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

FORM 10-Q

(Mark One)

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

FOR THE QUARTERLY PERIOD ENDED JUNE 30, 2024

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

FOR THE TRANSITION PERIOD FROM TO

Commission file number: 001-38613

Bionano Genomics, Inc.

(Exact name of registrant as specified in its charter)

Delaware	**26-1756290**
(State or Other Jurisdiction of Incorporation or Organization)	(I.R.S. Employer Identification No.)
9540 Towne Centre Drive, Suite 100, San Diego, CA	**92121**
(Address of Principal Executive Offices)	(Zip Code)

(858) 888-7600

(Registrant's Telephone Number, Including Area Code)

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

Title of each class	**Trading Symbol(s)**	**Name of each exchange on which registered**
Common Stock, $0.0001 par value per share	BNGO	The Nasdaq Stock Market, LLC

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 registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐ No ☒

As of August 1, 2024, the registrant had 85,997,130 shares of Common Stock ($0.0001 par value) outstanding.

BIONANO GENOMICS, INC.
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PART I. FINANCIAL INFORMATION

ITEM 1. FINANCIAL STATEMENTS

BIONANO GENOMICS, INC.
Condensed Consolidated Balance Sheets

	(Unaudited) June 30, 2024	December 31, 2023
Assets		
Current assets:		
Cash and cash equivalents	$ 10,425,000	$ 17,948,000
Investments	8,516,000	48,823,000
Accounts receivable, net	6,255,000	9,319,000
Inventory	19,475,000	22,892,000
Prepaid expenses and other current assets	4,889,000	6,019,000
Restricted cash	11,008,000	—
Restricted investments	—	35,117,000
Total current assets	60,568,000	140,118,000
Restricted cash, net of current portion	400,000	400,000
Property and equipment, net	24,863,000	23,345,000
Operating lease right-of-use assets	4,221,000	5,633,000
Finance lease right-of-use assets	3,402,000	3,503,000
Intangible assets, net	30,021,000	33,974,000
Other long-term assets	5,889,000	7,431,000
Total assets	$ 129,364,000	$ 214,404,000
Liabilities and stockholders' equity		
Current liabilities:		
Accounts payable	8,734,000	10,384,000
Accrued expenses	5,530,000	8,089,000
Contract liabilities	1,147,000	783,000
Operating lease liability	2,139,000	2,163,000
Finance lease liability	266,000	272,000
Purchase option liability (at fair value)	—	8,534,000
Convertible notes payable (at fair value)	19,359,000	69,803,000
Total current liabilities	37,175,000	100,028,000
Operating lease liability, net of current portion	2,242,000	3,590,000
Finance lease liability, net of current portion	3,564,000	3,585,000
Contingent consideration	5,774,000	10,890,000
Long-term contract liabilities	272,000	154,000
Total liabilities	$ 49,027,000	$ 118,247,000
Commitments and contingencies (Note 7)		
Stockholders' equity:		
Preferred stock, $0.0001 par value; 10,000,000 shares authorized at June 30, 2024 and December 31, 2023; no shares issued and outstanding at June 30, 2024 and December 31, 2023	—	—
Common stock, $0.0001 par value, 400,000,000 shares authorized at June 30, 2024 and December 31, 2023; 70,776,000 and 45,752,000 shares issued and outstanding at June 30, 2024 and December 31, 2023, respectively	7,000	5,000
Additional paid-in capital	709,187,000	677,337,000
Accumulated deficit	(628,854,000)	(581,208,000)
Accumulated other comprehensive income (loss)	(3,000)	23,000
Total stockholders' equity	$ 80,337,000	$ 96,157,000
Total liabilities and stockholders' equity	$ 129,364,000	$ 214,404,000

See accompanying notes to the unaudited condensed consolidated financial statements.

BIONANO GENOMICS, INC.
Condensed Consolidated Statements of Operations
(Unaudited)

	Three Months Ended June 30,		Six Months Ended June 30,	
	2024	2023	2024	2023
Revenue:				
Product revenue	$ 6,510,000	$ 6,609,000	$ 13,338,000	$ 12,056,000
Service and other revenue	1,261,000	2,053,000	3,202,000	4,021,000
Total revenue	7,771,000	8,662,000	16,540,000	16,077,000
Cost of revenue:				
Cost of product revenue	4,703,000	4,752,000	9,607,000	8,610,000
Cost of service and other revenue	483,000	1,602,000	1,525,000	3,090,000
Total cost of revenue	5,186,000	6,354,000	11,132,000	11,700,000
Operating expenses:				
Research and development	6,831,000	14,610,000	16,608,000	28,547,000
Selling, general and administrative	11,557,000	26,936,000	31,092,000	52,913,000
Restructuring costs	1,215,000	—	5,847,000	—
Total operating expenses	19,603,000	41,546,000	53,547,000	81,460,000
Loss from operations	(17,018,000)	(39,238,000)	(48,139,000)	(77,083,000)
Other income (expense):				
Interest income	457,000	689,000	1,500,000	1,392,000
Other income (expense)	363,000	(330,000)	(998,000)	(288,000)
Total other income (expense)	820,000	359,000	502,000	1,104,000
Loss before income taxes	(16,198,000)	(38,879,000)	(47,637,000)	(75,979,000)
Benefit (provision) for income taxes	(26,000)	(33,000)	(9,000)	(59,000)
Net loss	$ (16,224,000)	$ (38,912,000)	$ (47,646,000)	$ (76,038,000)
Net loss per share, basic and diluted	$ (0.24)	$ (1.24)	$ (0.79)	$ (2.46)
Weighted-average common shares outstanding basic and diluted	67,583,000	31,498,000	60,175,000	30,855,000

See accompanying notes to the unaudited condensed consolidated financial statements.

BIONANO GENOMICS, INC.
Condensed Consolidated Statements of Comprehensive Loss
(Unaudited)

	Three Months Ended June 30,		Six Months Ended June 30,	
	2024	2023	2024	2023
Net loss:	$ (16,224,000)	$ (38,912,000)	$ (47,646,000)	$ (76,038,000)
Other comprehensive income (loss):				
Unrealized gain (loss) on investment securities	15,000	365,000	2,000	787,000
Foreign currency translation adjustments	(2,000)	(10,000)	(28,000)	27,000
Other comprehensive income (loss)	$ 13,000	$ 355,000	$ (26,000)	$ 814,000
Total comprehensive loss	$ (16,211,000)	$ (38,557,000)	$ (47,672,000)	$ (75,224,000)

See accompanying notes to the unaudited condensed consolidated financial statements.

BIONANO GENOMICS, INC.
Condensed Consolidated Statements of Stockholders' Equity (Deficit)
(Unaudited)

	Common Stock		Additional Paid-in Capital	Accumulated Deficit	Accumulated Other Comprehensive Loss	Total Stockholders' Equity (Deficit)
	Shares	Amount				
Balance at January 1, 2023	29,718,000	$ 3,000	$ 599,234,000	$ (348,715,000)	$ (1,124,000)	$ 249,398,000
Stock option exercises	4,000	—	23,000	—	—	23,000
Stock-based compensation expense	—	—	3,882,000	—	—	3,882,000
Issue common stock, net of issuance costs	950,000	—	14,848,000	—	—	14,848,000
Issuance of common stock due to the vesting of restricted stock units, net of shares withheld to cover taxes	7,000	—	—	—	—	—
Net loss	—	—	—	(37,124,000)	—	(37,124,000)
Other comprehensive income (loss)	—	—	—	—	459,000	459,000
Balance at March 31, 2023	30,679,000	$ 3,000	$ 617,987,000	$ (385,839,000)	$ (665,000)	$ 231,486,000
Stock option exercises	—	—	1,000	—	—	1,000
Stock-based compensation expense	—	—	3,932,000	—	—	3,932,000
Issue common stock, net of issuance costs	2,552,000	—	17,802,000	—	—	17,802,000
Issuance of common stock due to the vesting of restricted stock units, net of shares withheld to cover taxes	(6,000)	—	—	—	—	—
Issue stock for employee stock purchase plan	15,000	—	92,000	—	—	92,000
Net loss	—	—	—	(38,912,000)	—	(38,912,000)
Other comprehensive income (loss)	—	—	—	—	355,000	355,000
Balance at June 30, 2023	33,240,000	$ 3,000	$ 639,814,000	$ (424,751,000)	$ (310,000)	$ 214,756,000
Balance at January 1, 2024	45,752,000	$ 5,000	$ 677,337,000	$ (581,208,000)	$ 23,000	$ 96,157,000
Stock-based compensation expense	—	—	3,015,000	—	—	3,015,000
Issue common stock, net of issuance costs	11,787,000	1,000	15,059,000	—	—	15,060,000
Net loss	—	—		(31,422,000)	—	(31,422,000)
Other comprehensive income (loss)	—	—			(39,000)	(39,000)
Balance at March 31, 2024	57,539,000	$ 6,000	$ 695,411,000	$ (612,630,000)	$ (16,000)	$ 82,771,000
Stock-based compensation expense	—	—	2,583,000	—	—	2,583,000
Issue common stock, net of issuance costs	11,025,000	1,000	11,181,000	—	—	11,182,000
Issue stock for warrant exercises	2,197,000	—	2,000	—	—	2,000
Issue stock for employee stock purchase plan	15,000	—	10,000	—	—	10,000
Net loss	—	—	—	(16,224,000)	—	(16,224,000)
Other comprehensive income (loss)	—	—	—	—	13,000	13,000
Balance at June 30, 2024	70,776,000	$ 7,000	$ 709,187,000	$ (628,854,000)	$ (3,000)	$ 80,337,000

See accompanying notes to the unaudited condensed consolidated financial statements.

