fair value. The fair value was determined by utilizing the discounted cash flow method under the income approach. The key inputs to this valuation were expected sublease rental income ranging from $0.3 million to $1.9 million and discount rates ranging from 7.50% to 7.75%. This fair value measurement is based on significant inputs not observable in the market and, therefore, represents a Level 3 measurement. During the three months ended March 31, 2023, we recognized an impairment charge of $2.3 million related to the right-of-use assets, which is included in restructuring and other costs in our consolidated statements of operations.

Sublease income was $0.4 million during the three months ended March 31, 2023. There was no sublease income for the three months ended March 31, 2022.

***Debt financing***

In October 2020, we entered into a credit agreement with a financial institution under which we borrowed $135.0 million (the "2020 Term Loan") concurrent with the closing of the ArcherDX, Inc. ("ArcherDX") acquisition. The 2020 Term Loan is secured by a first priority lien on all of our and our subsidiaries' assets, and is guaranteed by us and our subsidiaries. The 2020 Term Loan bears interest at an annual rate equal to three-month LIBOR, subject to a 2.00% LIBOR floor, plus a margin of 8.75%. If three-month LIBOR can no longer be determined or if the applicable governmental authority ceases to supervise or sanction such rates, then we will endeavor to agree with the administrative agent, an alternate rate of interest that gives due consideration to the then prevailing market convention for determining interest for comparable loans in the United States, provided that until such alternative rate of interest is agreed, the 2020 Term Loan shall bear interest at the *Wall Street Journal* Prime Rate. The three-month LIBOR is expected to be available and representative through June 30, 2023. The 2020 Term Loan will mature on (i) June 1, 2024, if at such time our 2024 Notes (defined below) are outstanding and are due to mature on September 1, 2024 (provided that if, prior to such date, the maturity date of at least 80% of the 2024 Notes is extended to a date that is prior to September 1, 2025, the maturity date for the 2020 Term Loan will be automatically extended to a date that is 90 days prior to such 2024 Notes maturity date as extended), or (ii) otherwise, on June 1, 2025. The full amount of the 2020 Term Loan is due upon maturity. If the 2020 Term Loan is prepaid (whether such prepayment is optional or mandatory), we must pay a prepayment fee of 6% if the prepayment occurs prior to the third anniversary of the closing date or 4% if the prepayment occurs after the third anniversary of the closing date and we must also pay a make-whole fee if the prepayment occurs prior to the second anniversary of the closing date.

The credit agreement contains customary events of default and covenants, including among others, covenants limiting our ability to incur debt, incur liens, undergo a change in control, merge with or acquire other entities, make investments, pay dividends or other distributions to holders of our equity securities, repurchase stock, and dispose of assets, in each case subject to certain customary exceptions. In addition, the credit agreement contains financial covenants that require us to maintain a minimum cash balance and minimum quarterly revenue levels.

Debt discounts, including debt issuance costs, related to the 2020 Term Loan of $32.8 million were recorded as a direct deduction from the debt liability and are being amortized to interest expense over the term of the 2020 Term Loan. Interest expense related to our debt financings, excluding the impact of our convertible senior notes (defined below), was $4.1 million and $5.9 million for the three months ended March 31, 2023 and 2022, respectively.

In February 2023, we repaid, prior to the maturity date, the principal balance outstanding of $135.0 million plus accrued interest of $2.6 million. During the three months ended March 31, 2023, we incurred debt extinguishment costs of $19.3 million related to the prepayment, which included the write-off of unamortized debt

issuance costs of $11.2 million and prepayment fees of $8.1 million, which are included in loss on extinguishment of debt, net in the condensed consolidated statements of operations.

***Convertible senior notes***

*Convertible senior notes due 2024*

In September 2019, we issued, at par value, $350.0 million aggregate principal amount of 2.00% convertible senior notes due 2024 (the "2024 Notes") in a private offering. The 2024 Notes are our senior unsecured obligations and will mature on September 1, 2024, unless earlier converted, redeemed or repurchased. The 2024 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 2024 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. The initial conversion rate for the 2024 Notes is 33.6293 shares of our common stock per $1,000 principal amount of the 2024 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 2024 Notes), the holders of the 2024 Notes may require us to repurchase all or any portion of their 2024 Notes for cash at a repurchase price equal to 100% of the principal amount of the 2024 Notes to be repurchased plus accrued and unpaid interest to, but excluding, the redemption date.

The 2024 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 2024 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 2024 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 2024 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 2024 Notes at any time, regardless of the foregoing circumstances. Since issuance, these notes were convertible at the option of the holders during the quarters beginning on January 1, 2021 and April 1, 2021 due to the sale price of our common stock during the quarters ended December 31, 2020 and March 31, 2021, respectively. The notes were not convertible during the three months ended March 31, 2023 and there have been no significant conversions in the periods in which they were convertible.

We may redeem for cash all or any portion of the 2024 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.

See the discussion below regarding the purchase and exchange agreements with certain holders of the outstanding 2024 Notes. As of March 31, 2023, the outstanding principal balance of the 2024 Note was $44.3 million.

*Convertible senior notes due 2028*

In April 2021, we issued, at 99% of par value, $1,150.0 million aggregate principal amount of 1.5% convertible senior notes due 2028 (the "2028 Notes") in a private offering. The 2028 Notes are our senior unsecured obligations and will mature on April 1, 2028, unless earlier converted, redeemed or repurchased. The 2028 Notes bear cash interest at a rate of 1.5% per year, payable semi-annually in arrears on April 1 and October 1 of each year, beginning on October 1, 2021. Upon conversion, the 2028 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.

The 2028 Notes will be convertible at the option of the holder at any time until the second scheduled trading day prior to the maturity date, including in connection with a redemption by us. The 2028 Notes will be convertible into shares of our common stock based on an initial conversion rate of 23.1589 shares of common stock per $1,000 principal amount of the 2028 Notes (which is equal to an initial conversion price of $43.18 per share), in each case subject to customary anti-dilution and other adjustments as a result of certain extraordinary transactions. None of the 2028 Notes have been converted to date.

We may not redeem the 2028 Notes prior to April 6, 2025. On or after April 6, 2025, the 2028 Notes will be redeemable by us in the event that the closing sale price of our common stock has been at least 150% 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 the redemption notice at a redemption price of 100% of the principal amount of such 2028 Notes, plus accrued and unpaid interest to, but excluding, the redemption date.

With certain exceptions, upon a change of control of the Company or the failure of our common stock to be listed on certain stock exchanges, the holders of the 2028 Notes may require that we repurchase all or part of the principal amount of the Notes at a repurchase price of 100% of the principal amount of the 2028 Notes to be repurchased, plus unpaid interest to, but excluding, the maturity date.

*Summary of convertible senior notes*

Our 2024 Notes and 2028 Notes (collectively, our "Convertible Senior Notes") consisted of the following (in thousands):

| | March 31, 2023 | December 31, 2022 |
|---|---|---|
| Outstanding principal | $ 1,194,269 | $ 1,499,996 |
| Unamortized debt discount and issuance costs | (24,895) | (29,213) |
| Net carrying amount | $ 1,169,374 | $ 1,470,783 |

As of March 31, 2023, the fair value of the 2024 Notes and 2028 Notes was $38.9 million and $492.4 million, respectively. The estimated fair value of the 2024 Notes and 2028 Notes, which use Level 2 fair value inputs, was determined based on the estimated or actual bid prices in an over-the-counter market and/or market conditions including the price and volatility of our common stock and comparable company information. We recognized $7.2 million and $7.7 million of interest expense related to our Convertible Senior Notes during the three months ended March 31, 2023 and 2022, respectively. Of the interest expense recognized, $1.5 million and $1.6 million during the three months ended March 31, 2023 and 2022, respectively, was related to amortization of issuance costs and the remainder was related to contractual interest incurred.

*Convertible senior secured notes due 2028*

In February 2023, we entered into purchase and exchange agreements with certain holders of the outstanding 2024 Notes. Under the terms of the agreements, we (a) exchanged $305.7 million aggregate principal amount of 2024 Notes for $275.3 million aggregate principal amount of Series A Notes and 14,219,859 shares of the Company’s common stock and (b) issued and sold $30.0 million aggregate principal amount of Series B Notes for cash.

The Senior Secured 2028 Notes are our senior secured obligations and will mature on March 15, 2028, unless earlier converted, redeemed or repurchased. The Senior Secured 2028 Notes bear cash interest at a rate of 4.50% per year, payable quarterly in arrears on March 15, June 15, September 15 and December 15 of each year, beginning on June 15, 2023.

Based on the initial conversion price of $2.58, the Senior Secured 2028 Notes will be initially convertible into an aggregate of 118,316,667 shares of common stock, and after taking into account the maximum number of additional shares issuable in certain circumstances as described in the indenture, an aggregate of 141,979,975 shares of common stock.

At any time prior to the 60th day prior to the maturity date of the Senior Secured 2028 Notes, we have the option to redeem all or any portion of the principal amount of the Senior Secured 2028 Notes for cash equal to the principal amount of the Senior Secured 2028 Notes to be redeemed. Upon redemption of any Senior Secured 2028 Notes, we will (i) issue warrants to purchase shares of common stock, unless the aggregate principal amount of Senior Secured 2028 Notes outstanding represents less than 10% of the aggregate principal amount of Senior Secured 2028 Notes initially issued and certain other conditions are satisfied, and (ii) make a make-whole payment

as determined pursuant to the indenture governing the Senior Secured 2028 Notes, together with accrued and unpaid interest through the redemption date. In addition, in certain circumstances, we may be required to issue additional shares of common stock for any Senior Secured 2028 Notes converted in connection with a notice of optional redemption. The indenture governing the Senior Secured 2028 Notes also provides for the issuance of warrants to purchase shares of common stock in connection with the prepayment of the Senior Secured 2028 Notes upon acceleration of the Senior Secured 2028 Notes following the occurrence of an event of default under the indenture as a result of the failure by the Company to settle any conversion. Any warrants issued will cover the same number of shares of the common stock underlying and at an exercise price equal to the conversion price of the redeemed or prepaid Senior Secured 2028 Notes. The number of shares issuable upon conversion or exercise is subject to customary anti-dilution and other adjustments (as defined in the indenture governing the Senior Secured 2028 Notes).

The Senior Secured 2028 Notes will be convertible at any time prior to the maturity date at the option of the holders, subject to a beneficial ownership cap. In addition, prior to such time that the Company obtains stockholder approval for the issuance of shares of common stock in excess of the limitations imposed by the NYSE rules (the “NYSE Cap”), holders of the Series A Notes are prohibited from converting their notes or exercising any warrants issued in respect of the Series A Notes into shares of common stock in excess of such NYSE Cap and we would instead be required to settle any conversion in cash if we are not able to obtain the stockholder approval prior to September 30, 2023 (the grace period specified in the indenture). The cash settlement amount upon conversion of a Series A Note by a holder prior to stockholder approval is equal to the product of the shares of common stock in excess of the NYSE Cap multiplied by the arithmetic average of the volume weighted average price of our common stock on each of the five consecutive trading days immediately preceding the conversion date. After obtaining stockholder approval, the full amount of the outstanding balance of the Senior Secured 2028 Notes will be convertible into shares of common stock, with no conversion limitations. There can be no assurance that we will be successful in obtaining stockholder approval for the proposal to approve the issuance of shares of common stock pursuant to the conversion of the Senior Secured 2028 Notes or the exercise of any warrants issued in respect to the Senior Secured 2028 Notes in excess of the limitations imposed by the NYSE Cap prior to September 30, 2023. If we fail to obtain stockholder approval, we may not have enough available cash or be able to obtain financing at the time we are required to settle any conversion.

If we undergo a major transaction (as defined in the indenture), holders may require us to repurchase for cash all or part of their Senior Secured 2028 Notes at a purchase price equal to 100% of the principal amount of the Senior Secured 2028 Notes to be repurchased, plus (i) accrued and unpaid interest to, but excluding, the repurchase date and (ii) the make-whole amount as determined pursuant to the indenture governing the Senior Secured 2028 Notes. In addition, at the election of the holders of the Senior Secured 2028 Notes, we may be required to issue additional shares of common stock for any Senior Secured 2028 Notes converted in connection with a major transaction.

The Senior Secured 2028 Notes are guaranteed by our material subsidiaries and secured by (i) a security interest in substantially all of the assets of the Company and its domestic material subsidiaries and (ii) a pledge of the equity interests of the Company's direct and indirect subsidiaries, subject to certain customary exceptions. The indenture contains certain specified events of default, the occurrence of which would entitle the holders of the Senior Secured 2028 Notes to demand repayment of all outstanding principal and accrued interest on the Notes, together with a make-whole payment as determined pursuant to the indenture. The indenture also includes specific affirmative and restrictive covenants agreed to by the Company. In addition, the indenture also contains financial covenants that will require us to maintain revenue in the prior four quarters of not less than $250.0 million and, starting with the quarter ending March 31, 2025, a minimum liquidity of at least 15% of the amount of our secured indebtedness then outstanding. As of March 31, 2023, we are in compliance with all restrictive and financial covenants.

We elected the fair value option to account for the Senior Secured 2028 Notes, which requires the notes to be accounted for as a single liability initially measured at its issue-date estimated fair value and then subsequently remeasured at estimated fair value on a recurring basis as of each reporting date. We have elected not to present the interest expenses separate from the fair value changes of the Senior Secured 2028 Notes. Considering the terms of settlement noted above, we elected the fair value option for the Senior Secured 2028 Notes as we believe it best reflects the underlying economics and also for simplification and cost-benefit considerations of accounting such Senior Secured 2028 Notes at fair value versus bifurcation of the embedded derivatives.

The initial carrying amount of the Senior Secured 2028 Notes, measured at the estimated fair value on the date of issuance, was $301.1 million. As of March 31, 2023, the estimated fair value of the Senior Secured 2028 Notes was $282.9 million. The portion of the estimated fair value of Series A Notes for which conversion is subject

to stockholder approval and for which the Company has a cash settlement obligation is classified as a current liability with the remainder classified as a long-term liability in the condensed consolidated balance sheets. The current liability was determined based on the product of the shares of common stock in excess of the NYSE Cap multiplied by the arithmetic average of the volume weighted average price of our common stock on each of the five consecutive trading dates immediately preceding March 31, 2023. The long-term liability represents the portion of the Senior Secured 2028 Notes for which we have the intent and the ability to settle the obligations by issuing shares. During the three months ended March 31, 2023, the corresponding change in fair value of the Senior Secured 2028 Notes was a gain of $18.3 million, which is included in other (expense) income, net in the condensed consolidated statements of operations. During the three months ended March 31, 2023, the change in fair value related to instrument-specific credit risk was $0.2 million, which is included in the condensed consolidated statements of comprehensive loss.

In connection with the issuance of the Senior Secured 2028 Notes, we incurred approximately $19.9 million of debt issuance costs primarily related to legal and consulting fees paid to third parties, which were expensed as incurred during the three months ended March 31, 2023 and included in other (expense) income, net in the condensed consolidated statements of operations.

The exchange of the 2024 Notes for the Senior Secured 2028 Notes was treated as an extinguishment of debt, and we recognized a gain on extinguishment of $8.5 million representing the difference between the fair value of the Series A Notes immediately prior to the exchange plus the fair value of common shares issued and the carrying amount of the 2024 Notes, which is included in loss on extinguishment of debt, net in the condensed consolidated statements of operations.

***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, 2023, our total future payments under noncancelable unconditional purchase commitments having a remaining term of over one year were $35.6 million.

***Guarantees and indemnification***

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, 2023 or December 31, 2022.

***Contingencies***

We are and may from time to time be involved in various legal proceedings and claims arising in the ordinary course of business. Legal proceedings, including litigation, government investigations and enforcement actions could result in material costs, occupy significant management resources and entail civil and criminal penalties, even if we ultimately prevail. If an investigation results in a proceeding against us, an adverse outcome could include us being required to pay treble damages, and incur attorneys' fees, civil or criminal penalties and other adverse actions that could materially and adversely affect our business, financial condition and results of operations. 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.

We were not a party to any material legal proceedings at March 31, 2023, or at the date of this report except for matters listed below. We cannot currently predict the outcome of these actions.