BIONANO GENOMICS, INC.
Condensed Consolidated Statements of Cash Flows
(Unaudited)

	Six Months Ended June 30,	
	2024	2023
Operating activities:		
Net loss	$ (47,646,000)	$ (76,038,000)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization expense	5,995,000	6,487,000
Amortization of financing lease right-of-use asset	102,000	102,000
Amortization (accretion) of interest on securities	(912,000)	(226,000)
Non-cash lease expense	113,000	20,000
Gain on lease modification	(73,000)	—
Net realized loss (gain) on investments	18,000	23,000
Stock-based compensation	5,598,000	7,814,000
Change in fair value of contingent consideration	(5,116,000)	2,218,000
Change in fair value of convertible debentures, convertible notes payable and option liability	(7,084,000)	—
Loss on issuance of convertible debentures	1,890,000	—
Gain on High Trail extinguishment	(3,965,000)	—
Loss on intangible asset impairment	448,000	—
Loss on property and equipment disposal	374,000	—
Cost of leased equipment sold to customer	210,000	88,000
Changes in operating assets and liabilities:		
Accounts receivable	3,064,000	(590,000)
Inventory	(1,073,000)	(7,345,000)
Prepaid expenses and other current assets	1,129,000	1,785,000
Other assets	1,545,000	(587,000)
Accounts payable	(1,648,000)	(791,000)
Accrued expenses and contract liabilities	(2,078,000)	(2,069,000)
Net cash used in operating activities	(49,109,000)	(69,109,000)
Investing Activities:		
Purigen acquisition, return of purchase consideration from escrow	—	96,000
Purchases of property and equipment	(103,000)	(839,000)
Purchase of available for sale securities	(151,585,000)	—
Sale and maturity of available for sale securities	227,905,000	46,879,000
Construction in progress	—	(32,000)
Net cash provided by investing activities	76,217,000	46,104,000
Financing activities:		
Principal payments on financing lease liability	(28,000)	(22,000)
Proceeds from sale of common stock and warrants	27,602,000	33,487,000
Offering expenses on sale of common stock and warrants	(1,362,000)	(837,000)
Proceeds from sale of common stock under employee stock purchase plan	10,000	92,000
Proceeds from warrant and option exercises	2,000	23,000
Proceeds from issuance of convertible debentures	18,000,000	—
Payments on High Trail Notes	(61,001,000)	—
Debt issuance costs on sale of convertible debentures	(1,444,000)	—
Payments of retirement fees for redemption of High Trail Notes	(5,375,000)	—
Net cash (used in)/provided by financing activities	(23,596,000)	32,743,000
Effect of exchange rates on cash, cash equivalents and restricted cash	(27,000)	27,000
Net decrease in cash, cash equivalents and restricted cash	3,485,000	9,765,000
Cash, cash equivalents and restricted cash at beginning of period	18,348,000	5,491,000

Cash, cash equivalents and restricted cash at end of period	$ 21,833,000	$ 15,256,000
Reconciliation of cash, cash equivalents and restricted cash reported within the unaudited condensed consolidated balance sheets to the total amounts reported on the unaudited condensed consolidated statements of cash flows		
Cash and cash equivalents	10,425,000	14,856,000
Restricted cash	11,408,000	400,000
Total cash, cash equivalents and restricted cash at end of period	$ 21,833,000	$ 15,256,000
Supplemental cash flow disclosures:		
Cash paid for interest	$ 9,670,000	$ 149,000
Cash paid for operating lease liabilities	$ 1,340,000	$ 1,291,000
Supplemental disclosure of non-cash investing and financing activities:		
Transfer of instruments and servers from inventory to property and equipment, net	$ 4,490,000	$ 4,615,000
Property and equipment included in accounts payable	$ —	$ 104,000
Construction in progress included in accounts payable	$ —	$ 65,000

See accompanying notes to the unaudited condensed consolidated financial statements.

BIONANO GENOMICS, INC.
NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS
(Unaudited)

1. Organization and Basis of Presentation

Description of Business

Bionano Genomics, Inc. (collectively, with its consolidated subsidiaries, the "Company") is a provider of genome analysis solutions that can enable researchers and clinicians to reveal answers to challenging questions in biology and medicine. The Company offers optical genome mapping ("OGM") solutions for applications across basic, translational and clinical research, and for other applications including bioprocessing. The Company offers a platform-agnostic software solution, which integrates next-generation sequencing, microarray and OGM data designed to provide analysis, visualization, interpretation and reporting of copy number variants, single-nucleotide variants and absence of heterozygosity across the genome in one consolidated view. The Company also offers nucleic acid extraction and purification solutions using proprietary isotachophoresis ("ITP") technology. Through its Lineagen, Inc. (doing business as Bionano Laboratories, "Bionano Laboratories") business, the Company also provides OGM-based diagnostic testing services.

Reverse Stock Split

On August 4, 2023, the Company filed a Certificate of Amendment to its Amended and Restated Certificate of Incorporation with the Secretary of State of the State of Delaware to effect a reverse stock split of all issued and outstanding shares of the Company's common stock at a ratio of 1-for-10. The reverse stock split did not change the par value or the authorized number of shares of the Company's common stock. The accompanying consolidated financial statements and notes to the consolidated financial statements present the retroactive effect of the reverse stock split on the Company's common stock and per share amounts for all periods presented.

Basis of Presentation

The accompanying financial information has been prepared by the Company pursuant to the rules and regulations of the Securities and Exchange Commission (the "SEC") for interim reporting purposes. The condensed consolidated financial statements are unaudited. The unaudited condensed consolidated financial statements reflect, in the opinion of the Company's management, all adjustments, consisting of only normal recurring adjustments, necessary for a fair presentation of financial position, results of operations, changes in equity, and comprehensive loss and cash flows for each period presented in accordance with United States generally accepted accounting principles ("U.S. GAAP"). All intercompany transactions and balances have been eliminated. The operating results presented in these unaudited interim condensed financial statements are not necessarily indicative of the results that may be expected for any future periods. These interim unaudited condensed consolidated financial statements should be read in conjunction with the audited consolidated financial statements and related notes thereto included in the Company's Annual Report on Form 10-K for the year ended December 31, 2023.

Liquidity and Going Concern

The Company has experienced recurring net losses from operations, negative cash flows from operating activities, and accumulated deficit since its inception and expects to continue to incur net losses into the foreseeable future. As of June 30, 2024, the Company had approximately $10.4 million in cash and cash equivalents, $8.5 million in short-term investments and $11.4 million in restricted cash. The amount we are required to hold as restricted cash is equal to the lesser of (a) $11.0 million and (b) the then outstanding principal balance of the Debentures (as defined in Note 5 (Debt) below).

The Company has an accumulated deficit of $628.9 million as of June 30, 2024. During the six months ended June 30, 2024, the Company used $49.1 million cash in operations.

On March 1, 2024, the Company redeemed $27.7 million aggregate principal amount of the convertible notes previously issued to High Trail Special Situations LLC ("High Trail") pursuant to that certain securities purchase agreement in October 2023 (the "High Trail Notes"), at a redemption price of 115% of the outstanding principal (the "Repayment Price") or $31.8 million, and for the period January 1, 2024, through May 1, 2024, redeemed an additional $18.0 million aggregate principal amount of the High Trail Notes at the holders' option at the Repayment Price for an aggregate of $20.7 million. On May 23, 2024, in connection with the Debentures offering discussed below, the Company fully redeemed the outstanding aggregate principal amount of $15.3 million under the High Trail Notes at the Repayment Price for an aggregate of $17.6 million, and the High Trail Notes were cancelled. In addition, the Company paid High Trail aggregate retirement fees of $5.4 million related to the Notes' redemptions. See Note 5 (Debt) for additional information.

On May 24, 2024, the Company issued $20.0 million of Debentures for $18.0 million in gross proceeds and paid debt costs of $1.4 million. Through June 30, 2024, the Company paid $0.2 million in interest and no principal amounts on the Debentures. As of June 30, 2024, the Company may be required to redeem up to $6.0 million of principal and expects to pay an additional $1.4 million in interest on the Debentures in 2024. See Note 5 (Debt) for additional information. Management expects operating

losses and negative cash flows to continue for at least the next year as the Company continues to incur costs related to product development and commercialization efforts. Management has prepared cash flows forecasts which indicate that based on the Company's expected operating losses and negative cash flows, there is substantial doubt about the Company's ability to continue as a going concern within twelve months after the date that the unaudited condensed consolidated financial statements for the six months ended June 30, 2024, are issued. Management's ability to continue as a going concern is dependent upon its ability to raise additional funding. Management's plans to raise additional capital to fulfill its operating and capital requirements for at least 12 months include public or private equity or debt financings. However, the Company may not be able to secure such financing in a timely manner or on favorable terms, if at all.

Furthermore, if the Company issues equity securities to raise additional funds, its existing stockholders may experience dilution, and the new equity securities may have rights, preferences and privileges senior to those of the Company's existing stockholders.

The unaudited condensed consolidated financial statements have been prepared on a going concern basis, which contemplates the realization of assets and settlement of liabilities in the normal course of business, and do not include any adjustments to reflect the outcome of this uncertainty.

Significant Accounting Policies

During the three and six months ended June 30, 2024, there were no material changes to the Company's significant accounting policies as described in the Company's Annual Report on Form 10-K for the year ended December 31, 2023.

Restructuring

The Company's restructuring expense consists primarily of actions taken in May and October 2023 (the "2023 Workforce Reduction") and March 2024 in order to reduce costs and improve operations and manufacturing efficiency. Severance-related costs were accounted for as a one-time termination benefit communicated by period end without an additional service component, so the charge represents the total amount expected to be incurred. As a result of reducing facility costs and discretionary spending unrelated to headcount and combined with the cost savings from the 2023 Workforce Reduction and March 2024, such plans are intended to decrease expenses and maintain a streamlined organization to support its business.

In connection with the Company's restructuring initiatives, the Company entered into a lease termination agreement on February 28, 2024 with the landlord for the facility in Salt Lake City that will result in a one-time termination fee of approximately $0.2 million in the third quarter of 2024. The Company continued to lease the property through June 2024. The Company accounted for the lease amendment as a lease modification and recorded a gain of $0.1 million during the three months ended March 31, 2024.