*Natera, Inc.*

On January 27, 2020, Natera filed a lawsuit against ArcherDX (a subsidiary of Invitae effective October 2, 2020) in the United States District Court for the District of Delaware, alleging that ArcherDX's products using Anchored Multiplex PCR ("AMP") chemistry, and the manufacture, use, sale, and offer for sale of such products, infringe U.S. Patent No. 10,538,814. On March 25, 2020, ArcherDX filed an answer denying Natera's allegations and asserting certain affirmative defenses and counterclaims, including that U.S. Patent No. 10,538,814 is invalid and not infringed. On April 15, 2020, Natera filed an answer denying ArcherDX's counterclaims and filed an amended complaint alleging that ArcherDX's products using AMP chemistry, including STRATAFIDE, PCM,

LiquidPlex, ArcherMET, FusionPlex, and VariantPlex, and the manufacture, use, sale, and offer for sale of such products, infringe U.S. Patent No. 10,538,814, U.S. Patent No. 10,557,172, U.S. Patent No. 10,590,482, and U.S. Patent No. 10,597,708, each of which are held by Natera. Natera seeks, among other things, damages and other monetary relief, costs and attorneys' fees, and an order enjoining ArcherDX from further infringement of such patents. On May 13, 2020, ArcherDX filed an answer to Natera's amended complaint denying Natera's allegations and asserting certain affirmative defenses and counterclaims, including that the asserted patents are invalid and not infringed. On June 3, 2020, Natera filed an answer denying ArcherDX's counterclaims. On June 4, 2020, ArcherDX filed a motion seeking dismissal of Natera's infringement claims against STRATAFIDE, PCM, and ArcherMET, and for a judgment that U.S. Patent No. 10,538,814, U.S. Patent No. 10,557,172, and U.S. Patent No. 10,590,482 are invalid. On August 6, 2020, Natera filed another complaint against ArcherDX in the United States District Court for the District of Delaware alleging that ArcherDX's products using AMP chemistry, including STRATAFIDE, PCM, LiquidPlex, ArcherMET, and VariantPlex, and the manufacture, use, sale, and offer for sale of such products, infringe U.S. Patent No. 10,731,220. Natera seeks, among other things, damages and other monetary relief, costs and attorneys' fees, and an order enjoining ArcherDX from further infringement of the patent. On October 13, 2020, the court issued an order denying ArcherDX's motion for dismissal of Natera's infringement claims against STRATAFIDE, PCM, and ArcherMET, and declined to enter judgment that U.S. Patent No. 10,538,814, U.S. Patent No. 10,557,172, and U.S. Patent No. 10,590,482 are invalid. On January 12, 2021, the court issued an order granting Natera leave to amend its complaint to add Invitae as a co-defendant and plead allegations that ArcherDX and Invitae induce end-users to infringe the patents-in-suit. Natera filed its second amended complaint ("Second Amended Complaint") on the same day, with service completed on January 15, 2021. ArcherDX and Invitae filed answers to the Second Amended Complaint on January 26, 2021 and February 5, 2021, respectively, denying Natera's allegations and restating certain affirmative defenses and counterclaims of non-infringement and invalidity. The litigations have now been consolidated for all purposes. A claim construction order was issued on June 28, 2021. On October 27, 2021, Natera filed its third amended complaint ("Third Amended Complaint") to add a Certificate of Correction to U.S. Patent No. 10,590,482. On November 3, 2021, ArcherDX filed its answer and counterclaims to Natera's Third Amended Complaint, adding an inequitable conduct defense and declaratory judgment counterclaims. Discovery concluded in December 2021. On January 21, 2022, Natera, ArcherDX and Invitae moved for summary judgment, wherein Natera seeks a determination on certain legal and equitable defenses and ArcherDX and Invitae seek a determination of non-infringement and invalidity of the asserted patents. Those motions were denied by order dated February 6, 2023, and trial began on May 8, 2023.

In addition, on October 6, 2020, Natera filed a complaint against Genosity in the United States District Court for the District of Delaware, alleging that Genosity's use of its AsTra products, and the manufacture, use, sale, and offer for sale of such products, infringes U.S. Patent No. 10,731,220. Natera's complaint further alleges that Genosity's accused products use ArcherDX's ctDNA and region-specific primers. Genosity filed an answer to the complaint on February 15, 2021, denying Natera's allegations and setting forth affirmative defenses and counterclaims of non-infringement, invalidity and unenforceability due to inequitable conduct. On March 8, 2021, Natera filed a motion to dismiss and strike certain affirmative defenses and counterclaims brought by Genosity relating to inequitable conduct. The court denied that motion on March 14, 2022. The court granted an order granting the parties' stipulated request to stay the case on April 1, 2022.

*QIAGEN Sciences*

On July 10, 2018, ArcherDX and the General Hospital Corporation d/b/a Massachusetts General Hospital, which we refer to as MGH, filed a lawsuit in the United States District Court for the District of Delaware against QIAGEN Sciences, LLC, QIAGEN LLC, QIAGEN Beverly, Inc., QIAGEN Gaithersburg, Inc., QIAGEN GmbH and QIAGEN N.V., which is collectively referred to herein as QIAGEN, and a named QIAGEN executive who was a former member of ArcherDX's board of directors, alleging several causes of action, including infringement of the '810 Patent, trade secret misappropriation, breach of fiduciary duty, false advertising, tortious interference and deceptive trade practices. The '810 Patent relates to methods for preparing a nucleic acid for sequencing and aspects of ArcherDX's AMP technology. On October 30, 2019, with the permission of the Court, ArcherDX amended ArcherDX's complaint to add a claim for infringement of the '597 Patent. The '597 Patent relates to methods of preparing and analyzing nucleic acids, such as by enriching target sequences prior to sequencing, and aspects of ArcherDX's AMP technology. The QIAGEN products that ArcherDX alleges infringe the '810 Patent and the '597 Patent include, but are not limited to, QIAseq Targeted DNA Panels, QIAseq Targeted RNAscan Panels, QIAseq Index Kits and QIAseq Immune Repertoire RNA Library Kits. ArcherDX is seeking, among other things, damages for ArcherDX's lost profits due to QIAGEN's infringement and a permanent injunction enjoining QIAGEN from marketing and selling the infringing products and from using ArcherDX's trade secrets. On December 5, 2019, QIAGEN and the named QIAGEN executive submitted their answer denying the allegations in ArcherDX's complaint and asserting affirmative defenses that, among other things, the '810 Patent and '597 Patent are not infringed by

QIAGEN's products, that both patents are invalid, and that the complaint fails to state any claim for which relief may be granted. On March 1, 2021, each of ArcherDX and QIAGEN moved for summary judgment on issues relating to infringement and validity of ArcherDX's patents, breach of fiduciary duty and trade secret misappropriation. On June 18, 2021, ArcherDX informed the court that it would not assert the following claims to streamline the issues for trial: trade secret misappropriation, false advertising, deceptive trade practices, and tortious interference. The court denied QIAGEN's motion for summary judgment on trade secret misappropriation as moot on June 21, 2021, denied QIAGEN's motion for summary judgment on breach of fiduciary duty on July 26, 2021, and granted QIAGEN's motion for summary judgment of no literal infringement of the '810 Patent on August 21, 2021. Trial proceeded on August 23 through August 27, 2021, resulting in a unanimous jury verdict, which found that: (i) all asserted claims of the '810 and '597 Patents are valid, (ii) QIAGEN willfully infringed the asserted claims of the '810 patent (under the doctrine of equivalents) and the '597 patent (literal infringement), and (iii) ArcherDX and MGH are entitled to recover approximately $4.7 million in damages. On September 30, 2022, the court issued an order denying QIAGEN's post-trial motion for a new trial or altered verdict, granting ArcherDX's post-trial motion for ongoing royalty at a rate of 7% along with supplemental damages and interest, and denying ArcherDX's motion for an injunction with leave to renew after an evidentiary hearing. No date has been set for the hearing on ArcherDX's request for an injunction.

**8. Stockholders' equity**

***Shares outstanding***

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

| | Three Months Ended March 31, | |
|---|---|---|
| | 2023 | 2022 |
| Common stock: | | |
| Shares outstanding, beginning of period | 245,562 | 228,116 |
| Common stock issued in connection with the convertible senior notes exchange | 14,220 | — |
| Common stock issued on exercise of stock options, net | 1 | 87 |
| Common stock issued pursuant to vesting of RSUs | 715 | 621 |
| Common stock issued pursuant to acquisitions | 177 | — |
| Shares outstanding, end of period | 260,675 | 228,824 |

***Common Stock***

As of March 31, 2023 and December 31 2022, we had 600 million shares of common stock authorized with a par value of $0.0001.

***Convertible preferred stock***

In August 2017, in a private placement to certain accredited investors, we issued shares of our Series A convertible preferred stock which are convertible into common stock on a one-for-one basis, subject to adjustment for events such as stock splits, combinations and the like. The Series A convertible preferred stock is a non-voting common stock equivalent with a par value of $0.0001 and has the right to receive dividends first or simultaneously with payment of dividends on common stock. In the event of any liquidation or dissolution of the Company, the Series A preferred stock is entitled to receive $0.001 per share prior to the payment of any amount to any holders of capital stock ranking junior to the Series A preferred stock and thereafter shall participate pari passu with the holders of our common stock (on an as-if-converted-to-common-stock basis). As of March 31, 2023 and December 31, 2022, we had 20 million shares of preferred stock authorized, of which 3,458,823 shares were designated as Series A convertible preferred stock. As of March 31, 2023 and December 31, 2022, there were no shares of preferred stock or Series A convertible preferred stock outstanding.

***Sales Agreement***

In May 2021, we entered into a sales agreement (the "2021 Sales Agreement") with Cowen and Company, LLC ("Cowen") under which we may offer and sell from time to time at our sole discretion shares of our common stock through Cowen as our sales agent, in an aggregate amount not to exceed $400.0 million. Per the terms of the agreement, Cowen will receive a commission of up to 3% of the gross proceeds of the sales price of all shares sold through it as sales agent under the 2021 Sales Agreement.

During the three months ended March 31, 2023 and 2022, we did not sell any common stock under the 2021 Sales Agreement.

***Senior Secured 2028 Notes***

In connection with the issuance of the Senior Secured 2028 Notes on March 7, 2023, we and Deerfield Partners, L.P. (the "selling stockholder"), also entered into a registration rights agreement ("Registration Rights Agreement"). Pursuant to the Registration Rights Agreement, on March 17, 2023, we filed a registration statement to register 111,627,888 shares of common stock issuable upon conversion of the Series B Notes or exercise of the warrants ("Registrable Securities") issuable in connection with certain prepayments of the Series B Notes or Series A Notes, which registration statement was declared effective on April 21, 2023. The selling stockholder may from time to time offer and sell any or all of such issued shares of common stock. We will not receive any proceeds from the sale of shares of our common stock by the selling stockholder. We will receive the proceeds from any exercise of the warrants on a cash basis.

Additionally, under the terms of the purchase and exchange agreements, we exchanged $305.7 million aggregate principal amount of 2024 Notes for $275.3 million aggregate principal amount of Series A Notes and 14,219,859 shares of the Company's common stock, and we issued and sold $30.0 million aggregate principal amount of Series B Notes for cash. See Note 7, "Commitments and contingencies" under the heading "Convertible senior notes—Convertible senior secured notes due 2028" for additional information.

**9. 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 value 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. 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.

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. Upon the acquisition of ArcherDX in October 2020, any option that was outstanding was converted into a fully vested option to purchase a share of our common stock, which resulted in the issuance of options to purchase 3.7 million shares of our common stock.

Restricted stock units ("RSUs") generally vest ratably in annual installments over a period of three years, commencing on the first anniversary of the grant date, with certain awards that include a portion that vests immediately upon grant. The vesting schedule for the 2022 grants approved in April 2022 provides that the awards vest ratably in quarterly installments over a period of two years, with certain awards that include a portion that vests immediately upon grant. Grants to the executive team in 2022 vest ratably in annual installments over a period of three years. We have also granted certain awards in connection with our management incentive plan that vest over a period of two years.

In April 2021, we granted RSUs in connection with the acquisition of Genosity Inc. ("Genosity") having a value of up to $5.0 million to certain continuing employees. During both the three months ended March 31, 2023 and 2022, we recognized $0.4 million in stock-based compensation expense primarily reported in research and development expense in our condensed consolidated statements of operations. In September 2021, we granted RSUs in connection with the acquisition of the Ciitizen Corporation having a value of up to $246.9 million to certain

continuing employees. During the three months ended March 31, 2023 and 2022, we recognized stock-based compensation expense of $14.7 million and $24.9 million, respectively, primarily reported in research and development expense in our condensed consolidated statements of operations.

Activity under the 2010 Plan and the 2015 Plan is set forth below (in thousands, except per share data 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, 2022 | 12,625 | 2,541 | $ 8.49 | 6.6 | $ 16 |
| Additional shares reserved | 9,822 | — | | | |
| Options granted | (29) | 29 | 2.46 | | |
| Options cancelled | 257 | (257) | 8.20 | | |
| Options exercised | — | (1) | 0.86 | | |
| RSUs and PRSUs granted | (197) | — | | | |
| RSUs and PRSUs cancelled | 425 | — | | | |
| Balances at March 31, 2023 | 22,903 | 2,312 | $ 8.45 | 6.7 | $ 4 |
| Options exercisable at March 31, 2023 | | 1,163 | $ 11.94 | 4.2 | $ 4 |
| Options vested and expected to vest at March 31, 2023 | | 2,118 | $ 8.94 | 6.4 | $ 4 |

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 following table summarizes RSU, including PRSU, activity (in thousands, except per share data):

| | Number of Shares | Weighted- Average Grant Date Fair Value Per Share |
|---|---|---|
| Balance at December 31, 2022 | 11,895 | $ 11.70 |
| RSUs granted | 197 | $ 2.27 |
| RSUs vested | (715) | $ 10.47 |
| RSUs cancelled | (425) | $ 13.54 |
| Balance at March 31, 2023 | 10,952 | $ 11.54 |

***Stock-based compensation***

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

| | Three Months Ended March 31, | |
|---|---|---|
| | 2023 | 2022 |
| Cost of revenue | $ 948 | $ 1,865 |
| Research and development | 18,846 | 31,994 |
| Selling and marketing | 2,599 | 2,909 |
| General and administrative | 6,589 | 10,054 |
| Restructuring and other costs | 211 | — |
| Total stock-based compensation expense | $ 29,193 | $ 46,822 |

Stock-based compensation expense included in restructuring expense was related to the accelerated vesting of RSUs held by certain employees whose employment was terminated as part of the strategic realignment.

**10. Restructuring and other costs**

In July 2022, we initiated a strategic realignment of our operations to reduce operating costs and drive future growth aligned with our core genetic testing and data platform and patient network. The strategic realignment includes a reduction in workforce, lab and office space consolidation, portfolio optimization, decrease in other operating expenses, as well as a reduced international footprint. Under this strategic realignment, we reduced our workforce by approximately 1,000 employees with a majority of these employees separating from the Company by September 30, 2022 and the remaining affected employees transitioning over varying periods of time up to 12

months. Employees who were impacted by the restructuring were eligible to receive severance benefits contingent upon an impacted employee's execution (and non-revocation, where applicable) of a separation agreement, which included a general release of claims against us.

The following table summarizes the expenses related to our strategic realignment recognized in restructuring and other costs in our condensed consolidated statement of operations (in thousands):

| | Three Months Ended March 31, 2023 |
|---|---|
| Employee severance and benefits | $ 1,283 |
| Impairments and losses on disposals of long-lived assets, net | 50,354 |
| Other restructuring costs | 919 |
| Total restructuring and other costs | $ 52,556 |

Employee severance and benefits are comprised of severance, other termination benefit costs, and stock-based compensation expense for the acceleration of RSUs related to workforce reductions. See Note 9, "Stock incentive plans" for additional information about the accelerated vesting of RSUs. Asset impairments and losses on asset disposals, net include operating lease impairments, losses on disposals of leasehold improvements associated with the exit of certain lab and office space and the related equipment. See Note 7, "Commitments and contingencies" under the heading "Leases" for additional information about operating lease impairments. See Note 5, "Balance sheet components" for additional information about net losses on disposal of property and equipment. Other restructuring costs include professional fees in relation to restructuring activities and contract exit costs including our decision to cease development of acquired technology. See Note 4, "Intangible assets" for additional information. There were no restructuring and other costs for the three months ended March 31, 2022.

We expect to incur additional employee severance and benefits expenses up to $0.6 million, and additional other restructuring costs primarily related to third-party costs up to $5.5 million. This reflects the best estimate of the Company as of the date hereof, which may be revised in subsequent periods as the strategic realignment plan progresses.

The following table summarizes the changes in liabilities associated with our strategic realignment initiatives, including restructuring and other costs incurred and cash payments as of March 31, 2023 (in thousands):

| | Employee severance and benefits | Other restructuring costs | Total |
|---|---|---|---|
| Beginning balance | $ — | $ — | $ — |
| Accruals | 35,237 | 7,405 | 42,642 |
| Payments | (32,974) | (5,464) | (38,438) |
| Balance at December 31, 2022 | 2,263 | 1,941 | 4,204 |
| Accruals | 1,072 | 994 | 2,066 |
| Payments | (2,486) | (1,223) | (3,709) |
| Balance at March 31, 2023 | $ 849 | $ 1,712 | $ 2,561 |

The restructuring liabilities are included in accrued liabilities in the condensed consolidated balance sheets. We expect that substantially all of the remaining accrued restructuring liabilities will be paid in cash in 2023. The charges recognized in the roll forward of our accrued restructuring liabilities do not include items charged directly to expense for asset impairments and losses on disposals of long-lived assets, accelerated vesting of RSUs, and other periodic exit costs, as those items are not reflected in our restructuring liabilities in our condensed consolidated balance sheets.

**11. Income taxes**

During the three months ended March 31, 2023 and 2022, we recorded an income tax benefit of $1.0 million and $34.9 million, respectively. The income tax benefit for the three months ended March 31, 2023 is primarily related to a $0.9 million release of federal valuation allowances as a result of impact on our deferred taxes related to Internal Revenue Code Section 174 research and experimental expense capitalization and right-of-use and fixed assets impairment, which enabled the associated deferred tax liability to serve as a source of income to support the realization of existing deferred tax assets for which a valuation allowance had previously been established.

As of March 31, 2023, we maintained $59.3 million of unrecognized tax benefits, of which $0.2 million, if recognized, would affect the Company's effective tax rate. The remainder has been recorded as a reduction to the Company's deferred tax assets and, if recognized, would not have an impact on the effective tax rate due to existing valuation allowance against such deferred tax assets. It is possible that the Company's unrecognized tax benefits could change within the next twelve months due to activities of tax authorities, including possible settlement of audits, should any arise, or through normal expiration of statutes of limitations.

The Company's policy is to include penalties and interest expense related to income taxes as a component of tax expense. As of March 31, 2023, there were no accrued interest and penalties related to the unrecognized tax benefits.

Effective for tax years beginning on or after January 1, 2022, pursuant to the Tax Cuts and Jobs Act of 2017, companies are required to capitalize and amortize Internal Revenue Code Section 174 research and experimental expenses paid or incurred over five years for research and development performed in the United States and 15 years for research and development performed outside of the United States. As a result of the Internal Revenue Code Section 174 research and experimental expense capitalization, the Company recognized a deferred tax asset for the future tax benefit of the amortization deductions with offsetting increase in the valuation allowance on deferred tax assets.

The Inflation Reduction Act of 2022 ("IRA") was signed into law on August 16, 2022. The bill was meant to address the high inflation rate in the U.S. through various climate, energy, healthcare and other incentives. These incentives are meant to be paid for by the tax provisions included in the IRA, such as a new 15 percent corporate minimum tax, a 1 percent new excise tax on stock buybacks, additional IRS funding to improve taxpayer compliance and others. At this time, none of the IRA tax provisions are expected to have a material impact to the Company's tax provision. The Company will continue to monitor for updates to the Company's business along with guidance issued with respect to the IRA to determine whether any adjustments are needed to the Company's tax provision in future periods.

**12. Net loss per share**

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

| | Three Months Ended March 31, | |
|---|---|---|
| | 2023 | 2022 |
| Net loss | $ (192,183) | $ (181,859) |
| Shares used in computing net loss per share, basic and diluted | 249,907 | 228,470 |
| Net loss per share, basic and diluted | $ (0.77) | $ (0.80) |

Common stock issuable in connection with our Convertible Senior Notes and the Senior Secured 2028 Notes participate in any dividends that may be declared by the Company and are therefore considered to be participating securities. The net losses were attributable entirely to common stockholders since the participating securities did not have a contractual obligation to share in the Company's losses.

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, | |
|---|---|---|
| | 2023 | 2022 |
| Shares of common stock subject to outstanding options | 2,366 | 2,972 |
| Shares of common stock subject to outstanding RSUs and PRSUs | 11,399 | 15,935 |
| Shares of common stock pursuant to ESPP | 3,528 | 1,428 |
| Shares of common stock subject to convertible senior notes conversion | 28,122 | 38,403 |
| Shares of common stock subject to convertible senior secured notes conversion | 32,866 | — |
| Total shares of common stock equivalents | 78,281 | 58,738 |

**13. Geographic information**

Revenue by country is determined based on the billing address of the customer and is summarized as follows (in thousands):

| | Three Months Ended March 31, | |
|---|---|---|
| | 2023 | 2022 |
| United States | $ 110,464 | $ 108,295 |
| Canada | 2,101 | 2,297 |
| United Kingdom | 1,186 | 2,147 |
| Rest of world | 3,605 | 10,952 |
| Total revenue | $ 117,356 | $ 123,691 |

**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 and other financial information included in Part I, Item 1. of this Form 10-Q, and together with our audited consolidated financial statements and the related notes and other information included in our Annual Report on Form 10-K for the year ended December 31, 2022. 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 the COVID-19 pandemic on our business and the actions we have taken or may take in response thereto;
- our mission and strategy for our business, products and technology;
- the implementation of our business model and the success of our strategic realignment efforts;
- the expected costs and benefits of our strategic realignment, including anticipated annualized cash savings, and our ability to achieve positive operating cash flow;
- the expected benefits from and our ability to integrate our acquisitions;
- our ability to obtain regulatory approvals for our tests;
- 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;
- our expectations regarding our platform and future offerings;
- 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;
- our ability to obtain and maintain adequate reimbursement for our tests;
- regulatory, political and other developments in the United States and foreign countries;
- our ability to attract and retain key scientific, sales, engineering or management personnel;
- our expectations regarding our ability to obtain and maintain intellectual property protection and not infringe on the rights of others;
- the effects of litigation or investigations on our business;
- our ability to obtain funding for our operations and to service and repay our debt;
- our future financial performance;
- our beliefs regarding our future growth and the drivers of such growth;
- our expectations regarding environmental, social and governance matters;
- 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;
- the impact of macroeconomic conditions, including inflation and recession, on our business; 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 Part II, Item 1A. "Risk Factors" in this Quarterly Report on Form 10-Q. 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. 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.

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.

**Summary of risk factors**

Our business is subject to numerous risks and uncertainties that could affect our ability to successfully implement our business strategy and affect our financial results. You should carefully consider all of the information in this Quarterly Report and, in particular, the following principal risks and all of the other specific factors described in Part II, Item 1A. "Risk Factors" in this Quarterly Report on Form 10-Q before deciding whether to invest in our company.

- We expect to continue incurring significant losses, and we may not successfully execute our plan to achieve or sustain profitability.
- 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.
- Our strategic realignment and the associated headcount reduction have and are expected to significantly change our business, result in significant expense, may not result in anticipated savings, and will disrupt 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.
- 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.
- We need to scale our infrastructure in advance of demand for our tests and other services, and our failure to generate sufficient demand for our tests and other services would have a negative impact on our business and our ability to attain profitability.
- The global macroeconomic environment could negatively impact our business, our financial position and our results of operations.
- We face risks related to health epidemics, including the ongoing COVID-19 pandemic, which could have a material adverse effect on our business and results of operations.
- We face intense competition, which is likely to intensify further as existing competitors devote additional resources to, and new participants enter, the markets in which we operate. If we cannot compete successfully, we may be unable to increase our revenue or achieve and sustain profitability.
- The market for patient data software is competitive, and our business will be adversely affected if we are unable to successfully compete.
- Security breaches, privacy issues, loss of data and other incidents could compromise sensitive or personal 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.
- If we are not able to continue to generate substantial demand for our tests, our commercial success will be negatively affected.
- 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.
- Impairment in the value of our intangible assets has and may in the future have a material adverse effect on our operating results and financial condition.
- We have a large amount of debt, servicing our debt requires a significant amount of cash, we may not have sufficient cash flow from our business to service our debt, and we may need to refinance all or a significant portion of our debt.

- If the FDA regulates the tests we currently offer as LDTs as medical devices, we could incur substantial costs and our business, financial condition and results of operations could be adversely affected.
- One of our competitors has alleged that our Anchored Multiplex PCR, or AMP, chemistry and products using AMP are infringing on its intellectual property, and we may be required to redesign the technology, obtain a license, cease using the AMP chemistry altogether and/or pay significant damages, among other consequences, any of which would have a material adverse effect on our business as well as our financial condition and results of operations.

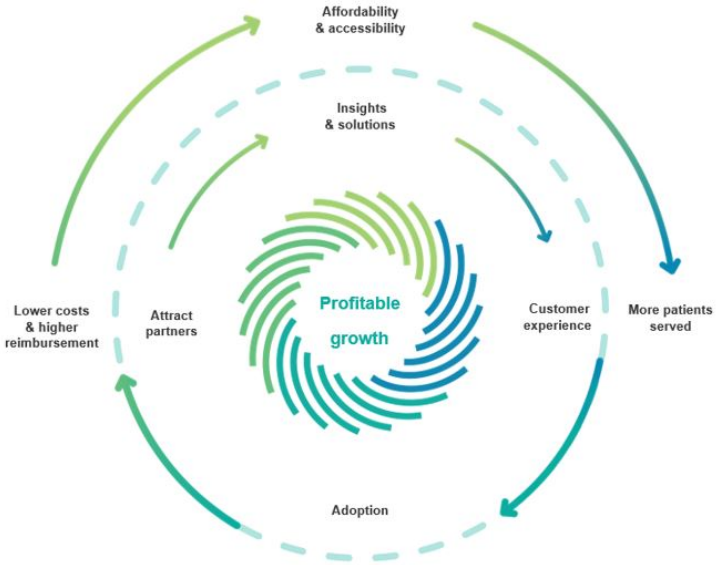
**Mission and strategy**

Invitae's mission is to bring comprehensive genetic information into mainstream medical practice to improve the quality of healthcare for billions of people.

We were founded on four core principles:

- Patients should own and control their own genetic information;
- Healthcare professionals are fundamental in ordering and interpreting genetic information;
- Driving down the price of genetic information will increase its clinical and personal utility; and
- Genetic information is more valuable when shared.

Our strategy for long-term, profitable growth centers on seven 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:




Those key drivers include:

- **Customer experience:** We see customer experience for patients, providers, and partners as integral to our long-term growth strategy and as an under-utilized catalyst to move genetics into mainstream medicine. Our view is that providing great service and enabling "ease-of-use", such as efficient ordering, comprehensive choices, and reliable turnaround time, are especially important for physicians.
- **Adoption:** As we improve customer experience, we expect more physicians would be open and more willing to increase genetic information in their practice. This is particularly true in fostering adoption among non-genetic experts, who are often the first contact for patients in a health journey. This work will be in parallel with our efforts in producing research supporting guideline expansion and broader advocacy for the benefits of genetic testing.

- **Attract partners.** As we continue to gain adoption and expand our reach, our value proposition to potential partners should increase. These include patient advocacy groups, biopharma partners that utilize our data, testing, network, and services, as well as health systems that intend to implement comprehensive precision medicine.
- **Insights and solutions:** In parallel with bringing new tools and products to the market, our capability to combine phenotypic and genotypic data, through both our genetic testing and third-party patient data, we believe produces a rich dataset that is highly attractive to biopharma partners, patient advocacy groups and more. We believe our services allow our strategic partners to be more precise and move faster with their efforts, such as identifying and recruiting patients, enabling Investigational New Drug (IND) filings, structuring clinical trials, and eventually bringing new therapies to market.
- **Lower cost and higher reimbursement:** As our network continues to scale, we expect to lower our costs and increase our margin, while continuing our pursuit of affordable prices to drive accessibility of genetic information. Our ability to sustainably provide affordable pricing is also expected to be balanced by our success in improving reimbursements and cash collection. Through the generation of scientific evidence and proactive engagement with stakeholders, we intend to pursue better payment and additional coverage.
- **Affordability and accessibility:** As we progress, we anticipate having more flexibility in our pricing strategy, aiming at more affordability and accessibility of our products for more patients.
- **More patients served:** All of these efforts should compound upon each other, expanding our reach and increasing the value of each offering, ultimately serving more patients.

Ultimately, we anticipate more solutions to further improve customer experiences, which in turn feed more answers for patients, foster greater adoption, and bring on more partners to create a flywheel effect.

**Business overview**

We are focused on making comprehensive, high-quality medical genetic testing information more accessible and instrumental to the healthcare ecosystem and stakeholders, including patients, healthcare providers, payers, biopharma partners, patient advocacy groups and more. We offer genetic testing across multiple clinical areas, including hereditary cancer, precision oncology, women’s health, rare diseases and pharmacogenomics. Medical genetics is central to health outcomes and we are working to bring it to the mainstream by enhancing the customer experience, lowering costs, removing barriers to adoption, and expanding insights and solutions. Ultimately, we expect the utility of the accumulated data will compound, enabling improved individual and population health and advancing the benefits of molecular medicine around the globe.

For the years ended December 31, 2022, 2021 and 2020, our revenue was $516.3 million, $460.4 million, and $279.6 million, respectively, and we incurred net losses of $3.1 billion, $379.0 million, and $602.2 million, respectively. For the three months ended March 31, 2023 and 2022, our revenue was $117.4 million and $123.7 million, respectively, and we recognized net losses of $192.2 million and $181.9 million, respectively. At March 31, 2023, our accumulated deficit was $5.0 billion.

In 2022, 2021 and 2020, we generated 1,290,000, 1,169,000 and 659,000 billable units, respectively. In the three months ended March 31, 2023, we generated 255,000 billable units compared to 322,000 billable units in the same period in 2022. We calculate volume using billable units, which are billable events that include individual test reports released and individual reactions shipped related to our precision oncology products. We refer to the set of reagents needed to perform a next generation sequencing ("NGS") test for our research use only ("RUO") product as a "reaction." As part of the strategic realignment, we discontinued the sale of and sublicensed to others our distributed precision oncology products, which includes our RUO kit and IVD product offerings. Approximately 36% of the billable volume generated in the first three months of 2023 were billable to patients and institutional customers (e.g., hospitals, clinics, medical centers, biopharmaceutical partners), and the remainder were billable to government and private insurance payers. Many of the gene tests on our assays are reimbursable by health insurance companies. However, when we do not have reimbursement policies or contracts with private insurers, or at times due to other situations, 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 payment requirement from the patient that may result in further delay in payment for these tests.

We believe that the keys to long-term profitable growth are:

- **Consistently improve the client experience:** efficient ordering; comprehensive choices; reliable turnaround time; easy-to-use;
- **Lower costs and higher reimbursement:** align our cost structure with our streamlined product portfolio and implement operational discipline; reduce the costs associated with performing our genetic tests; achieve broad reimbursement coverage for our tests from third-party payers and increase the amount we receive from other types of payers; focus our efforts on testing categories that are more regularly reimbursed to avoid the process of appeals and slow or non-existing payment;
- **Advance insights and solutions:** optimize the amount of genetic content we offer and is used by providers across the range of healthcare platforms; deliver actionable insights through digital health solutions; develop our data services;
- **Improve affordability and accessibility and serve more patients:** provide affordable pricing for genetic analysis and interpretation; partner to reach underserved populations; expand call points;
- **Drive adoption:** increase physician and patient utilization of our platform for ordering and delivery of results; and
- **Attract new partners:** increasing the number of strategic partners working with us to add value for all our customer segments.

**Strategic realignment**

On July 18, 2022, we initiated a strategic realignment of our operations and began implementing cost reduction programs in order to accelerate our path to positive operating cash flow. We are in the process of realigning and sharpening our focus on the portfolio of businesses that we believe can generate margins and deliver returns to fuel future investment. In the testing business, we have shifted operational and commercial efforts to accelerate positive cash flow by maintaining robust support of the higher-margin, higher-growth testing opportunities among hereditary cancer, precision oncology, women's health, rare disease and pharmacogenomics. We also plan to continue our expansion and integration of key digital health-based technologies and services in order to create a differentiated model in genetic health. Longer-term, we remain committed to our data platform and patient network. We believe that we hold significant growth potential and intend to continue to prioritize the tools, partnerships and applications that support the development of this platform as the catalyst for the future of healthcare.

The strategic realignment included a reduction in workforce of approximately 1,000 positions, lab and office space consolidation, portfolio optimization, decrease in other operating expenses, as well as a reduced international footprint. Management currently expects the strategic realignment will be completed in 2023 and estimates that the total costs incurred may be up to $170 million for associated employee severance and benefits, asset impairments and losses on disposals of long-lived assets, and other restructuring costs related to the realignment. This reflects the best estimate of management as of the date hereof, which may be revised in subsequent periods as the strategic realignment progresses. The estimate of total cost incurred excludes the $47.4 million gain on the sale of the RUO kit assets recognized during the three months ended December 31, 2022. We anticipate annualized cash savings of approximately $326 million, which is expected to be fully realized by the end of 2023. We may not realize, in full or in part, the anticipated annualized cash savings due to unforeseen difficulties or delays in implementing further decreases in other operating expenses.

We expect to continue to incur operating losses for the near term as we execute the strategic realignment of our operations. If we are unable to achieve these objectives and successfully grow revenue and manage our costs, we may not be able to achieve positive operating cash flow in the near term or at all.

**Russia and Ukraine Conflict**

During the first quarter of 2022, Russia commenced a military invasion of Ukraine, and the ensuing conflict has created disruption in the region and around the world. We have suspended operations in Russia, which has not had and is not expected to have a material impact on our operating results. We serve customers globally across a broad geographic base. Neither Russia nor Ukraine has comprised or is expected to comprise a material portion of our total revenue, net loss, or net assets. We continue to closely monitor the ongoing conflict and related sanctions, which could impact our financial results in the future. Other impacts due to this evolving situation are currently unknown and could potentially subject our business to adverse consequences should the situation escalate beyond its current scope. See Part II, Item 1A. "Risk Factors" in this Quarterly Report on Form 10-Q for additional

information about the conflict between Russia and Ukraine and its potential effect on our business and results of operations.

**Adverse macroeconomic conditions**

Adverse macroeconomic developments, including inflation, slowing growth, rising interest rates, or recession, may adversely affect our business and financial condition. These developments have caused, and could in the future cause, disruptions and volatility in global financial markets, including in banking and financial institutions, and increased rates of default and bankruptcy, and negatively affect business and consumer spending. Adverse economic conditions may also increase the costs of operating our business, including vendor, supplier and workforce expenses, and may limit our access to capital or may significantly increase our cost of capital. Management continues to evaluate the impact of macroeconomic events, including inflation, on our business and our future plans and intends to take appropriate measures to help alleviate their impact, but there can be no assurance that these efforts will be successful.

**Impact of COVID-19**

We expect the COVID-19 pandemic may continue to impact our business. We have reviewed and adjusted, when necessary, for the impact of COVID-19 on our estimates related to revenue recognition and expected credit losses.

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. Substantially all of the Company's offices have re-opened in a hybrid working model, subject to operating restrictions which adhere to healthcare guidelines to protect public health and the health and safety of employees. We continue to monitor, update and align our corporate policies to meet state and federal occupational health and safety rules. While we have not experienced significant disruption in our supply chain, we have experienced supply delays as a result of the COVID-19 pandemic and have also had to obtain supplies from new suppliers.

As a result of government-imposed restrictions, many announced healthcare guidelines resulted in 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, continued 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 position us well to provide a range of testing to clinicians and patients using a "clinical care from afar" model. An example is our Gia telehealth platform, which expands access to remote interaction between patients and clinicians as well as direct ordering of genetic tests.

Although many government-imposed restrictions have been reduced or eliminated, the future impact of the COVID-19 pandemic continues to be highly uncertain. Given the unknown duration and extent of COVID-19's impact on our business, and the healthcare system in general, we continue to monitor evolving market conditions and have pivoted our focus and investments on the commercial execution of workflows that support remote ordering, online support and telehealth.

**Factors affecting our performance**

***Number of billable units***

Our test revenue is tied to the number of tests which we bill patients, third-party payers that pay on behalf of patients, and institutions (e.g., hospitals, clinics, medical centers, biopharmaceutical partners). We refer to billable events that include individual test reports released and individual reactions shipped as billable units. We refer to the set of reagents needed to perform an NGS test for our RUO kit product as a "reaction." We typically bill for our services following delivery of the billable report derived from testing samples and interpreting the results. For units manufactured for use by customers in distributed facilities, we typically bill customers upon shipment of those units. Test orders are placed under signed requisitions or contractual agreements, as we often enter into contracts with insurance companies and institutions. We incur the expenses associated with a unit in the period in which the unit is processed regardless of when payment is received with respect to that unit. We believe the number of billable units in any period is an important indicator of the growth in our testing business, and with time, this will translate into the number of customers accessing our platform.