On March 1, 2024, the Company's board of directors approved a cost savings plan, including a reduction in force, that it expects to reduce its annualized operating expenses. This cost savings plan is incremental to the 2023 Workforce Reduction. As part of the plan, the Company reduced its overall headcount by approximately 120 employees. The Company has substantially completed the reduction in force as of June 30, 2024. In addition, Bionano Laboratories will phase out over time the offering of certain testing services related to neurodevelopmental disorders, including autism spectrum disorders, and other disorders of childhood development. The estimates of costs and expenses that the Company expects to incur in connection with the reduction in force are subject to a number of assumptions and actual results may differ materially. The Company may also incur additional costs not currently contemplated due to events that may occur as a result of, or that are associated with, the reduction in force. See Note 7 (Commitments and Contingencies) for additional information.

Impairment of Long-Lived Assets (including Finite-Lived Intangible Assets)

Long-lived assets are reviewed for impairment if indicators of potential impairment exist. If the Company identifies a change in the circumstances related to its long-lived assets, such as property and equipment and intangible assets (other than goodwill), that indicates the carrying value of any such asset may not be recoverable, the Company will perform an impairment analysis. A long-lived asset (other than goodwill) is not recoverable when the undiscounted cash flows expected to be generated by the asset (or asset group) are less than the asset's carrying amount. Any required impairment loss would be measured as the amount

by which the asset's carrying value exceeds its fair value, and would be recorded as a reduction in the carrying value of the related asset and a charge to operating expense.

During the six months ended June 30, 2024, the Company experienced a triggering event as a result of the restructuring initiatives that required an evaluation of our non-OGM Bionano Laboratories asset group for impairment. The Company performed a recoverability test and concluded that the non-OGM Bionano Laboratories long-lived assets were not recoverable; therefore, the Company measured the impairment loss and fully impaired the intangible assets acquired through the acquisition of Lineagen, consisting of its trade name and customer relationship intangible assets. The Company recognized an impairment loss of $0.4 million during the six months ended June 30, 2024. No impairment losses were recorded for the three months ended June 30, 2024 or during the three or six months ended June 30, 2023.

Inventories

The Company reviews its inventories for classification purposes. The value of inventories not expected to be realized in cash, sold or consumed during the next 12 months are classified as non-current within other long-term assets. As of June 30, 2024, $3.7 million of inventories were included in other long-term assets.

Change in depreciable lives of property and equipment

The Company reviews the estimated useful life of its fixed assets on an ongoing basis. This review indicated that the actual lives of the Company's Saphyr and Stratys instruments were longer than the estimated useful lives used for depreciation purposes in the Company's unaudited condensed consolidated financial statements. As a result, effective January 1, 2024, the Company changed its estimates of the useful lives of the Company's Saphyr and Stratys instruments to better reflect the estimated period during which these assets will remain in service. The estimated useful lives of the Company's Saphyr and Stratys instruments were increased from 5 to 7 years. The effect of this change in estimate reduced depreciation expense by $0.5 million.

Recent Accounting Pronouncements

From time to time, new accounting pronouncements are issued by the Financial Accounting Standards Board, or FASB, or other standard setting bodies. The Company believes that the impact of the recently issued accounting pronouncements that are not yet effective will not have a material impact on its condensed consolidated financial condition or results of operations upon adoption.

2. Net Loss Per Share

Basic net loss per share is calculated by dividing the net loss by the weighted-average number of common shares outstanding for the period. The Pre-Funded Warrants (as defined below) issued in the April 2024 Registered Direct Offering (as defined below) were exercised in full and included in the weighted-average number of common shares outstanding (See Note 6 (Stockholder's Equity and Stock-Based Compensation) for further information). Diluted net loss per share is computed by dividing the net loss by the weighted average number of common shares and common share equivalents outstanding for the period. Common share equivalents are only included when their effect is dilutive. The Company's potentially dilutive securities which include outstanding common warrants to purchase common stock, restricted stock units ("RSUs"), performance stock units ("PSUs"), and outstanding stock options under the Company's equity incentive plans have been excluded from the computation of diluted net loss per share as they would be anti-dilutive to the net loss per share. For all periods presented, there is no difference in the number of shares used to calculate basic and diluted shares outstanding because all potentially dilutive securities were anti-dilutive.

Potentially dilutive securities not included in the calculation of diluted net loss per share attributable to common stockholders because to do so would be anti-dilutive are as follows (in common stock equivalent shares):

	June 30, 2024	June 30, 2023
Stock options	4,361,000	3,346,000
Warrants	30,430,000	436,000
Convertible notes payable into common stock	10,000,000	—
RSUs	561,000	230,000
PSUs	29,000	29,000
Total	45,381,000	4,041,000

3. Revenue Recognition

Revenue by Source

	Three Months Ended June 30,		Six Months Ended June 30,	
	2024	2023	2024	2023
Instruments	$ 2,260,000	$ 2,450,000	$ 3,874,000	$ 4,346,000
Consumables	2,569,000	2,953,000	6,033,000	5,188,000
Software	1,681,000	1,206,000	3,431,000	2,522,000
Total product revenue	6,510,000	6,609,000	13,338,000	12,056,000
Service and other	1,261,000	2,053,000	3,202,000	4,021,000
Total revenue	$ 7,771,000	$ 8,662,000	$ 16,540,000	$ 16,077,000

Revenue by Geographic Location

	Three Months Ended June 30,				Six Months Ended June 30,			
	2024		2023		2024		2023	
	$	%	$	%	$	%	$	%
Americas	$ 3,386,000	44 %	$ 4,313,000	50 %	$ 8,076,000	49 %	$ 7,757,000	48 %
EMEA	3,624,000	47 %	2,748,000	32 %	6,757,000	41 %	5,740,000	36 %
Asia Pacific	761,000	10 %	1,601,000	18 %	1,707,000	10 %	2,580,000	16 %
Total	$ 7,771,000	100 %	$ 8,662,000	100 %	$ 16,540,000	100 %	$ 16,077,000	100 %

The table above provides revenue from contracts with customers by source and geographic region (based on the customer's billing address) on a disaggregated basis. Americas consists of North America and South America. EMEA consists of Europe, the Middle East, and Africa. Asia Pacific includes China, Japan, South Korea, Singapore, India and Australia.

For the three months ended June 30, 2024 and 2023, the United States represented 38.6% and 39.1% of total revenue, respectively. For the six months ended June 30, 2024 and 2023, the United States represented 40.7% and 40.1% of total revenue, respectively. For the three and six months ended June 30, 2023, China represented 15.0% and 10.2% of total revenue, respectively. No other countries represented greater than 10% of revenue during the three and six months ended June 30, 2024 and 2023.

Remaining Performance Obligations

As of June 30, 2024, the estimated revenue expected to be recognized in the future related to performance obligations that are unsatisfied was approximately $1.4 million. These remaining performance obligations primarily relate to extended warranty, support and maintenance obligations, as well as obligations related to software under hosting arrangements. The Company expects to recognize approximately 57.9% of this amount as revenue during the remainder of 2024, 30.8% in 2025, and 11.3% in 2026 and thereafter. Warranty revenue is included in service and other revenue.

The Company recognized revenue of approximately $0.4 million and $0.4 million during the three months ended June 30, 2024 and 2023, respectively, which was included in the contract liability balance at the end of the year preceding each period, and revenue of approximately $1.0 million and $1.1 million during the six months ended June 30, 2024 and 2023, respectively, which was included in the contract liability balance at the end of the year preceding each period.

4. Balance Sheet Account Details

Accounts Receivable and Allowance for Credit Losses

	June 30, 2024	December 31, 2023	December 31, 2022
Accounts receivable, net:			
Accounts receivable, trade	$ 6,693,000	$ 9,802,000	$ 7,315,000
Allowance for credit losses	(438,000)	(483,000)	(293,000)
	$ 6,255,000	$ 9,319,000	$ 7,022,000

Changes to the allowance for credit losses during the six months ended June 30, 2024 and 2023 were as follows:

	Allowance for Credit Losses
Balance as of January 1, 2023	$ (293,000)
Provision for expected credit loss	(5,000)
Write-offs	36,000
Balance as of June 30, 2023	$ (262,000)
Balance as of January 1, 2024	$ (483,000)
Provision for expected credit loss	(9,000)
Write-offs	54,000
Balance as of June 30, 2024	$ (438,000)

The Company’s analysis included an assessment of our aged trade receivables balances and their underlying credit risk characteristics. Our evaluation of past events, current conditions, and reasonable and supportable forecasts about the future resulted in an expectation of immaterial credit losses.

Inventory

The components of inventories are as follows:

	June 30, 2024	December 31, 2023
Inventory:		
Raw materials	$ 8,932,000	$ 7,567,000
Work in process	4,635,000	9,790,000
Finished goods	9,582,000	10,245,000
	$ 23,149,000	$ 27,602,000
Inventories current	$ 19,475,000	$ 22,892,000
Inventories non-current (included in other long-term assets)	$ 3,674,000	$ 4,710,000

Intangible Assets

Intangible assets that are subject to amortization consisted of the following for the periods presented:

	June 30, 2024			December 31, 2023		
	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount
Trade name	$ 2,000,000	$ (859,000)	$ 1,141,000	$ 2,630,000	$ (1,078,000)	$ 1,552,000
Customer relationships	3,200,000	(1,688,000)	1,512,000	4,150,000	(2,002,000)	2,148,000
Developed technology	41,600,000	(14,334,000)	27,266,000	41,600,000	(11,428,000)	30,172,000
Intangibles, net	$ 46,800,000	$ (16,881,000)	$ 29,919,000	$ 48,380,000	$ (14,508,000)	$ 33,872,000

Intangible assets not subject to amortization totaled $0.1 million at June 30, 2024 and December 31, 2023, and related to the Company's domain name.