***Number and size of research and commercial partnerships***

Pharma development service revenue, which we recognize within other revenue in our condensed consolidated statements of operations, is generated primarily from services provided to biopharmaceutical companies and other partners and is related to companion diagnostic development, clinical research, and clinical trial services across the research, development and commercialization phases of collaborations. The result of these relationships may include the development of new targeted companion diagnostics, which underscore and expand the need for genetic testing and in some cases may lead to intellectual property and/or revenue sharing opportunities with third-party partners. As a result of the strategic realignment, we terminated early or changed the scope of certain collaborations as part of our pharma development services, and are in the process of supporting wind-down activities for certain companion diagnostic development agreements to conclude existing contracts.

***Success obtaining and maintaining reimbursement***

Our ability to increase volume and 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 332 million lives, comprised of Medicare, all national commercial health plans, and Medicaid in most states, including California (Medi-Cal), our home state.

***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. 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.

***Ability to optimize our genetic content in meeting market needs and create new pathways to test***

We intend to continue to reduce the average cost per test, optimize our test menus and content, and offer the tests at affordable prices in order to meet customer and patient needs. In addition, we have and intend to continue to identify new ways to connect our testing services and information to patients. These include direct patient outreach and ordering capacity, the use of automated assistants for physician customers to improve the ease of ordering and processing genetic tests and programs designed to reach underserved patient populations with genetic testing. We also continue to collaborate with strategic partners and identify new market and channel opportunities.

***Realignment of our business and timing of expenses***

As part of the strategic business realignment of our operations announced in July 2022, we initiated a comprehensive plan focused on supporting business lines and geographies that we believe can generate sustainable margins, provide the best return to fuel future investment and accelerate the company's path to positive cash flow. We believe the plan further helps ensure we remain at the forefront of innovation and advancements in genomics by allocating resources towards our core genetic testing and data and patient network platform that have the potential to improve healthcare outcomes.

We conducted an assessment of our product portfolio as well as the associated research and development and commercial spending. Our plan shifts the focus to programs relevant to the core testing business to drive profitable growth. We also performed an extensive review of internal and external costs and how those expenses align with the business structure. Additional savings are expected to be generated through the ongoing digitization

of workflows, elimination of duplication and streamlined processes across the core platforms and rationalization of technology and external services.

As we refocus our operations on our core genomic testing platform, we also plan to continue to invest in our genetic testing and data business to drive long-term profitable growth. We deploy state-of-the-art technologies in our genetic testing services, and we intend to continue to scale our infrastructure, including our testing capacity and capabilities as well as our information systems. We also expect to incur software development costs as we seek to further digitize and automate our laboratory processes and our genetic interpretation and report sign-out procedures, scale our customer service capabilities to improve our clients' experience, and expand the functionality of our website. We will continue to incur costs related to marketing and branding as we expand our initiatives beyond our current customer base and focus on providing access to customers through our website. In addition, we will 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 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, or upon shipment of our precision oncology products. 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 payments, the existence of secondary payers and claim denials. Some test orders are placed under signed requisitions or contractual agreements, and we often enter into contracts with insurance companies and institutions that include pricing provisions under which such tests are billed.

Pharma development service revenue is generated primarily from custom assay design services, sample processing activities and consultative inputs, which is separate from revenue generated by any related or unrelated product component. Subsequent to the strategic realignment, pharma development service revenue is generated from personalized cancer monitoring services and sample processing activities. Revenue is recognized as services are provided using the input method based on our assessment of performance completed to date toward completion of a contract.

**Financial overview**

***Revenue***

We primarily generate revenue from testing services and sales of distributed precision oncology products. Customers are typically billed upon delivery of test results or shipment of products. We also generate revenue from development agreements, access to data, data analytics and other related services provided for biopharma partners and other parties. Our ability to increase our revenue will depend on our ability to increase our market penetration, obtain contracted reimbursement coverage from third-party payers and increase the amount we receive from other types of payers, improve payer collections, and grow our relationships with biopharma partners.

As a result of the strategic realignment, we exited certain product lines including our distributed precision oncology products and terminated early or changed the scope of certain collaborations as part of our pharma development services. We are in the process of supporting wind-down activities for certain companion diagnostic development agreements to conclude existing contracts.

***Cost of revenue***

Cost of revenue reflects the aggregate costs incurred in delivering our products and services and includes expenses for materials and supplies, personnel-related costs, freight, costs for lab services, genetic interpretation and clinical trial support, equipment and infrastructure expenses and allocated overhead including rent, information technology, equipment depreciation, amortization of acquired intangibles, and utilities. We expect cost of revenue to generally increase in line with an increase in billable volume. We also expect amortization of acquired intangible assets, which is not dependent on billed volume, to remain consistent with 2022 expenses. We anticipate our cost per unit for existing tests will generally decrease over time due to the efficiencies we expect to gain as volume increases, and from other cost reductions achieved through automation, supply chain and logistics initiatives, process standardization, and other cost reductions. These reductions in cost per unit will likely be offset by new offerings, which often have higher costs per unit during the introductory phases before we are able to gain efficiencies. The cost per unit may fluctuate significantly from quarter to quarter.

***Operating expenses***

Our operating expenses are classified into three categories related to our operational activities: research and development, selling and marketing, and general and administrative. For each category, the largest component is generally personnel-related costs, which include salaries, employee benefit costs, bonuses, commissions, as applicable, and stock-based compensation expense. Operating expenses also include restructuring and other costs, which is discussed below.

*Research and development*

Research and development expenses represent costs incurred to develop our technology and future offerings. These costs are principally for process development associated with our efforts to expand the number of genes we can evaluate, our efforts to lower the costs per unit and our development of new products to expand our platform. We have and may continue to partner with other companies to develop new technologies and capabilities we expect to invest capital and incur significant operating costs to support these development efforts. In addition, we incur process development costs to further develop the software we use to operate our laboratories, analyze generated data, process customer orders, validate clinical activities, 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, amortization of acquired intangible assets, and allocated overhead including rent, information technology, equipment depreciation and utilities.

We expense all research and development costs in the periods in which they are incurred. We expect our research and development expenses to decrease in fiscal year 2023 as compared to fiscal year 2022 as we streamline our product portfolio, shift investments, including the exit of certain business lines and commercial geographies, and reduce labor costs through a reduction in workforce. We expect to make investments to reduce costs and streamline our technology to provide patients access to testing aligned to scale with our long-term profitable growth targets.

*Selling and marketing*

Selling and marketing expenses consist of personnel-related costs, including commissions, 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 fiscal year 2023 as compared to fiscal year 2022 as a result of a reduction in workforce, targeted sales force expansion and lower marketing spending as a result of a more efficient sales and marketing approach to support our core genetic testing platform.

*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 fiscal year 2023 as compared to fiscal year 2022 as a result of our strategic realignment including a reduction in workforce, consolidation of underutilized facilities, digitization of workflows, elimination of duplication and streamlined processes, and rationalization of technology and external services spending.

*Restructuring and other costs*

Restructuring and other costs include employee severance and benefits, asset impairments and losses on disposals of long-lived assets and other costs. Employee severance and benefit costs are comprised of severance, other termination benefit costs, and stock-based compensation expense for the acceleration of RSUs related to workforce reductions. Employee severance and benefit costs include one-time termination benefits that are recognized as a liability at estimated fair value, at the time of communication to employees, unless future service is required, in which case the costs are recognized ratably over the future service period. Ongoing termination benefits are recognized as a liability at estimated fair value when the amount of such benefits is probable and reasonably estimable. Asset impairments and losses on disposals of long-lived assets include operating lease impairments and losses on disposals of property and equipment and leasehold improvements associated with the exit of certain lab and office space. Other restructuring costs include professional fees and contract exit costs.

*Other (expense) income, net*

Other (expense) income, net primarily consists of loss on extinguishment of debt, net, debt issuance costs, changes in the fair value of convertible senior secured notes and our acquisition-related liabilities, and interest income generated from our cash equivalents and marketable securities.

***Interest expense***

Interest expense is primarily attributable to interest incurred related to our debt and finance leases. See Note 7, “Commitments and contingencies” in Notes to Condensed Consolidated Financial Statements in Part I, Item 1. of this Quarterly Report on Form 10-Q for additional information.

***Income tax benefit***

Since we generally establish a full valuation allowance against our deferred tax assets, our income tax benefit primarily consists of changes in our deferred tax realization assessments as a result of taxable temporary differences assumed in connection with our acquisitions and changes in the expected timing of the reversal of taxable temporary differences.

**Critical accounting policies and estimates**

Management’s discussion and analysis of our financial condition and results of operations is based on our condensed 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 our 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.

The following discussion is related to estimating the fair value of our new Senior Secured 2028 Notes as of March 31, 2023, and should be read in conjunction with our critical accounting policies and estimates disclosed in our Annual Report on Form 10-K for the fiscal year ended December 31, 2022. Except as presented below, there have been no material changes from the critical accounting policies and estimates described in our Annual Report on Form 10-K. See Note 2, "Summary of significant accounting policies" in the Notes to Condensed Consolidated Financial Statements in Part I, Item 1. of this Quarterly Report on Form 10-Q for information regarding recent accounting pronouncements.

***Fair value of Senior Secured 2028 Notes***

We elected the fair value option to measure our Senior Secured 2028 Notes due to the complexity of the various conversion and settlement options available to both the holders of such notes and Invitae. We utilize the binomial lattice model, specifically a lattice model to estimate the fair value of the convertible senior secured notes at issuance and subsequent reporting dates. The estimated fair value of the Senior Secured 2028 Notes is determined using Level 3 inputs and assumptions unobservable in the market. This model incorporates the terms and conditions of the Senior Secured 2028 Notes and assumptions related to stock price, expected stock price volatility, risk-free interest rate, market credit spread, and cost of debt. The stock price is based on the publicly traded price of our common stock as of the measurement date. We estimate the volatility of our stock price based on the historical and implied volatilities of our publicly traded common stock. The risk-free interest rate is based on interpolated U.S. Treasury rates, commensurate with a similar term to the Senior Secured 2028 Notes. We will record changes in fair value, inclusive of accrued interest, through the condensed consolidated statements of operations as a fair value adjustment of the convertible senior secured debt each reporting period, with the portion of the change that results from a change in the instrument-specific credit risk recorded separately in the condensed consolidated statements of comprehensive loss, if applicable.

As of March 31, 2023, the estimated fair value of the Senior Secured 2028 Notes was $282.9 million. The portion of the estimated fair value of Series A Notes for which conversion is subject to stockholder approval and for which we have a cash settlement obligation is classified as a current liability with the remainder classified as a long-

term liability in the condensed consolidated balance sheets. The current liability was determined based on the product of the shares of common stock in excess of the NYSE Cap multiplied by the arithmetic average of the volume weighted average price of our common stock on each of the five consecutive trading dates immediately preceding March 31, 2023. The long-term liability represents the portion of the Senior Secured 2028 Notes for which we have the intent and the ability to settle the obligations by issuing shares.

The determination of fair value requires considerable judgment and is highly sensitive to changes in underlying assumptions. Remeasuring the fair value of our Senior Secured 2028 Notes on a recurring basis through earnings requires the estimation of significant unobservable inputs, which involve inherent uncertainties and application of management judgment. Using different estimates or assumptions would have materially affected our results. For example, as of March 31, 2023:

- A 1,000 basis point, or ten percent, decrease or increase to the estimated stock price assumption would have decreased or increased, respectively, the estimated fair value of our Senior Secured 2028 Notes and increased or decreased, respectively, the associated gains recognized through first quarter 2023 earnings by $12.2 million and $10.1 million, respectively.
- A 1,000 basis point, or ten percent, decrease or increase to the cost of debt assumption would have increased or decreased, respectively, the estimated fair value of our Senior Secured 2028 Notes and decreased or increased, respectively, the associated gains recognized through first quarter 2023 earnings by $10.9 million and $12.1 million, respectively.
- A 1,000 basis point, or ten percent, decrease or increase to the estimated stock price volatility assumption would have decreased or increased, respectively, the estimated fair value of our Senior Secured 2028 Notes and increased or decreased, respectively, the associated gains recognized through first quarter 2023 earnings by $7.3 million and $4.8 million, respectively.

**Results of operations**

***Three Months Ended March 31, 2023 and 2022***

The following sets forth our condensed 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 |
|---|---|---|---|---|
| | 2023 | 2022 | | |
| Revenue: | | | | |
| Test revenue | $ 112,623 | $ 119,497 | $ (6,874) | (6)% |
| Other revenue | 4,733 | 4,194 | 539 | 13% |
| Total revenue | 117,356 | 123,691 | (6,335) | (5)% |
| Operating expenses: | | | | |
| Cost of revenue | 88,442 | 97,116 | (8,674) | (9)% |
| Research and development | 61,978 | 128,236 | (66,258) | (52)% |
| Selling and marketing | 44,510 | 60,144 | (15,634) | (26)% |
| General and administrative | 45,241 | 51,428 | (6,187) | (12)% |
| Restructuring and other costs | 52,556 | — | 52,556 | 100% |
| Total operating expenses | 292,727 | 336,924 | (44,197) | (13)% |
| Loss from operations | (175,371) | (213,233) | 37,862 | 18% |
| Other (expense) income, net: | | | | |
| Loss on extinguishment of debt, net | (10,822) | — | (10,822) | (100)% |
| Debt issuance costs | (19,859) | — | (19,859) | (100)% |
| Change in fair value of convertible senior secured notes | 18,304 | — | 18,304 | 100% |
| Change in fair value of acquisition-related liabilities | 218 | 10,003 | (9,785) | (98)% |
| Other income, net | 5,883 | 436 | 5,447 | NM |
| Total other (expense) income, net | (6,276) | 10,439 | (16,715) | NM |
| Interest expense | (11,496) | (13,985) | 2,489 | 18% |
| Net loss before taxes | (193,143) | (216,779) | 23,636 | 11% |
| Income tax benefit | 960 | 34,920 | (33,960) | (97)% |
| Net loss | $ (192,183) | $ (181,859) | $ (10,324) | (6)% |

NM - Not Meaningful

*Revenue*

The decrease in total revenue of $6.3 million for the three months ended March 31, 2023 compared to the same period in 2022 was primarily due to decreased billable volume partially offset by higher average revenue per billable unit. Billable volume decreased due to the exit of certain product offerings, including the RUO kit and IVD product offerings, and geographies as a result of the strategic realignment. Billable volume decreased to approximately 255,000 in the three months ended March 31, 2023 compared to 322,000 in the same period of 2022, a decrease of 21 percent. Average revenue per billable unit was $442 per unit in the three months ended March 31, 2023 compared to $372 per unit in the comparable prior period primarily due to changes in payer and product mix.

*Cost of revenue*

The decrease in the cost of revenue of $8.7 million for the three months ended March 31, 2023 compared to the same period in 2022 was primarily due to a decrease in billable volume, partially offset by a higher cost per billable unit. Cost per unit was $347 in the three months ended March 31, 2023 compared to $302 for the same period in 2022. The cost per unit increased primarily due to lower billable volume and an increase in amortization of acquired intangible assets of $9.0 million due to a full quarter of amortization expense in 2023 as compared to a partial quarter of amortization expense in 2022 due to the completion of certain in-process research and development ("IPR&D") assets. This increase was offset by lower lab materials costs of $10.8 million primarily due to a decrease in volume related to the exit of certain product offerings and geographies as a result of the strategic realignment, and change in mix of materials, decreases in personnel-related costs of $4.4 million due to a reduction in workforce related to our strategic realignment, decreases in information technology costs of $1.1 million due to lower spending on software licenses and cloud computing, and decreases in other costs of $1.4 million.

*Research and development*

The decrease in research and development expense of $66.3 million for the three months ended March 31, 2023 compared to the same period in 2022 was primarily due to lower personnel-related expenses of $40.7 million due to the reduction in workforce related to our strategic realignment, decreases in in lab-related expenses of $10.9 million as a result of lower costs related to external development projects and lab supplies and services, decreases in information technology costs of $4.4 million due to lower spending on software licenses and cloud computing, decreases in facilities-related expenses of $3.7 million due to lower lease expenses and security and building support costs, decreases in professional fees of $3.7 million due to lower contract labor, and decreases in other expenses of $2.9 million.

*Selling and marketing*

The decrease in selling and marketing expense of $15.6 million for the three months ended March 31, 2023 compared to the same period in 2022 was primarily due to lower personnel-related expenses of $11.9 million due to the reduction in workforce related to our strategic realignment, decreases in marketing costs of $0.7 million as a result of lower spending on brand initiatives and adverting, and decreases in other expenses of $3.0 million.

*General and administrative*

The decrease in general and administrative expense of $6.2 million for the three months ended March 31, 2023 compared to the same period in 2022 was primarily due to lower personnel-related costs of $8.4 million primarily due to the reduction in workforce related to our strategic realignment, and decreases in professional and outside services of $3.0 million due to lower contract labor. These decreases were partially offset by lower functional overhead expense allocations related to information technology and facilities-related expenses of $5.2 million.

*Restructuring and other costs*

During the three months ended March 31, 2023, we incurred restructuring and other costs of $52.6 million. Restructuring and other costs were comprised of $50.4 million in impairments and losses on disposals of long-lived assets, net, $1.3 million in employee severance and benefits, and $0.9 million in other restructuring expenses. We did not have similar expenses for the three months ended March 31, 2022. See Note 10, “Restructuring and other costs" in Notes to the Condensed Consolidated Financial Statements in Part I, Item 1. of this Quarterly Report on Form 10-Q for further information.

*Loss on extinguishment of debt, net*

During the three months ended March 31, 2023, we incurred a net loss on extinguishment of debt of $10.8 million. In connection with the settlement of our 2020 Term Loan in February 2023, we incurred debt extinguishment costs of $19.3 million, composed of an $11.2 million write-off of unamortized debt issuance costs and $8.1 million of prepayment fees. In February 2023, we also entered into purchase and exchange agreements with certain holders of the outstanding 2024 Notes for the new Senior Secured 2028 Notes, shares of common stock, and cash. These exchanges resulted in a gain on extinguishment of debt of $8.5 million related to the 2024 Notes. See Note 7, “Commitments and contingencies" in Notes to the Condensed Consolidated Financial Statements in Part I, Item 1. of this Quarterly Report on Form 10-Q for further information.

*Debt issuance costs*

During the three months ended March 31, 2023, we incurred debt issuance costs of $19.9 million related to the issuance of our Senior Secured 2028 Notes. See Note 7, “Commitments and contingencies" in Notes to the Condensed Consolidated Financial Statements in Part I, Item 1. of this Quarterly Report on Form 10-Q for further information.

*Change in fair value of convertible senior secured notes*

During the three months ended March 31, 2023, we recorded a gain of $18.3 million related to the change in fair value of our Senior Secured 2028 Notes. We elected the fair value option to account for our Senior Secured 2028 Notes, which requires the notes to be measured at their issue-date estimated fair value and then subsequently remeasured at estimated fair value as of each reporting date. The gain during the three months ended March 31, 2023 was primarily due to the decrease in our stock price since the issue-date estimated fair value. See Note 6, “Fair value measurement" and Note 7, “Commitments and contingencies" in Notes to the Condensed Consolidated Financial Statements in Part I, Item 1. of this Quarterly Report on Form 10-Q for further information.

*Change in fair value of acquisition-related liabilities*

The decrease in change in fair value of acquisition-related liabilities of $9.8 million for the three months ended March 31, 2023 compared to the same period in 2022 was primarily due to a decrease in fair value adjustments related to our stock payable liabilities as a result of the decrease in the price of our common stock and settlement of acquisition-related hold-backs.

*Other income, net*

The increase in other income, net of $5.4 million for the three months ended March 31, 2023 compared to the same period in 2022 was primarily due to an increase in interest income earned on our marketable securities investments.

*Interest expense*

The decrease in interest expense of $2.5 million for the three months ended March 31, 2023 compared to the same period in 2022 was primarily due to the repayment of the 2020 Term Loan in February 2023.

*Income tax benefit*

The decrease in income tax benefit of $34.0 million for the three months ended March 31, 2023 compared to the same period in 2022 was primarily due to a $34.6 million release of federal and state valuation allowances for the three months ended March 31, 2022 as a result of the reclassification of ArcherDX's STRATAFIDE and PCM in-process research and development intangibles from indefinite-lived intangibles to developed technology, which enabled the associated deferred tax liability to serve as a source of income to existing finite-lived deferred tax assets for which a valuation allowance had previously been established. There was no similar income tax benefit in the current period for the three months ended March 31, 2023.

**Liquidity and capital resources**

***Liquidity and capital expenditures***

We have generally incurred net losses since our inception. For the three months ended March 31, 2023 and 2022, we had net losses of $192.2 million and $181.9 million, respectively, and we expect to incur additional losses in the future. At March 31, 2023, we had an accumulated deficit of $5.0 billion. 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 fees collected from our customers, net proceeds from sales of our capital stock as well as borrowing from debt facilities and the issuance of convertible senior notes.

In the third quarter of 2022, we issued 2.4 million shares of common stock at an average price of $3.99 per share in an "at the market" offering for aggregate proceeds of $10.0 million and net proceeds of $9.7 million.

In September 2019, we issued $350.0 million of aggregate principal amount of 2024 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 the 2024 Notes to settle our note purchase agreement we entered into in November 2018. In April 2021, we issued $1,150.0 million of aggregate principal amount of 2028 Notes, which bear cash interest at a rate of 1.5% per year.

In February 2023, we entered into purchase and exchange agreements with certain holders of the outstanding 2024 Notes. Under the terms of the agreements, we (a) exchanged $305.7 million aggregate principal amount of 2024 Notes for $275.3 million aggregate principal amount of Series A Notes and 14,219,859 shares of common stock and (b) issued and sold $30.0 million aggregate principal amount of Series B Notes for cash. The Senior Secured 2028 Notes bear cash interest at a rate of 4.50% per year.

Prior to such time that we obtain stockholder approval for the issuance of shares of common stock in excess of the limitations imposed by the NYSE Cap, holders of the Series A Notes are prohibited from converting their notes or exercising any warrants issued in respect of those notes in excess of such NYSE Cap and we would instead be required to settle any conversion in cash if we are not able to obtain the stockholder approval prior to September 30, 2023. The cash settlement amount upon conversion of a Series A Note by a holder prior to stockholder approval is equal to the product of the shares of common stock in excess of the NYSE Cap multiplied by the arithmetic average of the volume weighted average price of our common stock on each of the five consecutive trading days immediately preceding the conversion date. After obtaining stockholder approval, the full amount of the outstanding balance of the Senior Secured 2028 Notes will be convertible into shares of common stock, with no conversion limitations. We intend to seek to obtain such stockholder approval at our annual meeting scheduled to be held on June 5, 2023. There can be no assurance that we will be successful in obtaining stockholder approval for the proposal to approve the issuance of shares of common stock pursuant to the conversion of the Senior Secured 2028 Notes or the exercise of any warrants issued in respect to the Senior Secured 2028 Notes in excess of the limitations imposed by the NYSE Cap prior to September 30, 2023. If we fail to obtain stockholder approval, we may not have enough available cash or be able to obtain financing at the time we are required to settle any conversion.

Our ability to make scheduled payments of the principal of, to pay interest on or to refinance our indebtedness depends on our future performance, which is subject to economic, financial, competitive and other factors beyond our control. Our business may not generate cash flow from operations in the future sufficient to service our debt, including paying off the principal when due, and make necessary capital expenditures. Holders of our convertible senior 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, which could adversely affect our liquidity. However, we only have limited ability to make those cash payments under our credit agreement and, even if the credit agreement limitations are no longer in effect, 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 or to repay outstanding notes when they mature.

In October 2020, in connection with our acquisition of ArcherDX, we entered into a credit facility to borrow $135.0 million which closed concurrently with the merger. The terms of this credit facility restrict our ability to incur certain indebtedness, pay dividends, make acquisitions and take other actions. In February 2023, we repaid, prior to

maturity date, the principal balance outstanding of $135.0 million plus accrued interest of $2.6 million and prepayment fees of $8.1 million.

At March 31, 2023 and December 31, 2022, we had $171.2 million and $267.5 million, respectively, of cash, cash equivalents, and restricted cash and marketable securities of $217.5 million and $289.6 million, respectively. Our primary use of cash is to fund our operations. 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 inception, and we expect to continue to incur losses in the near future. We believe our existing cash, cash equivalents and marketable securities as of March 31, 2023 and fees collected from the sale of our products and services will be sufficient to meet our anticipated cash requirements for at least the next 12 months.

We expect to raise additional funding to finance operations and service debt obligations prior to achieving profitability or should we make additional acquisitions. We regularly consider fundraising opportunities and expect to determine the timing, nature and size of future financings based upon various factors, including market conditions, debt maturities and our operating plans. We may in the future elect to finance operations by selling equity or debt securities or borrowing money. 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 may 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, | |
|---|---|---|
| | 2023 | 2022 |
| Net cash used in operating activities | $ (34,398) | $ (147,543) |
| Net cash provided by (used in) investing activities | 73,878 | (449,456) |
| Net cash used in financing activities | (135,768) | (920) |
| Net decrease in cash, cash equivalents and restricted cash | $ (96,288) | $ (597,919) |

***Cash flows from operating activities***

For the three months ended March 31, 2023, cash used in operating activities of $34.4 million principally resulted from our net loss of $192.2 million, an $18.3 million gain related to the change in fair value of convertible senior secured notes, $2.9 million of amortization of premiums and discounts on investment securities, a $1.0 million income tax benefit, and non-cash charges for remeasurements of liabilities in connection with business combinations of $0.2 million. These were partially offset by non-cash charges of $50.4 million related to impairments and losses on disposals of long-lived assets, $35.0 million for depreciation and amortization, $29.2 million for stock-based compensation, $19.9 million of debt issuance costs, $10.8 million of loss on extinguishment of debt, $3.1 million of non-cash lease expense, $3.0 million for amortization of debt discount and issuance costs related to our outstanding debt, $0.8 million of post-combination share-based compensation expense, and other activities of $0.8 million. The net effect on cash for changes in net operating assets was an increase of cash of $27.2 million.

For the three months ended March 31, 2022, cash used in operating activities of $147.5 million principally resulted from our net loss of $181.9 million, a $34.9 million income tax benefit and non-cash charges for remeasurements of liabilities in connection with business combinations of $9.8 million. These were partially offset by non-cash charges of $46.8 million for stock-based compensation, $27.1 million for depreciation and amortization, $3.9 million for amortization of debt discount and issuance costs related to our outstanding debt and $1.7 million of post-combination expense. The net effect on cash for changes in net operating assets was a decrease in cash of $2.8 million.

***Cash flows from investing activities***

For the three months ended March 31, 2023, cash provided by investing activities of $73.9 million was primarily due to net purchases and maturities of marketable securities of $75.2 million and cash used for purchases of property and equipment of $1.3 million.

For the three months ended March 31, 2022, cash used in investing activities of $449.5 million was primarily due to net purchases and maturities of marketable securities of $428.6 million, and cash used for purchases of property and equipment of $20.8 million.

***Cash flows from financing activities***

For the three months ended March 31, 2023, cash used in financing activities of $135.8 million primarily consisted of the repayment of the 2020 Term Loan of $135.0 million, debt issuance costs related to the convertible senior notes exchange and prepayment fees on our 2020 Term Loan of $28.0 million, settlement of acquisition obligations of $1.5 million, and finance lease principal payments of $1.3 million. These were partially offset by proceeds from the issuance of Series B Notes of $30.0 million.

For the three months ended March 31, 2022, cash used in financing activities of $0.9 million primarily consisted of finance lease principal payments of $1.3 million as well as cash received from issuances of common stock of $0.4 million.

**Contractual obligations**

The following table summarizes our contractual obligations, including interest, as of March 31, 2023 (in thousands):

| Contractual obligations: | Remainder of 2023 | 2024 and 2025 | 2026 and 2027 | 2028 and beyond | Total |
|---|---|---|---|---|---|
| Operating leases | $ 17,928 | $ 54,807 | $ 39,759 | $ 98,429 | $ 210,923 |
| Finance leases | 4,154 | 3,839 | — | — | 7,993 |
| Convertible senior notes | — | 44,269 | — | 1,150,000 | 1,194,269 |
| Convertible senior secured notes | — | — | — | 305,257 | 305,257 |
| Purchase commitments | 17,388 | 17,425 | 750 | — | 35,563 |
| Total | $ 39,470 | $ 120,340 | $ 40,509 | $ 1,553,686 | $ 1,754,005 |

Operating lease maturity amounts included in the table above do not include sublease income expected to be received under our subleases. We expect to receive sublease income for fiscal years ending December 31, 2023, 2024 and 2025 of $0.7 million, $0.9 million and $0.1 million, respectively.

See Note 7, "Commitments and contingencies" in the Notes to Condensed Consolidated Financial Statements in Part I, Item 1. of this Quarterly Report on Form 10-Q 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 in Part I, Item 1. of this Quarterly Report on Form 10-Q 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 $388.7 million at March 31, 2023, and consisted primarily 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, 2023, 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 marketable securities. Fluctuations in the value of our cash equivalents and marketable securities caused by a change in interest rates (gains or losses on the carrying value) are recorded in other comprehensive (loss) income and are realized if we sell the underlying securities prior to maturity.

In February 2023, we repaid our 2020 Term Loan including the principal balance outstanding of $135.0 million plus accrued interest of $2.6 million. We did not use interest rate derivative instruments to manage our exposure to interest rate fluctuations related to our 2020 Term Loan prior to repayment.

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, 2023, the fair market value of the 2024 Notes and 2028 Notes was $38.9 million and $492.4 million, respectively. We elected the fair value option to account for the Senior Secured 2028 Notes, which requires the notes to be remeasured at estimated fair value as of each reporting date. Under the fair value election, we will record changes in fair value, inclusive of related accrued interest, through the condensed consolidated statement of operations as a fair value adjustment of the Senior Secured 2028 Notes each reporting period, with the portion of the change that results from a change in the instrument-specific credit risk recorded separately in other comprehensive income, if applicable. Fluctuations and volatility of our stock price can significantly affect the estimated fair value of the Senior Secured 2028 Notes and the corresponding change in fair value as of each reporting period. For additional information about the convertible senior notes, see Note 6, "Fair value measurements" and Note 7, “Commitments and contingencies” in Notes to Condensed Consolidated Financial Statements in Part I, Item 1. of this Quarterly Report on Form 10-Q.

**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 ("SEC") rules and forms, and that such information is accumulated and communicated to our management, including our principal executive officer and principal financial 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 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.

For discussion of legal matters as of March 31, 2023, see Note 7, "Commitments and contingencies" in Notes to Condensed Consolidated Financial Statements in Part I, Item 1. of this Quarterly Report on Form 10-Q, which is incorporated to this item by reference.

### ITEM 1A. Risk Factors

#### Risks related to our business and strategy

***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, 2023 and 2022, we had net losses of $192.2 million and $181.9 million, respectively. For the years ended December 31, 2022, 2021 and 2020, our net losses were $3.1 billion, $379.0 million and $602.2 million, respectively. At March 31, 2023, our accumulated deficit was $5.0 billion. We expect to continue to incur significant losses as we invest in our business. We incurred research and development expenses of $62.0 million and $128.2 million for the three months ended March 31, 2023 and 2022, respectively, and selling and marketing expenses of $44.5 million and $60.1 million for the three months ended March 31, 2023 and 2022, respectively. We incurred research and development expenses of $402.1 million, $416.1 million and $240.6 million in 2022, 2021 and 2020, respectively, and selling and marketing expenses of $218.9 million, $225.9 million and $168.3 million in 2022, 2021 and 2020, respectively. Since 2021, widespread inflationary pressures were experienced across global economies, resulting in higher costs for our raw materials, non-material costs, labor and other business costs, and significant increases in the future could adversely affect our results of operations. In addition, as a result of the integration of acquired businesses, we may be subject to unforeseen or additional expenditures, costs or liabilities, including costs and potential liabilities associated with litigation. 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. Our prospects must be considered in light of the risks and difficulties frequently encountered by companies in a similar 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; continue to implement and successfully execute our business and marketing 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 employees; continue to expand, automate and upgrade our laboratory, technology and data systems; obtain, maintain and expand coverage and reimbursement by healthcare payers; obtain and maintain sufficient payment by partners, institutions and individuals; 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.

***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 we will need to 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. In addition, the terms of our credit agreement restrict our ability to incur certain indebtedness and issue certain equity securities. 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 companies or 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 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.

***Our strategic realignment and the associated headcount reduction have and are expected to significantly change our business, result in significant expense, may not result in anticipated savings, and will disrupt our business.***

On July 18, 2022, we initiated a strategic realignment of our operations and began implementing programs to reduce operating costs and drive future growth aligned with our core genetic testing and data platform and patient network. This realignment involves a significant reduction in our workforce as well as other steps to streamline our operations, including exiting our distributed products business and significantly decreasing our global footprint outside of the United States to less than a dozen countries or territories. Management currently expects that the strategic realignment will be completed in 2023 and estimates that the total costs incurred may be up to $170 million for associated employee severance and benefits, losses on disposal of long-lived assets, and other restructuring costs including the write-off of prepaid assets related to the exit of certain product offerings, professional service fees and contract exit costs. Actual costs may be higher than we expect. We may not realize, in full or in part, the anticipated benefits, savings and improvements in our cost structure from our realignment efforts due to unforeseen difficulties, delays or unexpected costs. If we are unable to realize the expected operational efficiencies and cost savings from the restructuring, our operating results and financial condition would be adversely affected. For example, our divestiture activities may divert management's attention from our core business operations, result in significant write-offs and other charges, and have an adverse effect on existing relationships with partners, customers, patients and third-party payers. We have also terminated early, changed the scope of, or may not be able to perform under certain contracts as a result of our realignment efforts, and we could incur significant liability if we do not successfully negotiate wind-down provisions or new terms. For example, we have informed certain contractual counterparties that we will not be able to perform under our companion diagnostic development agreements. Any of these or other events could adversely affect our financial condition and results of operations. In addition, we may not be able to retain qualified personnel, which may negatively affect our infrastructure and operations or result in a loss of employees and reduced productivity among remaining employees. For example, our turnaround times in returning test results increased recently. Further, the realignment may yield unintended consequences, such as attrition beyond our intended workforce reduction, reduced employee morale, loss of customers or partners, and other adverse effects on our business.

If our management is unable to successfully manage this transition and realignment activities, our expenses may be more than expected and may vary significant from period to period and we may be unable to implement our business strategy. As a result, our future financial performance, operations, and prospects would be negatively affected.

***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. In July 2022, we initiated a strategic realignment of our operations and began implementing cost reduction programs that will ultimately reduce our workforce by approximately 1,000 employees. This reduction in workforce has and will continue to result in the loss of institutional knowledge and expertise and the reallocation of and combination of certain roles and responsibilities across the

organization, all of which could adversely affect our operations. Further, the realignment has and may continue to yield unintended consequences, such as attrition beyond our intended workforce reduction and reduced employee morale. 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 the value of our common stock declines significantly, and remains depressed, as it has in the recent past, or if we do not have enough shares authorized to grant equity awards to new and existing employees, we may not be able to recruit and retain qualified 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 and 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 and evolves, 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.