Accrued Expenses

Accrued expenses consist of the following:

	June 30, 2024	December 31, 2023
Compensation expenses*	$ 3,605,000	$ 5,030,000
Customer deposits	17,000	17,000
Taxes payable	1,065,000	1,099,000
Insurance	44,000	512,000
Professional fees and royalties	299,000	387,000
Warranty liabilities	244,000	391,000
Accrued clinical study fees	1,000	138,000
Other	255,000	515,000
Total	$ 5,530,000	$ 8,089,000

*Compensation expenses include restructuring costs of $0.4 million as of June 30, 2024. Refer to Note 7 (Commitments and Contingencies).

5. Debt

JGB Debentures

On May 24, 2024, the Company entered into a securities purchase agreement with certain accredited investors (the "Holders") and JGB Collateral LLC, as collateral agent for the Holders, for the sale by the Company in a private placement (the "JGB Debentures Offering") of:

- 2.25 million shares (the "Shares") of the Company's common stock, par value $0.0001 per share ("Common Stock"), and
- Senior Secured Convertible Debentures in the aggregate principal amount of $20.0 million (the "Debentures"), for an aggregate purchase price of $18.0 million.

The closing of the JGB Debentures Offering occurred on May 24, 2024. In connection with the closing of the JGB Debentures Offering, the Company received net proceeds of approximately $16.6 million, after payment of placement agent fees, and other offering expenses. The Company used the proceeds received to fully redeem the outstanding balance due under the High Trail Note of approximately $17.6 million, as amended (see "High Trail Agreement & Amendment" below).

Debentures

The Debentures have an aggregate face value of $20.0 million and were issued with an original issue discount of $2.0 million. The Debentures mature on May 24, 2026, and have an interest rate of 11% per annum payable monthly on the last business day of each calendar month. As of June 30, 2024, the Company has paid the Holders $0.2 million in interest, which is included in the change in fair value within other income (expense), net.

The Company recorded the Debentures at their fair value at issuance of $19.9 million, per the fair value option under ASC 825 (refer to Note 8 (Investments and Fair Value Measurements)) and they will be measured on a recurring basis and adjusted through other income and expense, net. The Shares were recorded at $0 in common stock and additional paid in capital, which represents the residual amount after allocation of proceeds to the Debentures at fair value. The Company recognized an initial loss on the issuance of the Debentures of $1.9 million for the difference between the fair value of the Debentures and proceeds from the transaction, which is recorded in other income (expense) on the unaudited condensed consolidated statement of operations. The Company incurred debt issuance costs of $1.4 million related to the JGB Debentures Offering, which was charged to interest expense and recorded in other income (expense) on the unaudited condensed consolidated statement of operations.

On July 24, 2024, the Holders of the Debentures requested that the Company redeem up to $1.0 million per calendar month of its Debentures. The table below shows the amount of potential redemptions each year until the maturity of the Debentures.

2024	$	6,000,000
2025		12,000,000
2026		2,000,000
Total	$	20,000,000

The Company may redeem the Debentures, subject to certain Equity Conditions (as defined in the Debentures), at any time by paying an amount equal to the entire outstanding principal amount of the Debenture, plus all accrued and unpaid interest, plus the applicable Company Redemption Premium (as defined in the Debentures, the "Premium") plus any other amounts due and payable under the Debentures. The Premium is an amount equal to 112% of the principal amount of the Debenture if the redemption is prior to the first anniversary of the original issue date, or 106% of the principal amount of the Debenture if the redemption is on or after the first anniversary of the original issue date. No partial redemptions by the Company are permitted.

At the election of the holder, each Debenture is convertible, in whole or in part, at any time and from time to time at a conversion price of $2.00 per share of common stock. The conversion price is subject to adjustment for stock dividends, stock splits, and certain other corporate events. Notwithstanding the foregoing, the Company will not effect any conversion under the Debentures to the extent that such conversion would cause the holder's beneficial ownership of the Company's common stock to exceed 4.99% (or 9.99% at the election of the holder) of the Company's issued and outstanding common stock.

Under the Debentures, the Company must at all times maintain a cash balance equal to the lesser of (a) $11.0 million and (b) the then outstanding principal balance of the Debentures, in a blocked account. In addition, for as long as any portion of the Debentures remain outstanding, the Company is generally restricted from: incurring indebtedness; granting or suffering liens on any of its property or assets; amending its organizational documents; repurchasing any of its securities; paying dividends; selling, disposing, licensing or leasing its assets other than in the ordinary course; and other customary restrictive covenants. The Debentures also set forth certain customary events of default after which the Debentures may be declared immediately due

and payable, including certain types of bankruptcy or insolvency events of default involving the Company and its subsidiaries, and in the event of a change of control or fundamental transaction as defined in the Debentures.

As of June 30, 2024 the Company had $20.0 million of principal outstanding under the Debentures reported at fair value of $19.4 million (refer to Note 8 (Investments and Fair Value Measurements), for fair value measurements and additional discussion) and activity broken out as follows:

	Debentures
Principal balance, January 1, 2024	$ —
Issuance of convertible debentures	20,000,000
Less:	
Conversions	—
Redemption payments of principal	—
Notes principal balance, June 30, 2024	$ 20,000,000

High Trail Agreement & Amendment

On February 27, 2024, the Company entered into a letter agreement with High Trail and an amendment to the Registered Note (the "High Trail Amendment") which provided for, among other things, the following:

- Reduction of the minimum available liquidity covenant from $50.0 million to $25.0 million;
- Reduction of the restricted cash covenant from $35.0 million to the amount equal to the sum of (i) the outstanding principal amount of the senior secured convertible notes payable due 2025 (the "High Trail Registered Notes") plus (ii) approximately $0.7 million, which will be further reduced as the remaining principal on the High Trail Registered Notes are retired;
- Cancellation of the March 2024 partial redemption payment and delay of the April 2024 partial redemption payment;
- Redemption of the outstanding $17.0 million balance of the privately placed senior secured convertible notes payable due 2025 (the "High Trail Private Placement Notes") at a redemption price of 115% for a total redemption payment of approximately $19.6 million;
- Redemption of approximately $10.7 million of the High Trail Registered Notes at a redemption price of 115% for a total redemption payment of approximately $12.3 million; and
- Increase of $1.0 million to the Retirement Fee (as defined in the Notes) of the High Trail Private Placement Notes to $3.2 million payable concurrently with redemptions of the Initial Private Placement Note.

Immediately following the redemptions above, there was approximately $24.3 million in aggregate principal amount of the High Trail Registered Notes outstanding.

High Trail Redemption Agreement

On May 23, 2024, in connection with the JGB Debentures Offering, the Company entered into a redemption agreement with High Trail (the "HT Agreement"). Pursuant to the HT Agreement, the Company agreed to redeem the entire outstanding principal amount of $15.3 million under the High Trail Note at a redemption price of 115% for a total redemption payment of $17.6 million (the "Redemption Payment"). Upon High Trail's receipt of the Redemption Payment on May 24, 2024, the High Trail Note and related Option were cancelled. In addition, the Company agreed to pay High Trail a retirement fee of $2.2 million and to reimburse High Trail for all of its reasonable and documented out-of-pocket expenses incurred with the release and termination of security interests relating to the High Trail Note.

The Company recognized a loss on the extinguishment of the High Trail Note of $1.1 million, and a gain on the extinguishment of the Purchase Option (as defined in Note 7 (Commitments and Contingencies) below) of $5.1 million, for a net gain of $4.0 million, which is recorded in other income (expense) on the unaudited condensed consolidated statement of operations.

As of June 30, 2024, the Company had no principal outstanding under the High Trail Note (refer to Note 8 (Investments and Fair Value Measurements), for fair value measurements and additional discussion) and activity broken out as follows:

Principal balance, January 1, 2024		61,000,000
Less:		
Conversions		—
Partial redemption of principal		18,000,000
Redemption payment of principal		43,000,000
Total	$	—

In addition to redeeming $15.3 million and $27.7 million of the principal outstanding under the High Trail Note on May 24, 2024, and March 1, 2024, respectively, for an aggregate principal redemption of $43.0 million at the aggregate Redemption Price of $49.5 million, the Holders redeemed $4.5 million each of principal on January 1, 2024, February 1, 2024, April 20, 2024, and May 1, 2024, for an aggregate principal redemption of $18.0 million at an aggregate Repayment Price of $20.7 million. Under the terms of the High Trail Notes, the Holders had the option to redeem a portion of the Notes not to exceed $4.5 million principal on the first day of each month beginning November 1, 2023, at the Repayment Price. The April 2024 payment was delayed to April 20, 2024, under the High Trail Amendment as discussed above.

Other Income (Expense), Net

The following is a summary of the charges included within other income (expense), net on the unaudited condensed consolidated statement of operations:

	Three Months Ended June 30,		Six Months Ended June 30,	
	2024	2023	2024	2023
Debt issuance costs on sale of convertible debenture	(1,444,000)	—	(1,444,000)	—
Other interest expense	(74,000)	(74,000)	(195,000)	(149,000)
Changes in estimated fair value, interest and redemption payments on High Trail Notes and convertible debentures	298,000	—	(855,000)	—
Other expense	(492,000)	(256,000)	(579,000)	(139,000)
Gain on High Trail extinguishment	3,965,000	—	3,965,000	—
Loss on issuance of convertible debentures	(1,890,000)	—	(1,890,000)	—
Total other income (expense)	$ 363,000	$ (330,000)	$ (998,000)	$ (288,000)

6. Stockholders' Equity and Stock-Based Compensation

Reverse Stock Split

On August 4, 2023, the Company completed a reverse stock split of its outstanding shares of common stock pursuant to which every 10 shares of issued and outstanding common stock were exchanged for one share of common stock. No fractional shares were issued in the reverse stock split. Instead, the Company paid cash (without interest) equal to such fraction multiplied by $5.90 per share (a price equal to the average of the closing sales prices of the common stock on The Nasdaq Capital Market during regular trading hours for the five consecutive trading days immediately preceding August 4, with such average closing sales prices being adjusted to give effect to a Reverse Stock Split). All share and per share amounts included within these condensed consolidated financial statements have been retrospectively adjusted to reflect the reverse stock split.