***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, and cost-effective, and/or whether the patient 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 germline tests from most of the large commercial third-party payers in the United States, and the Centers for Medicare & 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.

***We need to scale our infrastructure in advance of demand for our tests and other services, and our failure to generate sufficient demand for our tests and other services 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 develop new services, 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 infrastructure growth will be in advance of demand for our tests and other services. Many of our current and future expense levels are fixed. Because the timing and amount of revenue from our services 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 services 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.

***The global macroeconomic environment could negatively impact our business, our financial position and our results of operations.***

Adverse macroeconomic developments, including inflation, slowing growth, rising interest rates, or recession, may adversely affect our business and financial condition. These developments have caused, and could in the future cause, disruptions and volatility in global financial markets and increased rates of default and bankruptcy, and negatively affect business and consumer spending. Adverse economic conditions have and may continue to increase the costs of operating our business, including vendor, supplier and workforce expenses, and may limit our access to capital or may significantly increase our cost of capital. Management continues to evaluate the impact of macroeconomic events, including inflation, on our business and our future plans and intends to take appropriate measures to help alleviate their impact, but there can be no assurance that these efforts will be successful. A weak or declining economy also could strain our suppliers, possibly resulting in supply disruption, or cause our customers to delay making payments for our services. A severe or prolonged economic downturn, such as the global financial crisis, could also reduce our ability to raise additional capital when needed on acceptable terms, if at all. Presently, we have customers who have been adversely affected by Russia's invasion of Ukraine, and we have experienced some disruption in our engineering productivity as we have sought to assist contractors in both Ukraine and Russia who have been dislocated or who have chosen to flee Russia. Likewise, the capital and credit markets have been and may continue to be adversely affected by the invasion, the possibility of a wider European or global conflict, and global sanctions imposed in response to the invasion. We cannot predict the future trajectory of these risks, including how the macroeconomic environment will evolve or how it will continue to impact us.

Specifically, difficult macroeconomic conditions, such as cost inflation, decreases in per capita income and level of disposable income, increased and prolonged unemployment or a decline in consumer confidence as a result of COVID-19 or otherwise, 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 to negatively affect our overall financial performance.

***Adverse developments affecting the financial services industry could adversely affect our current and projected business operations and our financial condition and results of operations.***

Adverse developments that affect financial institutions have in the past and may in the future lead to bank failures and market-wide liquidity problems. For example, Silicon Valley Bank (“SVB”), Signature Bank and Silvergate Capital Corp. were each placed into receivership in March 2023. In addition, on May 1, 2023, the Federal Deposit Insurance Corporation (“FDIC”) seized First Republic Bank and sold its assets to JPMorgan Chase & Co. Widespread demands for customer withdrawals or other liquidity demands may exceed other banks' access to cash and similarly be placed into receivership or sold. Additionally, it is uncertain whether the U.S. Department of Treasury, FDIC and Federal Reserve Board will provide access to uninsured funds in the future in the event of the closure of other banks or financial institutions, or that they would do so in a timely fashion.

While we have not experienced any material impact to our liquidity or to our current and projected business operations, financial condition or results of operations as a result of these matters, uncertainty remains over liquidity concerns in the broader financial services industry, and our business, our business partners or industry as a whole may be adversely impacted in ways that we cannot predict at this time.

Although we assess our banking relationships as we believe necessary or appropriate, our access to cash in amounts adequate to finance or capitalize our current and projected future business operations could be significantly impaired by factors that affect the financial institutions with which we have banking relationships. These factors could include, among others, events such as liquidity constraints or failures, the ability to perform obligations

under various types of financial, credit or liquidity agreements or arrangements, disruptions or instability in the financial services industry or financial markets, or concerns or negative expectations about the prospects for companies in the financial services industry. These factors could also include factors involving financial markets or the financial services industry generally. The results of events or concerns that involve one or more of these factors could include a variety of material and adverse impacts on our current and projected business operations and our financial condition and results of operations. These could include, but may not be limited to, delayed access to deposits or other financial assets or the uninsured loss of deposits or other financial assets; or termination of cash management arrangements and/or delays in accessing or actual loss of funds subject to cash management arrangements.

In addition, widespread investor concerns regarding the U.S. or international financial systems could result in less favorable commercial financing terms, including higher interest rates or costs and tighter financial and operating covenants, or systemic limitations on access to credit and liquidity sources, thereby making it more difficult for us to acquire financing on acceptable terms or at all. Any decline in available funding or access to our cash and liquidity resources could, among other risks, adversely impact our ability to meet our operating expenses, financial obligations or fulfill our other obligations, result in breaches of our financial and/or contractual obligations or result in violations of federal or state wage and hour laws. Any of these impacts, or any other impacts resulting from the factors described above or other related or similar factors not described above, could have material adverse impacts on our liquidity and our current and/or projected business operations and financial condition and results of operations.

***We maintain our cash at financial institutions, often in balances that exceed federally insured limits.***

We maintain the majority of our cash and cash equivalents in accounts at banking institutions in the United States that we believe are of high quality. Cash held in these accounts often exceed the FDIC insurance limits. If such banking institutions were to fail, we could lose all or a portion of amounts held in excess of such insurance limitations. As noted above, the FDIC recently took control of SVB, Signature Bank, Silvergate Capital Corp and First Republic Bank. While we did have an account at SVB, our deposits were not affected as a result of such change. In the event of failure of any of the financial institutions where we maintain our cash and cash equivalents, there can be no assurance that we would be able to access uninsured funds in a timely manner or at all. Any inability to access or delay in accessing these funds could adversely affect our business and financial position.

***We hold a significant amount of marketable securities in U.S. treasury notes and U.S. government agency securities.***

At March 31, 2023 and December 31, 2022, we had $171.2 million and $267.5 million, respectively, of cash, cash equivalents, and restricted cash and marketable securities of $217.5 million and $289.6 million, respectively. Our marketable securities are held primarily in the form of U.S. treasury notes and U.S. government agency securities. The current statutory limit on U.S. debt, commonly known as the debt ceiling, of $31.4 trillion was reached in January, requiring the Treasury Department to take accounting measures to continue normally financing U.S. government obligations while avoiding exceeding the debt ceiling. It is expected, however, the U.S. government will exhaust these measures by June 2023. If the debt ceiling is not raised, the U.S. government may not be able to fulfill its funding obligations and there could be significant disruption to all discretionary programs and wider financial and economic repercussions. In addition, the value of our marketable securities could decline.

***We face risks related to health epidemics, including the ongoing 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 COVID-19 pandemic. Global health concerns relating to COVID-19 have negatively affected the macroeconomic environment, and the pandemic has significantly increased economic volatility and uncertainty. As discussed in our prior and current Form 10-K and 10-Q filings, our operations have been and will continue to be impacted by the COVID-19 pandemic and its related economic challenges. Even after COVID-19 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.

There are no comparable recent events which may provide guidance as to the effect of the spread of COVID-19, and, as a result, the ultimate impact of COVID-19 or a similar health epidemic is highly uncertain and subject to change.

***We face intense competition, which is likely to intensify further as existing competitors devote additional resources to, and new participants enter, the markets in which we operate. 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 genetics applied to healthcare, such as Ambry Genetics Corporation, a subsidiary of Realm IDx.; Athena Diagnostics, Inc. and Blueprint Genetics, subsidiaries of Quest Diagnostics Incorporated ("Quest Diagnostics"); Baylor-Miraca Genetics Laboratories LLC; Caris Life Sciences, Inc.; Centogene AG; Color Health, Inc.; Connective Tissue Gene Test LLC, a subsidiary of Health Network Laboratories, L.P.; Cooper Surgical, Inc.; Emory Genetics Laboratory, a subsidiary of Eurofins Scientific; Foundation Medicine, Inc., a subsidiary of Roche Holding AG; Fulgent Genetics, Inc.; Guardant Health, Inc.; Integrated Genetics, Sequenom Inc., Correlagen Diagnostics, Inc., and MNG Laboratories, subsidiaries of Laboratory Corporation of America Holdings ("Labcorp"); Myriad Genetics, Inc.; Natera, Inc. ("Natera"); Perkin-Elmer, Inc.; and Sema4 Genomics; as well as other commercial and academic laboratories;
- a few large, established general testing companies with large market share and significant channel power, such as Labcorp and Quest Diagnostics;
- 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. ("Illumina"), 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 also face competition as a result of our 2021 acquisition of Ciitizen Corporation ("Ciitizen"). Ciitizen competes with companies in the patient data platform business, including, among others, PicnicHealth, All Stripes Research Inc., Seqster PDM, Inc., Apple Inc. ("Apple"), Flatiron Health, Inc.

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 the past, our competitors have been successful in recruiting our employees and may continue to recruit qualified employees from us. 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. Some of our competitors have obtained approval or clearance for certain of their tests from the 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.

***The market for patient data software is competitive, and our business will be adversely affected if we are unable to successfully compete.***

The market for patient data software is competitive. Other than product innovation and access to healthcare data, there are no substantial barriers to entry in this market, and established or new entities may enter this market in the future. While software internally developed by enterprises represents indirect competition, we also compete directly with packaged application software vendors. In addition, we face actual or potential competition from larger companies such as Apple, and similar companies that may attempt to sell customer engagement software to their installed base.

We believe competition will continue to be substantial as current competitors increase the sophistication of their offerings and as new participants enter the market. Many of our current and potential competitors have longer operating histories, larger customer bases, broader brand recognition, and significantly greater financial, marketing and other resources. With more established and better-financed competitors, these companies may be able to undertake more extensive marketing campaigns, adopt more aggressive pricing policies, and make more attractive offers to businesses to induce them to use their products or services. If we are unable to compete successfully, our business will be adversely affected.

***Security breaches, privacy issues, loss of data and other incidents could compromise sensitive or personal 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, genetic 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 systems. We also communicate PHI and other sensitive patient data through our various customer tools and platforms. In addition to storing and transmitting sensitive data that is subject to multiple 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 to our business and operations or exposure to security vulnerabilities. These types of problems may be caused by a variety of factors, including infrastructure changes, intentional or accidental human actions or omissions, software errors, malware, viruses, security attacks, ransomware fraud, spikes in customer usage and denial of service issues. There continues to be a significant level of ransomware and cyber security attacks related to the ongoing conflict between Russia and Ukraine, which could result in substantial harm to internal systems necessary for running our critical operations and revenue generating services.

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, including a formal, dedicated enterprise security program, to protect sensitive information from various compromises (including unauthorized access, disclosure, or modification or lack of availability), our information technology and infrastructure may be vulnerable to attacks by hackers or viruses or breached due to employee error, malfeasance or other disruptions. For example, we have been subject to phishing incidents in the past, and we may experience additional incidents in the future. Any such breach or interruption could compromise our networks, and the information stored therein could be accessed by unauthorized parties, altered, publicly disclosed, lost or stolen.

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.

In addition to data security risks, we face privacy risks. Should we actually violate, or be perceived to have violated, any privacy commitments we make to patients or consumers, we could be subject to a complaint from an affected individual or interested privacy regulator, such as the U.S. Department of Health and Human Services (HHS) Office for Civil Rights (OCR), the FTC, a state Attorney General, an EU Member State Data Protection Authority, or a data protection authority in another international jurisdiction. This risk is heightened given the sensitivity of the data we collect.

Any security compromise that causes an apparent privacy violation could also result in legal claims or proceedings and liability and penalties under federal, state, foreign, or multinational laws that regulate the privacy, security, or breach of personal information, such as but not limited to HIPAA, HITECH, the FTC Act, state UDAP data security and data breach notification laws, the GDPR and the UK Data Protection Act of 2018.

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 GDPR took effect in May 2018. The GDPR applies to any entity established in the EU as well as extraterritorially to any entity outside the EU that offers goods or services to, or monitors the behavior of, individuals who are located in the EU. Among other requirements, the GDPR imposes strict rules on controllers and processors of personal data, including enhanced protections for “special categories” of personal data, which includes sensitive information such as health and genetic information of data subjects. Maximum penalties for violations of the GDPR are capped at 20.0 million euros or 4% of an organization’s annual global revenue, whichever is greater.

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, in June 2018, California adopted the California Consumer Privacy Act of 2018, or the CCPA. The CCPA, is a comprehensive consumer privacy law that took effect in January 2020 and was further amended as of January 1, 2023. The CCPA regulates how certain for-profit businesses that meet one or more CCPA applicability thresholds collect, use, and disclose the personal information of natural persons who reside in California. The CCPA does not apply to personal information that is PHI under HIPAA. The CCPA also does not apply to a HIPAA-regulated entity to the extent that the entity maintains patient information in the same manner as PHI. In addition, de-identified data as defined under HIPAA is also exempt from the CCPA. Accordingly, we do not have CCPA compliance obligations with respect to most genetic testing and patient information we collect and process. However, we are required to comply with the CCPA insofar as we collect other categories of California consumers’ personal information.

Several other states in the United States have either recently enacted or are currently considering similar consumer data privacy laws, which could impact our operations if enacted. Some observers have noted that the CCPA could mark the beginning of a trend toward more stringent privacy legislation in the United States, which could increase our potential liability and adversely affect our business, results of operations, and financial condition.

It is possible the GDPR, CCPA and other emerging United States and international 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 laws and regulations may differ from country to country and state to state, and our obligations under these laws and regulations vary based on the nature of our activities in the particular jurisdiction, such as whether we collect samples from individuals in the local jurisdiction, perform testing in the local jurisdiction, or process personal information regarding employees or other individuals in the local jurisdiction. 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 data security requirements in all of the jurisdictions in which we do business. Failure to comply with privacy and data security requirements could result in a variety of consequences, including civil or criminal penalties, litigation, or damage to our reputation, any of which could have a material adverse effect on our business.

***If we are not able to continue to generate substantial demand for 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. 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 can be 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 may not be successful in increasing demand for our tests through our direct channel, in which we facilitate the ordering of our genetic tests by consumers through an online network of physicians.

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.

We have devoted a portion of our resources to research and development activities related to our Personalized Cancer Monitoring, or PCM, service for cancer monitoring. The demand for this service is unproven, and we may not be successful in achieving market awareness and demand for these services through our sales and marketing operations.

***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 has led and may 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 and pharmacogenetic testing markets expose 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 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 may 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.

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 intangible assets has and may in the future have a material adverse effect on our operating results and financial condition.***

We record intangible assets at fair value upon the acquisition of a business. 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 our reporting unit has and may in the future result in an impairment of intangible assets and, in turn, a charge to net income.

***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, 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 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 online 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.

***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 patient data platform, 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.

***If our laboratories or other facilities 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, California, in Iselin, New Jersey, and in Seattle, Washington. We also plan to open a new laboratory and production facility in Morrisville, North Carolina. 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 or inaccessible due to natural or man-made disasters, including earthquakes, hurricanes, 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 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. If a natural disaster were to damage one of our facilities significantly or if other events were to cause our operations to fail or be significantly curtailed, we may be unable to provide our services, or develop new services. Although we maintain insurance for damage to our property and the disruption of our business, this insurance may not cover all of our potential losses and may not continue to be available to us on acceptable terms, if at all. The inability to open the planned facility in North Carolina, delays in opening such facility or failure to obtain required permits, licenses, or certifications could result in increased costs and prevent us from realizing the intended benefits of the new facility.

***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.

***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 rights 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.

***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 evaluate 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. Since 2017, we have acquired numerous companies.

With respect to our acquired businesses and any acquisitions we may make in the future, we may not be able to integrate these businesses successfully into our existing business, and we could assume unknown or contingent liabilities. Acquisitions by us have, and may in the future, 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, suppliers or key management following the completion of any acquisitions by us could harm our business. In addition, as part of our strategic realignment, we have and may continue to divest assets acquired in previous acquisitions at substantial discounts to the price we paid, or without realizing the benefits we intended at the time of the acquisition. 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 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.

In connection with certain of our completed acquisitions, we have agreed to pay cash and/or stock consideration that is contingent upon the achievement of specified objectives, such as development objectives, regulatory submissions, regulatory approvals and revenue related to certain products. As of the date of the applicable acquisition, we record a contingent liability representing the estimated fair value of the contingent consideration we expect to pay. On a quarterly basis, we reassess these obligations and, in the event our estimate of the fair value of the contingent consideration changes, we record increases or decreases in the fair value as an adjustment to operating expense, which could have a material impact on our results of operations. In addition, in connection with our strategic realignment, we have recently divested or sublicensed certain product offerings, technologies and assets that we had acquired in prior years.

To finance any acquisitions or investments, we may raise additional funds, which could adversely affect our existing stockholders and our business. 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 stock price. Additional funds may not be available on terms that are favorable to us, or at all.

***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 and outbreaks of disease, including the ongoing COVID-19 pandemic;
- political and economic instability, including wars such as the current conflict in Ukraine, terrorism and political unrest, boycotts, curtailment of trade, government sanctions and other business restrictions;
- inflationary pressures, such as those the global market is currently experiencing, which have and may increase costs for materials, supplies, and services; 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.***

As of March 31, 2023, we have substantial deferred tax assets consisting of federal and state net operating losses and tax credit carryforwards. At December 31, 2022, our total gross deferred tax assets were $795.5 million. Due to our lack of earnings history and uncertainties surrounding our ability to generate future taxable income, our net deferred tax assets have been fully offset by a valuation allowance. 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% stockholders” that exceeds 50 percentage points over a rolling three-year period. Some of our prior acquisitions have resulted in an ownership change, and we may experience ownership changes in the future. 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 our indebtedness**

***The terms of our convertible senior secured notes will require us to meet certain operating and financial covenants and place restrictions on our operating and financial flexibility. If we raise additional capital through debt financing, the terms of any new debt could further restrict our ability to operate our business.***

In February 2023, we issued $305.3 million aggregate principal amount of our 4.50% convertible senior secured notes due 2028, or the convertible senior secured notes. The convertible senior secured notes are secured

by a first priority lien on substantially all of our and our subsidiaries' assets (including our intellectual property) and are guaranteed by our subsidiaries, in each case, excluding certain excluded assets and immaterial subsidiaries.