Cowen At-the-Market Facility

On March 23, 2021, the Company entered into a Sales Agreement with Cowen and Company, LLC ("Cowen") which provides for the sale, in the Company's sole discretion, of shares of common stock having an aggregate offering price of up to $350.0 million through or to Cowen, acting as sales agent or principal, which was amended on March 9, 2023 to decrease the maximum aggregate offering price to $200.0 million for sales made on and after the date of the amendment (the "Cowen ATM"). The Company agreed to pay Cowen a commission of up to 3.0% of the aggregate gross proceeds from each sale of shares, reimburse legal fees and disbursements and provide Cowen with customary indemnification and contribution rights. During the six months ended June 30, 2024, the Company sold approximately 14.0 million shares of common stock under the Cowen ATM at an average share price of $1.26 per share, and received gross proceeds of approximately $17.6 million before deducting offering costs of $0.4 million.

Stock Warrants

A summary of the Company's warrant activity during the six months ended June 30, 2024 was as follows:

	Shares of Stock under Warrants	Weighted-Average Exercise Price	Weighted-Average Remaining Contractual Term	Aggregate Intrinsic Value
Outstanding at January 1, 2024	21,696,000	$ 4.38	4.78	$ —
Granted	10,931,000	0.82	—	—
Exercised	(2,197,000)	—	—	—
Canceled	—	—	—	—
Outstanding at June 30, 2024	30,430,000	$ 3.41	4.43	$ —

Stock Options

A summary of the Company's stock option activity during the six months ended June 30, 2024 was as follows:

	Shares of Stock under Stock Options	Weighted-Average Exercise Price	Weighted-Average Remaining Contractual Term	Aggregate Intrinsic Value
Outstanding at January 1, 2024	3,268,000	$ 24.79	7.80	$ 3,000
Granted	1,663,000	0.93	—	
Exercised	—	—	—	—
Canceled	(570,000)	23.06	—	
Outstanding and expected to vest at June 30, 2024	4,361,000	$ 15.92	8.23	$ —
Vested and exercisable at June 30, 2024	1,701,000	$ 28.55	6.53	$ —

For the three months ended June 30, 2024, the weighted-average grant date fair value of stock options granted was $0.67 per share. For the six months ended June 30, 2024, the weighted-average grant date fair value of stock options granted was $0.67 per share.

Stock-Based Compensation

The Company recognized stock-based compensation expense for the periods presented as follows:

	Three Months Ended June 30,		Six Months Ended June 30,	
	2024	2023	2024	2023
Cost of product revenue	$ 81,000	$ 154,000	$ 162,000	$ 256,000
Cost of service and other revenue	47,000	44,000	94,000	88,000
Research and development	114,000	1,301,000	1,285,000	$ 2,658,000
General and administrative	2,341,000	2,433,000	4,057,000	4,812,000
Total stock-based compensation expense	$ 2,583,000	$ 3,932,000	$ 5,598,000	$ 7,814,000

The weighted-average assumptions used in the Black-Scholes option pricing model to determine the fair value of the employee stock option grants during the periods presented were as follows:

	Three Months Ended June 30,		Six Months Ended June 30,	
	2024	2023	2024	2023
Risk-free interest rate	4.3 %	3.9 %	4.3 %	3.9 %
Expected volatility	86.4 %	80.5 %	86.2 %	74.4 %
Expected term (in years)	5.7	5.5	5.7	5.9
Expected dividend yield	0.0 %	0.0 %	0.0 %	0.0 %

Restricted Stock Units and Performance Stock Units

The following table summarizes RSU activity during the six months ended June 30, 2024:

	Stock Units	Weighted- Average Grant Date Fair Value per Share
Outstanding at January 1, 2024	239,000	$ 16.30
Granted	407,000	0.93
Released	(48,000)	16.30
Forfeited	(37,000)	16.13
Outstanding at June 30, 2024	561,000	$ 16.19

The total fair value of the RSUs that vested during the six months ended June 30, 2024 was $0.8 million, determined as of the date of vesting. The weighted average remaining contractual term for the RSUs is 3.5 years as of June 30, 2024.

The following table summarizes PSU activity during the six months ended June 30, 2024:

	Stock Units	Weighted- Average Grant Date Fair Value per Share
Outstanding at January 1, 2024	29,000	$ 47.40
Granted	—	—
Released	—	—
Forfeited	—	—
Outstanding at June 30, 2024	29,000	$ 47.40

During the year ended December 31, 2023, the Company reassessed the implicit service period on its performance-based stock units relative to specified revenue targets and determined that the performance conditions were met from an accounting perspective, but subject to certain certifications and approval from the Compensation Committee; therefore, the remaining

expense was accelerated as of December 31, 2023. As a result of the accelerated vesting terms, the weighted average remaining contractual term for the PSUs is 0 years as of June 30, 2024.

Registered Direct Offerings

On April 4, 2024, the Company entered into a securities purchase agreement (the "April 2024 Purchase Agreement") with certain institutional investors, pursuant to which the Company agreed to issue and sell, in a registered direct offering priced at-the-market consistent with the rules of the Nasdaq Stock Market (the "April 2024 Registered Direct Offering"): (i) an aggregate of 6.5 million shares of the Company's common stock, (ii) pre-funded warrants to purchase up to an aggregate of 2.2 million shares of common stock (the "April Pre-Funded Warrants"), and (iii) warrants to purchase up to 8.7 million shares of common stock (the "April Purchase Warrants"). The combined purchase price of each share of common stock and accompanying April Purchase Warrant is $1.15 per share. The combined purchase price of each April Pre-Funded Warrant and accompanying April Purchase Warrant is $1.14 (equal to the combined purchase price per share of common stock and accompanying April Purchase Warrant, minus $0.001). The gross proceeds to the Company from the April 2024 Registered Direct Offering was $10.0 million. The Company received net proceeds of $9.3 million after deducting placement agent fees and other offering expenses of $0.7 million payable by the Company.

Each April Purchase Warrant is exercisable for one share of common stock at an exercise price of $1.02 per share. The Purchase Warrants are immediately exercisable as of the date of issuance of April 8, 2024, and will expire on the five-year anniversary of the date of issuance. The April Pre-Funded Warrants are offered in lieu of shares of common stock and provide that the holder may not exercise any portion of an April Pre-Funded Warrant to the extent that immediately prior to or after giving effect to such exercise the holder would own more than 4.99% (or, at the election of the holder, 9.99%) of the Company's outstanding common stock immediately following the consummation of the April 2024 Registered Direct Offering. Each April Pre-Funded Warrant is exercisable for one share of common stock at an exercise price of $0.001 per share. The April Pre-Funded Warrants are immediately exercisable and were exercised in full at the time of closing.

On July 4, 2024, the Company entered into a securities purchase agreement (the "July 2024 Purchase Agreement") with certain institutional investors, pursuant to which the Company agreed to issue and sell, (i) in a registered direct offering priced at-the-market consistent with the rules of the Nasdaq Stock Market (the "July 2024 Registered Direct Offering"): (a) an aggregate of 11.7 million shares of the Company's common stock, , and (b) pre-funded warrants to purchase up to an aggregate of 5.8 million shares of common stock (the "July Pre-Funded Warrants"), and (ii) in a concurrent private placement (the "Private Placement" and together with the July 2024 Registered Direct Offering, the "July 2024 Offering"), Series A warrants to purchase up to an aggregate of 17.5 million shares of common stock (the "Series A Warrants") and Series B warrants to purchase up to an aggregate of 17.5 million shares of common stock (the "Series B Warrants", and together with the Series A Warrants, the "July Purchase Warrants"). Each share of common stock and each July Pre-Funded Warrant sold pursuant to the Purchase Agreement will be accompanied by one Series A Warrant and one Series B Warrant. The combined purchase price of each share of common stock and accompanying July Purchase Warrants is $0.571 per share. The combined purchase price of each July Pre-Funded Warrant and accompanying July Purchase Warrants is $0.571 (equal to the combined purchase price per share of common stock and accompanying July Purchase Warrants, minus $0.001). The gross proceeds to the Company from the July 2024 Offering was approximately $10.0 million (excluding up to $20.0 million of aggregate gross proceeds that may be received in the future upon the cash exercise of the July Purchase Warrants issued in the Private Placement), before deducting placement agent fees and other offering expenses payable by the Company. The Company received net proceeds of $9.3 million after deducting placement agent fees and other offering expenses of $0.7 million payable by the Company.

Each July Purchase Warrant is exercisable for one share of common stock at an exercise price of $0.571 per share beginning on the effective date of stockholder approval of the issuance of the shares of common stock upon exercise of the July Purchase Warrants (the "Stockholder Approval"). The Series A Warrants will expire on the earlier of (i) the 24-month anniversary of the Stockholder Approval and (ii) 60 days following the later of (a) the date of the public announcement of the occurrence of a medical administrative contractor (including, without limitation, Molecular Diagnostic Services), issuing a final local coverage determination for optical genome mapping for hematological malignancies and (b) the date of the Stockholder Approval. The Series B Warrants will expire on the earlier of (i) the five-year anniversary of the Stockholder Approval and (ii) six months following the later of (a) the date of the public announcement of the occurrence of the Company receiving clearance from the U.S. Food and Drug Administration for an optical genome mapping system for any indication and (b) the date of the Stockholder Approval.

7. Commitments and Contingencies

The Company has entered into various operating lease agreements and a finance lease agreement, primarily relating to our office, laboratory, and manufacturing space. See Note 11 (Commitments and Contingencies), subsection titled “Leases”, in Part II, Item 8 of the Annual Report on Form 10-K for the year ended December 31, 2023 for information regarding the Company’s lease agreements.

The future minimum payments under non-cancellable operating and finance leases as of June 30, 2024, are as follows:

	Operating Leases	Finance Lease
Remainder of 2024	$ 1,414,000	$ 166,000
2025	2,608,000	338,000
2026	545,000	346,000
2027	254,000	356,000
2028	—	365,000
Thereafter	—	5,230,000
Total future lease payments	4,821,000	6,801,000
Less: imputed interest	(440,000)	(2,971,000)
Total lease liabilities	$ 4,381,000	$ 3,830,000

Restructuring

The workforce reduction described in Note 1 (Organization and Basis of Presentation) resulted in total restructuring charges of approximately $4.4 million, comprised primarily of severance payments and wages for the 60-day notice period in accordance with the California Worked Adjustment and Retraining Notification (WARN) Act.

The following is a summary of restructuring charges associated with the reduction in force for the three and six months ended June 30, 2024 including severance, impairment, and other exit related costs:

	Three Months Ended June 30,	Six Months Ended June 30,
	2024	2024
Severance	$ 552,000	$ 4,426,000
Lease related expenses	163,000	374,000
Other	500,000	1,047,000
Total restructuring charges including in operating expenses	$ 1,215,000	$ 5,847,000
COGS restructuring	$ 7,000	$ 18,000
Total restructuring charges	$ 1,222,000	$ 5,865,000

The following restructuring liability activity was recorded in connection with the reduction in force for the six months ended June 30, 2024 including within accrued expenses on the unaudited condensed consolidated financial statements:

Accrued restructuring as of January 1, 2024	$ 83,000
Restructuring charges incurred during the period	5,865,000
Cash payments	(5,592,000)
Accrued restructuring as of June 30, 2024	$ 356,000

Litigation

From time to time, the Company may be subject to potential liabilities under various claims and legal actions that are pending or may be asserted. These matters arise in the ordinary course and conduct of the business. The Company regularly assesses contingencies to determine the degree of probability and range of possible loss for potential accrual in the unaudited condensed consolidated financial statements. An estimated loss contingency is accrued in the unaudited condensed consolidated financial statements if it is probable that a liability has been incurred and the amount of the loss can be reasonably estimated. Based on the Company's assessment, it currently does not have any material loss exposure as it is not a defendant in any claims or legal actions.

Contingent Consideration

See Note 8 (Investments and Fair Value Measurements) for a discussion of the contingent consideration liability.

8. Investments and Fair Value Measurements

The Company holds investment securities that consist of highly liquid, investment grade debt securities. The Company determines the fair value of its investment securities based upon one or more valuations reported by its investment accounting and reporting service provider. The investment service provider values the securities using a hierarchical security pricing model that relies primarily on valuations provided by an industry-recognized valuation service. Such valuations may be based on trade prices in active markets for identical assets or liabilities (Level 1 inputs) or valuation models using inputs that are observable either directly or indirectly (Level 2 inputs), such as quoted prices for similar assets or liabilities, yield curves, volatility factors, credit spreads, default rates, loss severity, current market and contractual prices for the underlying instruments or debt, and broker and dealer quotes, as well as other relevant economic measures.

The following table presents the Company's financial assets and liabilities measured at fair value on a recurring basis as of June 30, 2024 and December 31, 2023:

	June 30, 2024			
		Fair Value Measurement Category		
	Total Fair Value and Carrying Value on Balance Sheet	Level 1	Level 2	Level 3
Assets:				
U.S. treasuries	8,516,000	—	8,516,000	—
Total investments:	$ 8,516,000	$ —	$ 8,516,000	$ —
Money market funds classified as cash equivalents	$ 8,010,000	$ 8,010,000	$ —	$ —
Money market funds classified as restricted cash	$ 11,008,000	$ 11,008,000	$ —	$ —
Liabilities:				
Contingent consideration	$ 5,774,000	$ —	$ —	$ 5,774,000
Convertible notes payable	$ 19,359,000	$ —	$ —	$ 19,359,000

	December 31, 2023			
		Fair Value Measurement Category		
	Total Fair Value and Carrying Value on Balance Sheet	Level 1	Level 2	Level 3
Assets:				
Corporate notes/bonds	14,360,000	—	14,360,000	—
U.S. treasuries	34,463,000		34,463,000	
Total investments:	$ 48,823,000	$ —	$ 48,823,000	$ —
Money market funds classified as cash equivalents	$ 9,752,000	$ 9,752,000	$ —	$ —
Commercial paper classified as restricted investments	5,432,000	—	5,432,000	—
U.S. treasuries classified as restricted investments	29,685,000	—	29,685,000	—
Total restricted investments:	$ 35,117,000	$ —	$ 35,117,000	$ —
Liabilities:				
Contingent consideration	$ 10,890,000	$ —	$ —	$ 10,890,000
Convertible notes payable	$ 69,803,000	$ —	$ —	$ 69,803,000
Purchase option liability	$ 8,534,000	$ —	$ —	$ 8,534,000

Contingent Consideration

Contingent consideration relates to the acquisitions of BioDiscovery and Purigen. The outcome of the milestone consideration for all contingent consideration liabilities is binary, meaning the milestones are either achieved or not achieved, and the only other variable factor is the timing of when the milestones are achieved. The fair value measurement of the contingent consideration liabilities is based on significant inputs not observed in the market (Level 3 inputs). These unobservable inputs represent a Level 3 measurement because they are supported by little or no market activity and reflect the Company's assumptions in measuring fair value.

The BioDiscovery milestone consideration was paid in full in 2023.

Contingent consideration liabilities related to the Purigen acquisition are related to the achievement of two independent milestones with aggregate possible milestone payments totaling $32.0 million.

The fair value of the Purigen milestones are reassessed on a quarterly basis using a probability weighted model and a Monte Carlo Simulation. Assumptions used to estimate the fair value of the milestones using a probability weighted model include the probability of achieving independent milestones, anticipated payment date and a discount rate of 14.4% and 13.2% as of June 30, 2024 and December 31, 2023, respectively. The Company determines the likelihood of each milestone payment which is then applied to the individual payments over the five-year milestone terms. As of June 30, 2024, the Company assessed the probability of meeting the first milestone at 0% which resulted in a reduction in the contingent consideration liability. The probability factors as of December 31, 2023 ranged from 9% to 49%.

For the second milestone, a Monte Carlo Simulation was performed to determine the likelihood that the milestone will be achieved to determine the milestone consideration payment. Assumptions include the projected units, revenue discount rates of

8% and 7% and discount rates of 14.4% and 13.2% as of June 30, 2024 and December 31, 2023, respectively. The fair value of the Purigen contingent consideration as of June 30, 2024 and December 31, 2023 was $5.8 million and $10.9 million, respectively.

Convertible debentures payable, convertible notes payable and purchase option liability

	June 30, 2024	December 31, 2023
Expected volatility	86.60 %	80.20 %
Risk-free interest rate	4.78 %	4.92 %
Term to maturity (years)	1.66	0.80
Debt discount rate	17.90 %	17.11 %
Equity discount rate	4.78 %	4.92 %

The June 30, 2024 assumptions in the table above reflect the convertible debentures payable, which were issued on May 24, 2024. For December 31, 2023, the table reflects a weighted average of assumptions based on the fair value of the convertible notes payable from the High Trail Agreement (refer to Note 5 (Debt)).

The volatility is based on an analysis of the Company and its peers' historical stock price, the risk-free rate is based on US treasury yields, the equity discount rate is based on term-specific US treasury yields, and the debt discount rate is based on the Company's credit rating.

In connection with the Notes, the purchaser was granted an option (the "Purchase Option") which expired on the maturity date of the Notes to purchase up to an additional $25.0 million aggregate principal amount of private placement notes (the "Subsequently Purchased Notes") and warrants (refer to Note 5 (Debt)). The estimated fair value of the Purchase Option as of the valuation date was assessed as the difference in the aggregate indicated value of the Subsequently Purchased Notes and the consideration to be paid upon exercising the option which was estimated to be $0.0 million and $8.5 million at June 30, 2024 and December 31, 2023, respectively. The outstanding amount of the High Trail Notes was redeemed on May 24, 2024, and the Purchase Option rights no longer exist.

The terms used to estimate the fair value of the Subsequently Purchased Notes and warrant underlying the Purchase Option liability (the "Subsequently Purchased Warrants") as of December 31, 2023 are as follows:

	Subsequently Purchased Notes	Subsequently Purchased Warrants
	December 31, 2023	December 31, 2023
Expected volatility	80.20 %	66.20 %
Risk-free interest rate	4.46 %	3.80 %
Term to maturity (years)	1.50	5.00
Dividend yield	— %	— %
Exercise price	—	$3.19
Debt discount rate	16.60 %	— %
Equity discount rate	4.46 %	— %

Changes in estimated fair value of contingent consideration liability, convertible debentures payable, convertible notes payable and option liability in the six months ended June 30, 2024 are as follows:

	Contingent Consideration Liability (Level 3 Measurement)	Convertible Debentures Payable (Level 3 Measurement)	Convertible Notes Payable (Level 3 Measurement)	Option Liability (Level 3 Measurement)
Balance as of January 1, 2024	$ 10,890,000	$ —	$ 69,803,000	$ 8,534,000
Issuance of convertible debentures payable, convertible notes payable and option	—	19,890,000	—	—
Change in estimated fair value, recorded in selling, general and administrative expenses	(5,116,000)		—	—
Changes in estimated fair value, recorded in other income (expense), net	—	(531,000)	(4,524,000)	(3,474,000)
Cash payments	—		(61,000,000)	—
Cash payments on redemptions			(5,374,000)	
(Gain)/loss on extinguishment of High Trail			1,095,000	(5,060,000)
Balance as of June 30, 2024	$ 5,774,000	$ 19,359,000	$ —	$ —

Changes in estimated fair value of contingent consideration liability in the six months ended June 30, 2023 is as follows:

	Contingent Consideration Liability (Level 3 Measurement)
Balance as of January 1, 2023	$ 22,352,000
Change in estimated fair value, recorded in selling, general and administrative expenses	2,218,000
Balance as of June 30, 2023	$ 24,570,000

Available for Sale Investments

The Company invests its excess cash in U.S. Treasury and agency securities, corporate debt securities, and commercial paper, which are classified as available-for-sale investments. These investments are carried at fair value and are included in the tables below. The Company records an allowance for credit losses when unrealized losses are due to credit-related factors. At each reporting date, the Company evaluates securities with unrealized losses to determine whether such losses, if any, are due to credit-related factors. The Company evaluates, among others, whether the Company has the intention to sell any of these investments and whether it is not more likely than not that the Company will be required to sell any of them before recovery of the amortized cost basis. Neither of these criteria were met in any period presented. The credit ratings of the securities held remain of the highest quality. Moreover, the Company continues to receive payments of interest and principal as they become due, and our expectation is that those payments will continue to be received timely. Based on this evaluation, as of June 30, 2024 and December 31, 2023, the Company determined that unrealized losses of the below securities were primarily attributable to changes in interest rates and non-credit related factors. As such, no allowances for credit losses were recorded during these periods.