The indenture governing our convertible senior secured notes restricts our ability to, among other restrictions, pursue certain dispositions, mergers or acquisitions, encumber our intellectual property, incur indebtedness or liens, pay dividends or make other payments in respect of our capital stock, make investments and engage in certain other business transactions. In addition, the indenture contains financial covenants that will require us to maintain revenue in the prior four quarters of not less than $250.0 million and, starting with the quarter ending March 31, 2025, a minimum liquidity of at least 15% of the amount of our secured indebtedness then outstanding. If we fail to comply with these or any of the other covenants under the indenture and are unable to obtain a waiver or amendment, the holders of the convertible senior secured notes may, among other things, declare all of the convertible senior secured notes due and payable and exercise rights with respect to collateral securing those notes, each of which could significantly harm our business, financial condition and prospects and could cause the price of our common stock to decline.

If we raise any additional debt financing, the terms of such additional debt could further restrict our operating and financial flexibility.

***If our stockholders do not approve the conversion of the convertible senior secured notes, we may not have the cash necessary to settle such notes in cash upon conversion.***

Our convertible senior secured notes will be convertible at any time at the option of the holders thereof, provided that the holders are prohibited from converting such notes into shares of common stock in excess of the limitations imposed by the rules of the NYSE prior to such time that we obtain stockholder approval for the issuance of such excess shares of common stock. In the absence of stockholder approval, we will be required, after the grace period specified under the indenture with respect to the convertible senior secured notes, to settle any conversion of the excess shares in cash at the then current fair market value, if the holders elect to convert. If we are unable to obtain the requisite stockholder approval and holders convert the convertible senior secured notes, we may not have sufficient cash to satisfy our obligations to the converting holders.

***We have a large amount of debt, servicing our debt requires a significant amount of cash, we may not have sufficient cash flow from our business to service our debt, and we may need to refinance all or a significant portion of our debt.***

As of March 31, 2023, we had outstanding $44.3 million aggregate principal amount of our convertible senior notes due 2024, or the 2024 notes, $1,150.0 million aggregate principal amount of our existing convertible senior notes due 2028, or the unsecured 2028 notes, and $305.3 million aggregate principal amount of our new convertible senior secured notes due 2028. We refer to the 2024 notes and the unsecured 2028 notes as the unsecured convertible notes, and we refer to the unsecured convertible notes and the convertible senior secured notes collectively as the outstanding convertible notes.

Our substantial leverage could have significant negative consequences for our future operations, including:

- increasing our vulnerability to general adverse economic and industry conditions;
- limiting our ability to obtain additional financial for working capital, acquisitions, research and development expenditures, and general corporate purposes;
- requiring the dedication of a substantial portion of our cash flow or our existing cash to service our indebtedness, thereby reducing the amount of our cash available for other purposes;
- limiting our flexibility in planning for, or reacting to, changes in our business and the industry in which we compete; or
- placing us at a possible competitive disadvantage compared to less leveraged competitors and competitors that have better access to capital resources.

Our ability to make scheduled payments of the principal of, to pay interest on or to refinance our indebtedness depends on our future performance, which is subject to economic, financial, competitive and other factors beyond our control. Our business may not generate cash flow from operations in the future sufficient to service our debt, including paying off the principal when due, and make necessary capital expenditures. The respective conversion prices of our unsecured convertible notes are significantly higher than the prevailing market prices for our common stock, and our stock price would have to increase significantly in order for holders to convert our notes prior to maturity. If we are unable to generate cash flow necessary to service or repay our debt at maturity,

we may be required to adopt one or more alternatives, including, but not limited to, 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, and the terms of any such refinancing may be less favorable to us than the terms of our current indebtedness. 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 repurchase our outstanding convertible notes upon a fundamental change or major transaction, as applicable, and the indenture governing our current senior secured notes contains, and our future debt may contain, limitations on our ability to pay cash to repurchase our outstanding convertible notes and other debt.***

Holders of our outstanding unsecured convertible notes have the right to require us to repurchase all or any portion of their notes upon the occurrence of a fundamental change, as defined in the respective indentures governing our outstanding unsecured convertible notes, 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. The repurchase price for our unsecured 2028 notes will also include unpaid interest on such notes to the maturity date. Similarly, holders of our convertible senior secured notes will have the right to require us to repurchase all or any portion of their notes upon the occurrence of a major transaction, as defined in the indenture governing our convertible senior secured notes, for an amount equal to 100% of the principal amount of the notes to be repurchased, plus accrued and unpaid interest and a make whole amount as set forth in such indenture. The indenture governing our convertible senior secured notes will limit our ability to pay cash to repurchase our unsecured convertible notes, and 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 for repurchase. In addition, our ability to repurchase our outstanding convertible 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 respective indentures governing the notes would constitute a default under the relevant indentures. A default under an indenture or the occurrence of the fundamental change or major transaction itself could also lead to a default under the indentures governing our other convertible notes or any 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 to repay or repurchase our convertible notes.

***The conditional conversion feature of our convertible senior notes due 2024, if triggered, may adversely affect our financial condition and operating results.***

In the event the conditional conversion feature of our convertible senior notes due 2024 is triggered, holders of such 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.

**Risks related to government regulation**

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

We provide many of our tests as laboratory-developed tests, or LDTs. CMS and certain state agencies regulate the performance of LDTs (as authorized by 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 system regulations, premarket clearance or premarket approval, and post-market controls). See Part I, Item 1. of our Annual Report on Form 10-K for the year ended December 31, 2022, under the heading "Regulation—Federal oversight of laboratory developed tests" for a description of applicable federal regulations, which is incorporated by reference herein.

If the FDA ultimately regulates certain LDTs whether via individualized enforcement action, 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.

***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 any disease or impairment of, or the assessment of health of, human beings. CLIA regulations establish specific requirements and 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 are also required to maintain certain in-state and out-of-state laboratory licenses and approvals to conduct testing. For more information about our federal (CLIA) and state laboratory licenses and approvals, please see Part I, Item 1. of our Annual Report on Form 10-K for the year ended December 31, 2022, under the headings "Regulation—Clinical Laboratory Improvement Amendments of 1988, or CLIA" and "Regulation—State laboratory licensure requirements," which are incorporated by reference herein. 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.

In order to eventually market certain of our current or future products and services in any particular foreign jurisdiction, we must establish and comply with numerous and varying regulatory requirements on a jurisdiction-by-jurisdiction basis regarding quality, safety, performance and efficacy. In addition, clinical trials or clinical investigations conducted in one country may not be accepted by regulatory authorities in other countries, and regulatory clearance, authorization or approval in one country does not guarantee regulatory clearance, authorization or approval in any other country. For example, the performance characteristics of certain of our products and services may need to be validated separately in specific ethnic and genetic populations. Approval processes vary among countries and can involve additional product testing and validation and additional administrative review periods.

Seeking foreign regulatory clearance, authorization or approval could result in difficulties and costs for us and our collaborators and require additional preclinical studies, clinical trials or clinical investigations which could be costly and time-consuming. Regulatory requirements and ethical approval obligations can vary widely from country to country and could delay or prevent the introduction of certain of our products and services in those countries. The foreign regulatory clearance, authorization or approval process involves all of the risks and uncertainties associated with FDA clearance, authorization or approval. If we or our collaborators fail to comply with regulatory requirements in international markets or to obtain and maintain required regulatory clearances, authorizations or approvals in international markets, or if those approvals are delayed, our target market will be reduced and our ability to realize the full market potential of our products and services will be unrealized.

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, cancellation of the laboratory's approval to receive Medicare and Medicaid payment for its services, exclusion from some healthcare systems' programs, 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 certifications, 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 and HITECH, which set forth comprehensive federal standards with respect to the privacy and security of protected health information, breach notification requirements, and requirements for the use of certain standardized electronic transactions;
- the GDPR, which imposes strict privacy and security requirements on controllers and processors of personal data, including enhanced protections for "special categories" of personal data, including sensitive information such as health and genetic information of data subjects;
- the CCPA and other, similar state consumer privacy laws, which, among other things, regulate how subject businesses may collect, use, and disclose the personal information of consumers in the regulated state, afford rights to consumers that they may exercise against businesses that collect their information, and require implementation of reasonable security measures to safeguard personal information of consumers;
- 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;
- The Eliminating Kickbacks in Recovery Act of 2018, or 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 21st Century Cures Act information blocking prohibition, which prohibits covered actors from engaging in certain practices that are likely to interfere with the access, exchange, or use of electronic health information;
- the federal Physician Payments Sunshine Act, which requires reporting of certain payments and other transfers of value made by applicable manufacturers, directly or indirectly, to or on behalf of various healthcare professionals (including doctors, physician assistants, and nurse practitioners) and teaching hospitals, and requires reporting of certain ownership and investment interests held by physicians and their immediate family members as well as similar state laws that require reporting of information in addition to what is required under the federal Physician Payments Sunshine Act;
- state laws that limit or prohibit the provision of certain payments and other transfers of value to certain covered healthcare providers;
- 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 operations 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. In October 2021, we received a subpoena from the U.S. Attorney's Office for the District of Massachusetts requesting that we produce certain documents regarding our sponsored testing programs. We have produced documents and information in response to the subpoena and are cooperating fully with the investigation. Although we remain committed to compliance with all applicable laws and regulations, we cannot predict the outcome of this investigation or any other requests or investigations that may arise in the future regarding these or other subject matters. Any action brought against us for violation of the above-referenced 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 significant administrative, civil and criminal penalties, damages, fines, 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 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, and its implementing regulations, clinical laboratories must report to CMS private payer rates beginning in 2017, and then in 2024 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 have "advanced diagnostic laboratory test" status for our tests, but in the event that we obtain 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 2023. Laboratories that fail to timely report the required payment information may be subject to substantial civil money penalties.

See Part I, Item 1. of our Annual Report on Form 10-K for the year ended December 31, 2022, under the heading "Regulation—Reimbursement" for a description of how public and private payers pay for our products and services, which is incorporated by reference herein. Changes in these payments and the methodologies used to determine payment amounts could have a significant impact on our financial condition, results of operations and cash flows.

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. 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 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 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**

***One of our competitors has alleged that our Anchored Multiplex PCR, or AMP, chemistry and products using AMP are infringing on its intellectual property, and we may be required to redesign the technology, obtain a license, cease using the AMP chemistry altogether and/or pay significant damages, among other consequences, any of which would have a material adverse effect on our business as well as our financial condition and results of operations.***

Our AMP chemistry is the foundation of our PCM service. One of our competitors, Natera, Inc., or Natera, has filed complaints against ArcherDX, Invitae and Genosity alleging that our products using AMP chemistry, and the manufacture, use, sale, and offer for sale of such products, infringe certain patents. A description of this

ongoing litigation is provided in Note 7, “Commitments and contingencies” in Notes to Condensed Consolidated Financial Statements in Part I, Item 1 of this Quarterly Report.

If any of our products or our use of AMP chemistry is found to infringe any of Natera's patents, we could be required to redesign our technology or obtain a license from Natera to continue developing, manufacturing, marketing, selling and commercializing AMP and related products. However, we may not be successful in the redesign of its technology or able to obtain any such license on commercially reasonable terms or at all. Even if we were able to obtain a license, it could be non-exclusive, thereby giving Natera and other third parties the right to use the same technologies licensed to us, and Natera could require us to make substantial licensing, royalty and other payments. We also could be forced, including by court order, to permanently cease developing, manufacturing, marketing and commercializing our products that are found to be infringing. In addition, we could be found liable for significant monetary damages, including treble damages and attorneys’ fees, if we are found to have willfully infringed Natera's asserted patents. Even if we were ultimately to prevail, litigation with Natera could require us to divert substantial financial and management resources that we would otherwise be able to devote to our business.

We cannot reasonably estimate the final outcome, including any potential liability or any range of potential future charges associated with these litigations. However, any finding of infringement by us of Natera's asserted patents could have a material adverse effect on our business, as well as our financial condition and results of operations.

***Litigation or other proceedings or third-party claims of intellectual property infringement or misappropriation will 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. For example, as discussed in the preceding risk factor, we are currently engaged in litigation with a competitor of ArcherDX alleging infringement. 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 U.S. 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, on August 2, 2022, Senator Thom Tillis (R-NC) introduced a bill entitled The Patent Eligibility Restoration Act of 2022 that would overrule current U.S. Supreme Court precedent concerning the scope of patentable subject matter. If the proposed bill were to be 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.

As an example, the complexity and uncertainty of European patent laws have increased in recent years. In Europe, a new unitary patent system will likely be introduced by the end of 2023, which would significantly impact European patents, including those granted before the introduction of such a system. Under the unitary patent system, European applications will soon have the option, upon grant of a patent, of becoming a Unitary Patent which will be subject to the jurisdiction of the Unitary Patent Court (UPC). As the UPC is a new court system, there is no precedent for the court, increasing the uncertainty of any litigation. Patents granted before the implementation of the UPC will have the option of opting out of the jurisdiction of the UPC and remaining as national patents in the UPC countries. Patents that remain under the jurisdiction of the UPC will be potentially vulnerable to a single UPC-based revocation challenge that, if successful, could invalidate the patent in all countries who are signatories to the UPC. We cannot predict with certainty the long-term effects of any potential changes.

***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 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. As we acquire companies, we will need to establish adequate controls and integrate them into our internal control system. 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. 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.

**General risk factors**

***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;
- effects of our strategic realignment and workforce reduction and our ability to achieve the intended benefits of these activities;
- costs associated with our strategic realignment;
- 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 substantial leverage and market perceptions regarding the same;
- the level of short interest in our stock, and the effect of short sellers on the price of our stock;
- 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. The closing price of our common stock on the NYSE ranged from $1.20 to $8.63 between May 2, 2022 through May 1, 2023. Broad market and industry factors, including the COVID-19 pandemic, as well as general economic, political and geopolitical, and market conditions such as recessions, wars such as the current conflict in Ukraine, elections, interest rate changes, or cost inflation, 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.

***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. In addition, the terms of our credit agreement restrict our ability to pay dividends. 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 chair 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.

Section 27 of the Securities Exchange Act of 1934, or Exchange Act, creates exclusive federal jurisdiction over all suits brought to enforce any duty or liability created by the Exchange Act or the rules and regulations thereunder. As a result, the exclusive forum provision in our certificate of incorporation will not apply to suits brought to enforce any duty or liability created by the Exchange Act or any other claim for which the federal courts have exclusive jurisdiction. Section 22 of the Securities Act of 1933, or Securities Act, creates concurrent jurisdiction for federal and state courts over all suits brought to enforce any duty or liability created by the Securities Act or the rules and regulations thereunder. As a result, the exclusive forum provision in our certificate of incorporation will not apply to suits brought to enforce any duty or liability created by the Securities Act or any other claim for which the federal and state courts have concurrent jurisdiction.

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.

***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. As of March 31, 2023, we had outstanding 260.7 million shares of our common stock, options to purchase 2.3 million shares of our common stock (of which 1.2 million were exercisable as of that date) and outstanding restricted stock units, or RSUs, representing 11.0 million shares of our common stock (which includes an estimated number of RSUs, subject to certain employees' continued service with us, or time-based RSUs, and RSUs that are performance based RSUs, or PRSUs, granted in connection with an acquisition). The foregoing does not include 0.8 million shares of common stock that may be issuable in connection with indemnification hold-backs and contingent consideration related to our acquisitions, shares that may be issuable in the future in connection with the convertible senior notes, or shares issuable pursuant to our May 2021 sales agreement with Cowen and Company, LLC under which we may offer and sell from time to time at our sole discretion shares of our common stock in an aggregate amount not to exceed $400 million. In addition, as of March 31, 2023, 15.8 million and 4.6 million shares of common stock are available for future issuance under our 2015 Stock Incentive Plan and Employee Stock Purchase Plan, respectively. 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.