As of June 30, 2024 and December 31, 2023, the Company held 4 and 15 securities, respectively, which have been in an unrealized loss position for a period of less than 12 months. As of June 30, 2024 and December 31, 2023, the Company held 0 and 2 securities, respectively, which have been in an unrealized loss position for a period of greater than 12 months.

Realized gains and losses are calculated using the specific identification method and recorded in other income (expense) in the Company's unaudited condensed consolidated statements of operations and comprehensive loss. The Company has the ability, if necessary, to liquidate any of its cash equivalents and marketable securities to meet its liquidity needs in the next 12 months.

During the six months ended June 30, 2024, the Company sold 18 of its available for sale securities and received proceeds of $33.3 million. During the six months ended June 30, 2024, the Company recognized a loss of $0.018 million in other income relating to the maturity of its securities. Amounts are reclassified out of accumulated other comprehensive income into earnings using the specific identification method.

Interest receivable as of June 30, 2024 and December 31, 2023 was $0.1 million and $0.3 million, respectively, and is recorded as a component of prepaid expenses and other current assets on the unaudited condensed consolidated balance sheets.

As of June 30, 2024, the following table summarizes the amortized cost and the unrealized gains (losses) of the available for sale securities presented within investments:

	Remaining Contractual Maturity (in years)	Amortized Cost	Unrealized Gains	Unrealized Losses	Aggregate Estimated Fair Value
U.S. treasuries	Less than 1	8,519,000	—	(3,000)	8,516,000
Total maturity less than 1 year		$ 8,519,000	$ —	$ (3,000)	$ 8,516,000

As of June 30, 2024, the amortized cost and the unrealized gains (losses) of the available for sale securities listed as restricted investments was zero.

As of December 31, 2023, the following table summarizes the amortized cost and the unrealized gains (losses) of the available for sale securities presented within investments:

	Remaining Contractual Maturity (in years)	Amortized Cost	Unrealized Gains	Unrealized Losses	Aggregate Estimated Fair Value
Corporate notes/bonds	Less than 1	$ 14,369,000	$ —	$ (9,000)	$ 14,360,000
U.S. treasuries	Less than 1	34,459,000	4,000	—	34,463,000
Total maturity less than 1 year		$ 48,828,000	$ 4,000	$ (9,000)	$ 48,823,000

As of December 31, 2023, the following table summarizes the amortized cost and the unrealized gains (losses) of the available for sale securities listed as restricted investments:

	Remaining Contractual Maturity (in years)	Amortized Cost	Unrealized Gains	Unrealized Losses	Aggregate Estimated Fair Value
Commercial paper	Less than 1	$ 5,435,000	$ —	$ (3,000)	$ 5,432,000
U.S. treasuries	Less than 1	29,682,000	5,000	(2,000)	29,685,000
Total maturity less than 1 year		$ 35,117,000	$ 5,000	$ (5,000)	$ 35,117,000

As of June 30, 2024, the following table summarizes available-for-sale securities in an unrealized loss position:

	Less Than 12 Months		12 Months or Greater		Total	
	Fair Value	Gross Unrealized Loss	Fair Value	Gross Unrealized Loss	Fair Value	Gross Unrealized Loss
U.S. treasuries	8,516,000	(3,000)	—	—	8,516,000	(3,000)
Total	$ 8,516,000	$ (3,000)	$ —	$ —	$ 8,516,000	$ (3,000)

As of June 30, 2024, the available-for-sale securities listed as restricted investments in an unrealized loss position was zero.

As of December 31, 2023, the following table summarizes available-for-sale securities in an unrealized loss position:

	Less Than 12 Months		12 Months or Greater		Total	
	Fair Value	Gross Unrealized Loss	Fair Value	Gross Unrealized Loss	Fair Value	Gross Unrealized Loss
Corporate Notes/Bonds	$ 2,362,000	$ (5,000)	$ 10,001,000	$ (4,000)	$ 12,363,000	$ (9,000)
Total	$ 2,362,000	$ (5,000)	$ 10,001,000	$ (4,000)	$ 12,363,000	$ (9,000)

As of December 31, 2023, the following table summarizes available-for-sale securities listed as restricted investments in an unrealized loss position:

	Less Than 12 Months		12 Months or Greater		Total	
	Fair Value	Gross Unrealized Loss	Fair Value	Gross Unrealized Loss	Fair Value	Gross Unrealized Loss
Commercial paper	$ 5,432,000	$ (3,000)	$ —	$ —	$ 5,432,000	$ (3,000)
U.S. treasuries	11,789,000	(2,000)	—	—	11,789,000	(2,000)
Total	$ 17,221,000	$ (5,000)	$ —	$ —	$ 17,221,000	$ (5,000)

ITEM 2. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

The following discussion and analysis of our financial condition and results of operations should be read in conjunction with our unaudited condensed consolidated financial statements and related notes included in this Quarterly Report on Form 10-Q for the three and six months ended June 30, 2024 ("Quarterly Report") and the audited consolidated financial statements and notes thereto as of and for the year ended December 31, 2023 and the related Management's Discussion and Analysis of Financial Condition and Results of Operations, both of which are contained in our Annual Report on Form 10-K for the year ended December 31, 2023, ("Annual Report"), filed with the Securities and Exchange Commission, ("SEC"), on March 9, 2023. Unless the context requires otherwise, references in this Quarterly Report on Form 10-Q to "we," "us," and "our" refer to Bionano Genomics, Inc. and its subsidiaries or, as the context may require, Bionano Genomics, Inc. only.

Forward-Looking Statements

The information in this Quarterly Report contains forward-looking statements and information within the meaning of Section 27A of the Securities Act of 1933, as amended, or the Securities Act, and Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act, which are subject to the "safe harbor" created by those sections. These forward-looking statements include, but are not limited to any statements concerning our strategy, future operations, future financial position, future revenues, projected costs, expected savings including from restructuring initiatives, projected cash runway, prospects and plans, expected growth in sales of instruments and consumables, installed bases and provision of clinical services, and objectives of management. The words "anticipates," "believes," "estimates," "expects," "intends," "may," "plans," "projects," "will," "would" and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words. We may not actually achieve the plans, intentions, or expectations disclosed in our forward-looking statements and you should not place undue reliance on our forward-looking statements. Actual results or events could differ materially from the plans, intentions and expectations disclosed in the forward-looking statements that we make. These forward-looking statements involve risks and uncertainties that could cause our actual results to differ materially from those in the forward-looking statements, including, without limitation, the risks set forth- under Part II, Item 1A. Risk Factors in this Quarterly Report and in our other filings with the SEC. The forward-looking statements are applicable only as of the date on which they are made, and we do not assume any obligation to update any forward-looking statements.

Overview

We are a provider of genome analysis solutions that can enable researchers and clinicians to reveal answers to challenging questions in biology and medicine. Our mission is to transform the way the world sees the genome through optical genome mapping ("OGM") solutions, diagnostic services and software. We offer OGM solutions for applications across basic, translational and clinical research, and for other applications including bioprocessing. We offer a platform-agnostic software solution, which integrates next-generation sequencing, microarray and OGM data designed to provide analysis, visualization, interpretation and reporting of copy number variants, single-nucleotide variants and absence of heterozygosity across the genome in one consolidated view. The Company also offers nucleic acid extraction and purification solutions using proprietary isotachophoresis ITP technology. Through our Bionano Laboratories business, we also provide OGM-based diagnostic testing services.

Recent Highlights

Commercial Adoption of Offerings for OGM Systems

In executing on our commercialization strategy, we expanded the utilization of our OGM systems and:

- Grew our installed base to 363 as of June 30, 2024, an increase of approximately 29% from a total installed base of 281 as of June 30, 2023. Installed base represents the global number of OGM instruments installed at end-customer locations and therefore having the technology to process OGM.
- Sold 6,165 flowcells in the three-month period ended June 30, 2024, a decrease of approximately 13% from 7,062 flowcells sold in the same quarter of 2023. Sold 14,414 flowcells in the six-month period ended June 30, 2024, an

increase of approximately 12% from 12,888 flowcells sold in the same period of 2023.The OGM cartridge is the consumable that packages nanochannel arrays for DNA linearization. In its current form, the OGM cartridge can comprise - one, two or three flowcells per cartridge. Flowcells sold refers to the units of genome mapping consumables used for analyzing one genome, purchased by customers to process samples for optical genome mapping. The decrease in flowcells was partially due to the slowdown in regular routine use from customers transitioning from Saphyr to Stratys as well as related to three of our OEM partners in China who underperformed against their purchasing commitments during the three months ended June 30, 2024.

Macroeconomic and Geopolitical Developments

We are subject to additional risks and uncertainties as a result of adverse geopolitical and macroeconomic developments, such as recent and potential future bank failures, the ongoing conflict between Ukraine and Russia and related sanctions, the Israel-Hamas war, any effects of global pandemics and uncertain market conditions, including inflation and supply chain disruptions, which could continue to have a material impact on our business and financial results. For example, we are anticipating a potential protracted slowdown in our Asia Pacific business due to funding headwinds in the region, which are negatively impacting these manufacturing partners who are reliant on government funding,and are awaiting approval from the NMPA.