**ITEM 6. Exhibits.**

| Exhibit Number | Description | Incorporated by Reference | | | Filed Herein |
|---|---|---|---|---|---|
| | | Form | Exhibit | Filing Date | |
| 2.1@ | Agreement and Plan of Merger and Plan of Reorganization, dated as of June 21, 2020, by and among Invitae Corporation, Apollo Merger Sub A Inc., Apollo Merger Sub B LLC, ArcherDX, Inc. and Kyle Lefkoff, solely in his capacity as holders' representative. | 8-K | 2.1 | 6/24/2020 | |
| 3.1 | Amended and Restated Certificate of Incorporation of Invitae Corporation, as amended by the Certificate of Amendment to the Amended and Restated Certificate of Incorporation, dated June 8, 2022. | | | | X |
| 4.1 | Form of Warrant to Purchase Shares of Common Stock of Invitae Corporation. | 8-K | 4.2 | 3/1/2023 | |
| 4.2 | Indenture, dated as of March 7, 2023, between Invitae Corporation, the guarantor parties thereto and U.S. Bank Trust Company, National Association, as trustee and collateral agent. | 8-K | 4.1 | 3/8/2023 | |
| 4.3 | Series A Global Note representing the Series A 4.50% Convertible Senior Secured Notes due 2028, dated as of March 7, 2023, between Invitae Corporation and U.S. Bank Trust Company, National Association, as trustee. | 8-K | 4.2 | 3/8/2023 | |
| 4.4 | Series B Global Note representing the Series B 4.50% Convertible Senior Secured Notes due 2028, dated as of March 7, 2023, between Invitae Corporation and U.S. Bank Trust Company, National Association, as trustee. | 8-K | 4.3 | 3/8/2023 | |
| 4.5 | Registration Rights Agreement, dated as of March 7, 2023, between Invitae Corporation and the investor party thereto. | 8-K | 10.1 | 3/8/2023 | |
| 10.1 | Form of Purchase and Exchange Agreement. | 8-K | 10.1 | 3/1/2023 | |
| 10.2# | Invitae Corporation 2015 Stock Incentive Plan, as amended and restated as of April 3, 2023. | | | | X |
| 31.1 | Principal Executive Officer's Certification Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002. | | | | X |
| 31.2 | Principal Financial Officer's Certification Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002. | | | | X |
| 32.1* | Principal Executive Officer's Certification Pursuant to 18 U.S.C. § 1350 (Section 906 of Sarbanes-Oxley Act of 2002). | | | | X |
| 32.2* | Principal Financial Officer's Certification Pursuant to 18 U.S.C. § 1350 (Section 906 of Sarbanes-Oxley Act of 2002). | | | | X |
| 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. | | | | X |
| 101.SCH | Inline XBRL Taxonomy Extension Schema | | | | X |
| 101.CAL | Inline XBRL Taxonomy Extension Calculation Linkbase | | | | X |
| 101.DEF | Inline XBRL Taxonomy Extension Definition Linkbase | | | | X |
| 101.LAB | Inline XBRL Taxonomy Extension Label Linkbase | | | | X |
| 101.PRE | Inline XBRL Taxonomy Extension Presentation Linkbase | | | | X |
| 104 | Cover Page Interactive Data File (the cover page XBRL tags are embedded within the Inline XBRL document). | | | | X |

# Indicates management contract or compensatory plan or arrangement.

@ The schedules and exhibits to this agreement have been omitted pursuant to Item 601(a)(5) of Regulation S-K. A copy of any omitted schedule and/or exhibit will be furnished to the SEC upon request

* 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 Quarterly Report on 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/ Kenneth D. Knight
Kenneth D. Knight
Chief Executive Officer
*Principal Executive Officer*

By: /s/ Yafei (Roxi) Wen
Yafei (Roxi) Wen
Chief Financial Officer
*Principal Financial Officer*

Date: May 9, 2023

**Exhibit 3.1**

**AMENDED AND RESTATED**
**CERTIFICATE OF INCORPORATION**
**OF**
**INVITAE CORPORATION**

Invitae Corporation, a corporation organized and existing under the laws of the State of Delaware, hereby certifies as follows:

**FIRST**: The name of the corporation is Invitae Corporation

**SECOND**: The original Certificate of Incorporation of the corporation was filed with the Secretary of State of the State of Delaware on January 13, 2010, under its former name "Locus Development, Inc."

**THIRD**: The Certificate of Incorporation of the corporation was most recently amended and restated pursuant to an Amended and Restated Certificate of Incorporation filed with the Secretary of State of the State of Delaware on October 7, 2014, and is hereby further amended and restated pursuant to Sections 242 and 245 of the General Corporation Law of the State of Delaware.

**FOURTH**: The Certificate of Incorporation of the corporation shall be amended and restated to read in full as follows:

ARTICLE I

The name of the Corporation is Invitae Corporation (the ***"Corporation"***).

ARTICLE II

The address of the registered office of the Corporation in the State of Delaware is 1209 Orange Street, Wilmington, County of New Castle, Delaware 19801. The name of its registered agent at such address is The Corporation Trust Company.

ARTICLE III

The purpose of the Corporation is to engage in any lawful act or activity for which a corporation may be organized under the Delaware General Corporation Law (the ***"DGCL"***).

ARTICLE IV

A. Classes of Stock. The total number of shares of all classes of capital stock that the Corporation shall have authority to issue is Four Hundred Twenty Million (420,000,000), of which Four Hundred Million (400,000,000) shares shall be Common Stock, $0.0001 par value per share (the "***Common Stock***"), and of which Twenty Million (20,000,000) shares shall be Preferred Stock, $0.0001 par value per share (the "***Preferred Stock***"). The number of authorized shares of Common Stock or Preferred Stock may be increased or decreased (but not below the number of shares thereof then outstanding) by the affirmative vote of the holders of a majority of the then outstanding shares of Common Stock, without a vote of the holders of the Preferred Stock, or of any series thereof, unless a vote of any such Preferred Stock holders is required pursuant to the provisions established by the Board of Directors of the Corporation (the "***Board of Directors***") in the resolution or resolutions providing for the issue of such Preferred Stock, and if such holders of such Preferred Stock are so entitled to vote thereon, then, except as may

otherwise be set forth in the certificate of incorporation of the Corporation, the only stockholder approval required shall be the affirmative vote of a majority of the voting power of the Common Stock and the Preferred Stock so entitled to vote, voting together as a single class.

B. Preferred Stock. The Preferred Stock may be issued from time to time in one or more series, as determined by the Board of Directors. The Board of Directors is expressly authorized to provide for the issue, in one or more series, of all or any of the remaining shares of Preferred Stock and, in the resolution or resolutions providing for such issue, to establish for each such series the number of its shares, the voting powers, full or limited, of the shares of such series, or that such shares shall have no voting powers, and the designations, preferences and relative, participating, optional or other special rights of the shares of such series, and the qualifications, limitations or restrictions thereof. The Board of Directors is also expressly authorized (unless forbidden in the resolution or resolutions providing for such issue) to increase or decrease (but not below the number of shares of such series then outstanding) the number of shares of any series subsequent to the issuance of shares of that series. In case the number of shares of any such series shall be so decreased, the shares constituting such decrease shall resume the status that they had prior to the adoption of the resolution originally fixing the number of shares of such series.

C. Common Stock.

1. Relative Rights of Preferred Stock and Common Stock. All preferences, voting powers, relative, participating, optional or other special rights and privileges, and qualifications, limitations, or restrictions of the Common Stock are expressly made subject and subordinate to those that may be fixed with respect to any shares of the Preferred Stock.

2. Voting Rights. Except as otherwise required by law or the certificate of incorporation of the Corporation, each holder of Common Stock shall have one vote in respect of each share of stock held by such holder of record on the books of the Corporation for the election of directors and on all matters submitted to a vote of stockholders of the Corporation.

3. Dividends. Subject to the preferential rights of the Preferred Stock, the holders of shares of Common Stock shall be entitled to receive, when, as and if declared by the Board of Directors, out of the assets of the Corporation which are by law available therefor, dividends payable either in cash, in property or in shares of capital stock.

4. Dissolution, Liquidation or Winding Up. In the event of any dissolution, liquidation or winding up of the affairs of the Corporation, after distribution in full of the preferential amounts, if any, to be distributed to the holders of shares of the Preferred Stock, holders of Common Stock shall be entitled, unless otherwise provided by law or the certificate of incorporation of the Corporation, to receive all of the remaining assets of the Corporation of whatever kind available for distribution to stockholders ratably in proportion to the number of shares of Common Stock held by them respectively.

## ARTICLE V

In furtherance and not in limitation of the powers conferred by the laws of the State of Delaware:

A. The Board of Directors is expressly authorized to adopt, amend or repeal the bylaws of the Corporation, without any action on the part of the stockholders, by the vote of at least a majority of the directors of the Corporation then in office. In addition to any vote of the holders of any class or series of stock of the Corporation required by law or the certificate of incorporation of the Corporation, the bylaws may also be adopted, amended or repealed by the

affirmative vote of the holders of at least sixty-six and two-thirds percent (66-2/3%) of the voting power of the shares of the capital stock of the Corporation entitled to vote in the election of directors, voting as one class; provided, however, that the affirmative vote of the holders representing only a majority of the voting power of the shares of the capital stock of the Corporation entitled to vote in the election of directors, voting as one class, shall be required if such adoption, amendment or repeal of the bylaws has been previously approved by the affirmative vote of at least two-thirds (2/3) of the directors of the Corporation then in office.

B. Elections of directors need not be by written ballot unless the bylaws of the Corporation shall so provide.

C. The books of the Corporation may be kept at such place within or without the State of Delaware as the bylaws of the Corporation may provide or as may be designated from time to time by the Board of Directors.

ARTICLE VI

A. The business and affairs of the Corporation shall be managed by a Board of Directors. The authorized number of directors of the Corporation shall be fixed in the manner provided in the bylaws of the Corporation. Other than for those directors elected by the holders of any series of Preferred Stock, which shall be as provided for or fixed pursuant to the provisions of Article IV, Paragraph B hereof, each director shall serve until his or her successor shall be duly elected and qualified or until his or her earlier resignation, removal from office, death or incapacity.

B. Subject to the rights of the holders of any series of Preferred Stock then outstanding, newly created directorships resulting from any increase in the authorized number of directors or any vacancies in the Board of Directors resulting from death, resignation, retirement, disqualification, removal from office or other cause shall be filled solely by a majority vote of the directors then in office, although less than a quorum, or by a sole remaining director. If there are no directors in office, then an election of directors may be held in the manner provided by statute. Directors chosen pursuant to any of the foregoing provisions shall hold office until their successors are duly elected and qualified or until their earlier resignation or removal. No decrease in the number of directors constituting the Board of Directors shall shorten the term of any incumbent director. In the event of a vacancy in the Board of Directors, the remaining directors, except as otherwise provided by law, or by the certificate of incorporation or the bylaws of the corporation, may exercise the powers of the full Board of Directors until the vacancy is filled.

ARTICLE VII

A. No action required or permitted to be taken at any annual or special meeting of the stockholders may be taken without a meeting and the power of stockholders to consent in writing, without a meeting, to the taking of any action is specifically denied.

B. Special meetings of the stockholders of the Corporation may be called only by the Chairman of the Board of Directors or the Chief Executive Officer of the Corporation or by a resolution adopted by the affirmative vote of a majority of the Board of Directors, and any power of stockholders to call a special meeting of stockholders is specifically denied.

C. Advance notice of stockholder nominations for the election of directors and of business to be brought by stockholders before any meeting of the stockholders of the Corporation shall be given in the manner and to the extent provided in the bylaws of the Corporation.

D. Unless the Corporation consents 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 (i) any derivative action or proceeding brought on behalf of the Corporation, (ii) any action asserting a claim of breach of a fiduciary duty owed by any director, officer or other employee of the Corporation to the Corporation or the Corporation's stockholders, (iii) any action asserting a claim arising pursuant to any provision of the DGCL, or (iv) any action asserting a claim governed by the internal affairs doctrine. Any person or entity purchasing or otherwise acquiring any interest in shares of capital stock of the Corporation shall be deemed to have notice of and consented to the provisions of this Article VII, Paragraph D.

ARTICLE VIII

A. Limitation on Liability. To the fullest extent permitted by the DGCL, as the same exists or as may hereafter be amended (including, but not limited to Section 102(b)(7) of the DGCL), a director of the Corporation shall not be personally liable to the Corporation or its stockholders for monetary damages for breach of fiduciary duty as a director. If the DGCL hereafter is amended to further eliminate or limit the liability of directors, then the liability of a director of the Corporation, in addition to the limitation on personal liability provided herein, shall be limited to the fullest extent permitted by the amended DGCL. Any repeal or modification of this paragraph by the stockholders of the Corporation shall be prospective only, and shall not adversely affect any limitation on the personal liability of a director of the Corporation existing at the time of such repeal or modification.

B. Indemnification. Each person who is or was a director or officer of the Corporation or is or was serving at the request of the Corporation as a director, officer, employee or agent of another corporation or of a partnership, joint venture, trust, employee benefit plan or other enterprise (including the heirs, executors, administrators or estate of such person), shall be indemnified and advanced expenses by the Corporation, in accordance with the bylaws of the Corporation, to the fullest extent authorized by the DGCL, as the same exists or may hereafter be amended (but, in the case of any such amendment, only to the extent that such amendment permits the Corporation to provide broader indemnification rights than said law permitted the Corporation to provide prior to such amendment), or any other applicable laws as presently or hereinafter in effect. The right to indemnification and advancement of expenses hereunder shall not be exclusive of any other right that any person may have or hereafter acquire under any statute, provision of the certificate of incorporation or bylaws of the Corporation, agreement, vote of stockholders or disinterested directors or otherwise.

C. Insurance. The Corporation may, to the fullest extent permitted by law, purchase and maintain insurance on behalf of any person who is or was a director, officer, employee or agent of the Corporation or another corporation, partnership, joint venture, trust, employee benefit plan or other enterprise against any expense, liability or loss incurred by such person in any such capacity or arising out of such person's status as such, whether or not the Corporation would have the power to indemnify such person against such expense, liability or loss under the DGCL.

D. Repeal and Modification. Any repeal or modification of the foregoing provisions of this Article VIII shall not adversely affect any right or protection existing hereunder immediately prior to such repeal or modification.

ARTICLE IX

The affirmative vote of the holders of at least sixty-six and two-thirds percent (66-2/3%) of the voting power of the shares of the capital stock of the Corporation entitled to vote generally in the election of directors, voting together as a single class, shall be required to amend in any respect or repeal this Article IX, Paragraph A of Article V, or Articles VI, VII or VIII.

*[remainder of page intentionally left blank]*

**IN WITNESS WHEREOF**, the corporation has caused this certificate to be signed by its Chief Executive Officer this 18th day of February, 2015.

INVITAE CORPORATION

By /s/ Randal W. Scott

Randal W. Scott, Chief Executive Officer

**CERTIFICATE OF AMENDMENT**
**OF**
**AMENDED AND RESTATED CERTIFICATE OF INCORPORATION**
**OF**
**INVITAE CORPORATION**

Invitae Corporation, a corporation organized and existing under the General Corporation Law of the State of Delaware (the "***Corporation***"), hereby certifies as follows:

1. The original Certificate of Incorporation of the Corporation was filed with the Secretary of State of Delaware on January 13, 2010 under the name Locus Development, Inc. The Corporation most recently filed an Amended and Restated Certificate of Incorporation with the Secretary of State of Delaware on February 18, 2015 under the name Invitae Corporation.

2. This amendment to the Amended and Restated Certificate of Incorporation of the Corporation as set forth below has been duly adopted in accordance with the provisions of Section 242 of the General Corporation Law of the State of Delaware by the stockholders and directors of the Corporation.

3. The first sentence of the first paragraph of ARTICLE IV of the Amended and Restated Certificate of Incorporation of the Corporation as presently in effect is amended and restated to read in its entirety as follows:

> "Classes of Stock. The total number of shares of all classes of capital stock that the Corporation shall have authority to issue is Six Hundred Twenty Million (620,000,000), of which Six Hundred Million (600,000,000) shares shall be Common Stock, $0.0001 par value per share (the "***Common Stock***"), and of which Twenty Million (20,000,000) shares shall be Preferred Stock, $0.0001 par value per share (the "***Preferred Stock***")."

4. All other provisions of the Amended and Restated Certificate of Incorporation of the Corporation remain in full force and effect.

IN WITNESS WHEREOF, the Corporation has caused this Certificate of Amendment of Amended and Restated Certificate of Incorporation to be signed by its duly authorized President and Chief Executive Officer on this 8th day of June, 2022.

INVITAE CORPORATION

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

Sean E. George, Ph.D.

President and Chief Executive Officer

**Exhibit 10.2**

# INVITAE CORPORATION

# 2015 STOCK INCENTIVE PLAN

(As Amended and Restated by the Board of Directors on April 3, 2023)

**Table of Contents**

**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, June 12, 2020, December 7, 2020, March 26, 2021, July 16, 2021, August 31, 2021 and April 3, 2023. 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).

(ab) *"Stock"* shall mean the Common Stock of the Company.

(ac) *"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.

(ad) *"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.

(ae) *"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: (A) 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); and (B) an additional 543,872 Shares are authorized for issuance as Awards under the Plan as a result of the Company's assumption of the 2015 ArcherDX, Inc. Stock Incentive Plan, provided such Awards may not be issued (I) to persons who were Employees, Consultants or Outside Directors of the Company or its Subsidiaries prior to October 2, 2020 (*i.e.*, the date of the Company's acquisition of ArcherDX, Inc.) or (II) following September 2, 2025 (*i.e.*, the end of the original term of the 2015 ArcherDX, Inc. Stock Incentive Plan). 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 in the aggregate (a) 855,000 Shares ("*Share-based Inducement Awards*"), plus (b) $341,225,000, with the specific number of Shares within such

$341,225,000 limit based on (i) the Fair Market Value of a Share 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, (ii) the Fair Market Value of a Share on the date of grant of an Inducement Award, or (iii) any other value of a Share in the applicable agreement setting forth an Inducement Award including but not limited to an asset acquisition agreement, a stock acquisition agreement, a merger agreement, or any similar agreement ("*Value-based Inducement Awards*"). 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 number of Shares forfeited, canceled, held back, reacquired, settled without the issuance of Shares or otherwise terminated (other than by exercise) for Share-based Inducement Awards and based on vesting date Fair Market Value of the Inducement Shares returning to the Plan or other valuation method set forth in the Award Agreement for Value-based Inducement Awards, 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, Kenneth D. Knight, certify that:

1. I have reviewed this quarterly report on Form 10-Q of Invitae Corporation for the period ended March 31, 2023;

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 9, 2023

/s/ Kenneth D. Knight

Kenneth D. Knight
Chief Executive Officer and Director
(Principal Executive Officer)

**Exhibit 31.2**

**PRINCIPAL FINANCIAL OFFICER'S CERTIFICATION PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002**

I, Yafei (Roxi) Wen, certify that:

1. I have reviewed this quarterly report on Form 10-Q of Invitae Corporation for the period ended March 31, 2023;

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 9, 2023

/s/ Yafei (Roxi) Wen

Yafei (Roxi) Wen
Chief Financial Officer
(Principal Financial Officer)

**Exhibit 32.1**

**PRINCIPAL EXECUTIVE OFFICER'S 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, 2023, 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 9, 2023

/s/ Kenneth D. Knight

Kenneth D. Knight
Chief Executive Officer and Director
(Principal Executive Officer)

**Exhibit 32.2**

**PRINCIPAL FINANCIAL OFFICER'S 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, 2023, 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 9, 2023

/s/ Yafei (Roxi) Wen
Yafei (Roxi) Wen
Chief Financial Officer
(Principal Financial Officer)