We closely monitor and comply with various applicable guidelines and legal requirements in the jurisdictions in which we operate. In the past, we have experienced supply chain challenges, attributable to such adverse geopolitical and macroeconomic developments including increased costs to secure certain component parts in our products and to produce our products at our contract manufacturers. During the six months ended June 30, 2024, we did not experience material increases in our supply chain costs, but we may experience such increases in future fiscal periods. We expect our costs to remain high for the foreseeable future. As global economic conditions recover, business activity may not recover as quickly as anticipated, and it is not possible at this time to estimate the long-term impact that these and related events could have on our business, as the impact will depend on future developments, which are highly uncertain and cannot be predicted. For instance, product demand may be reduced due to an economic recession, a decrease in corporate capital expenditures, prolonged unemployment, high inflation rates, labor shortages, reduction in consumer confidence, adverse geopolitical and macroeconomic developments, or any similar negative economic condition. These negative effects could have a material impact on our operations, business, earnings, and liquidity.

Recent Developments

In March 2024, we announced a cost savings plan that aims to reduce annualized operating expenses by approximately $35.0 to $40.0 million starting in the second half of 2024. As part of the plan, we reduced our overall headcount by approximately 120 employees. The Company has substantially completed the reduction in force as of June 30, 2024. In addition, on March 1, 2024, we decided to phase out the offering by Bionano Laboratories of certain testing services related to related to neurodevelopmental disorders, including autism spectrum disorders and other disorders of childhood development. These cost-saving measures are incremental to the cost saving initiatives previously announced in May 2023 and October 2023. See Note 7 (Commitments and Contingencies) to our unaudited condensed consolidated financial statements included elsewhere in this Quarterly Report for additional information.

Financial Overview

Revenue

We generate product revenue from sales of our OGM and Ionic® Purification systems and consumables, which includes our instruments, and our VIA™ software. At the end of July 2023 we began installations of VIA software as a replacement to NxClinical software. Like NxClinical, VIA has a simple integrated workflow for visualization, interpretation and reporting of NGS and microarray data. VIA additionally incorporates OGM data to that workflow creating a standard software tool for use across molecular pathology and cytogenomics applications. We currently sell our systems for research use only applications and our customers are primarily laboratories associated with academic and governmental research institutions, academic and commercial clinical laboratories, as well as pharmaceutical, biotechnology and contract research companies. In addition, we provide instruments to certain customers at no cost under our reagent rental program, and the customers agree to purchase minimum quantities of consumables. Consumable revenue consists of sales of reagents and chips necessary to process a sample. Sales of our VIA software, which provides customers with solutions for analysis, interpretation and reporting of genomic data, are made on a subscription basis. We generate service revenue from the sale of diagnostic testing services for those with autism spectrum disorder and other neurodevelopmental disabilities through Bionano Laboratories, as well as services performed related to customer sample evaluations using an OGM system. Other revenue consists of warranty and other service-based revenue, including support, repair and maintenance services.

The following table presents our revenue for the periods indicated:

	Three Months Ended June 30,		Six Months Ended June 30,	
	2024	2023	2024	2023
Product revenue	$ 6,510,000	$ 6,609,000	$ 13,338,000	$ 12,056,000
Service and other revenue	1,261,000	2,053,000	3,202,000	4,021,000
Total	$ 7,771,000	$ 8,662,000	$ 16,540,000	$ 16,077,000

The following table reflects total revenue by geography and as a percentage of total revenue, based on the billing address of our customers. Americas consists of North America and South America. EMEA consists of Europe, the Middle East, and Africa. Asia Pacific includes China, Japan, South Korea, Singapore, India and Australia.

	Three Months Ended June 30,				Six Months Ended June 30,			
	2024		2023		2024		2023	
	$	%	$	%	$	%	$	%
Americas	$ 3,386,000	44 %	$ 4,313,000	50 %	$ 8,076,000	49 %	$ 7,757,000	48 %
EMEA	3,624,000	47 %	2,748,000	32 %	6,757,000	41 %	5,740,000	36 %
Asia Pacific	761,000	10 %	1,601,000	18 %	1,707,000	10 %	2,580,000	16 %
Total	$ 7,771,000	100 %	$ 8,662,000	100 %	$ 16,540,000	100 %	$ 16,077,000	100 %

Cost of Revenue

Cost of product revenue for our systems and consumables includes raw material parts costs and associated freight, shipping and handling costs, contract manufacturing costs, salaries and other personnel costs, equipment depreciation, overhead and other direct costs related to those sales recognized as product revenue in the period. Cost of service and other revenue consists of third-party laboratory costs to process the diagnostic samples, salaries of our clinical technicians who interpret and deliver the results to patients, warranty services, and other costs of servicing equipment at customer sites.

Research and Development Expenses

Research and development expenses consist of salaries and other personnel costs, stock-based compensation, research supplies, third-party development costs for new products, materials for prototypes, equipment depreciation, and allocated overhead costs that include facility and other overhead costs. We have made substantial investments in research and development since our inception, and plan to continue to make investments in the future. Our research and development efforts have focused primarily on the tasks required to support development and commercialization of existing products. We believe that our continued investment in research and development is essential to our long-term competitive position.

Selling, General and Administrative Expenses

Selling, general and administrative expenses consist primarily of salaries and other personnel costs, amortization expense related to acquired intangibles, and stock-based compensation for our sales and marketing, finance, legal, human resources and general management, as well as professional services, such as legal and accounting services.

Results of Operations

We have incurred losses in each year since our inception. Our net loss was $16.2 million and $47.6 million for the three and six months ended June 30, 2024, respectively. As of June 30, 2024, we had an accumulated deficit of $628.9 million.

We expect to continue to incur significant expenses and operating losses as we:

- continue our sales and marketing efforts to further commercialize our products;
- continue research and development efforts to improve our existing products;
- enter into collaboration arrangements, if any;
- add operational, financial and management information systems; and
- incur increased costs as a result of operating as a public company.

Accordingly, based on recurring losses from operations incurred since inception, the expectation of continued operating losses, and the need to raise additional capital to finance our future operations, we determined that there is substantial doubt about our

ability to continue as a going concern within 12 months after the date that the financial statements included in this Quarterly Report are issued.

We will continue to seek to raise additional capital, but without additional financing we may not be able to continue as a going concern. If we are unable to continue as a going concern, we may have to reorganize or liquidate our business and may receive less than the value at which those assets are carried on our consolidated financial statements, and investors may lose all or a part of their investment. The board of directors (the "Board") has established a strategy committee to work with the Company and outside advisors in evaluating our options and considering alternatives that we believe will maximize stakeholder value, including any of the following or a combination thereof: debt financing, equity investments, combinations with other companies, or the sale of all or part of the company. There can be no assurances that any transactions will be completed and if we are not able to raise sufficient additional capital to fund our future operation, we may potentially seek relief available under applicable insolvency laws. We do not intend to make further announcements regarding this process unless and until the Board approves a specific transaction or otherwise determines that further disclosure is appropriate.

Comparison of the Three Months Ended June 30, 2024 and 2023

The following table sets forth our results of operations for the three months ended June 30, 2024 and 2023:

	Three Months Ended June 30,		Period-to-Period Change	
	2024	2023	$	%
Revenues:				
Product revenue	$ 6,510,000	$ 6,609,000	$ (99,000)	(1)%
Service and other revenue	1,261,000	2,053,000	(792,000)	(39)%
Total revenue	7,771,000	8,662,000	(891,000)	(10)%
Cost of revenue:				
Cost of product revenue	4,703,000	4,752,000	(49,000)	(1)%
Cost of service and other revenue	483,000	1,602,000	(1,119,000)	(70)%
Total cost of revenue	5,186,000	6,354,000	(1,168,000)	(18)%
Operating expenses:				
Research and development	6,831,000	14,610,000	(7,779,000)	(53)%
Selling, general and administrative	11,557,000	26,936,000	(15,379,000)	(57)%
Restructuring costs	1,215,000	—	1,215,000	100 %
Total operating expenses	19,603,000	41,546,000	(21,943,000)	(53)%
Loss from operations	(17,018,000)	(39,238,000)	22,220,000	(57)%
Other income (expenses):				
Interest income	457,000	689,000	(232,000)	(34)%
Other income (expenses)	363,000	(330,000)	693,000	(210)%
Total other income (expenses)	820,000	359,000	461,000	128 %
Loss before income taxes	(16,198,000)	(38,879,000)	22,681,000	(58)%
Provision for income taxes	(26,000)	(33,000)	7,000	(21)%
Net loss	$ (16,224,000)	$ (38,912,000)	$ 22,688,000	(58)%

Revenue

Product revenue decreased by $0.1 million, or 1%, to $6.5 million for the three months ended June 30, 2024 compared to $6.6 million for the same period in 2023. The decrease in product revenue was driven by a $0.2 million or 8% decrease in instrument revenue, a $0.4 million or 13% decrease in consumables revenue, and was partially offset by an increase of $0.5 million or 39% of software revenue. Despite decreased product revenue for the three months ended June 30, 2024, we expect product revenue to continue to increase as market awareness and published data of OGM utility increases, along with continued efficiencies gained in the OGM workflow through research and development.

Service and other revenue decreased by $0.8 million, or 39%, to $1.3 million for the three months ended June 30, 2024 when compared to the same period in 2023 which is the result of discontinuing sales of certain clinical service offerings from Bionano Laboratories effective March 2024. Such clinical service offerings from Bionano Laboratories contributed $0.7 million in revenues for the three months ended June 30, 2024. We expect service and other revenue to continue to decrease over the remainder of 2024 as a result of phasing out these offerings.

Cost of Revenue

Cost of product revenue decreased by 1%, to $4.7 million for the three months ended June 30, 2024, compared to $4.8 million for the three months ended June 30, 2023. The decrease in cost of product revenue was due to a shift in the product mix, with a lower contribution from instrument and consumable sales partially offset by increased contribution from software sales. We expect cost of product revenue to increase as product revenues increase.

Cost of service and other revenue decreased $1.1 million, or 70%, to $0.5 million for the three months ended June 30, 2024, compared to $1.6 million for the three months ended June 30, 2023. The decrease in cost of service and other revenue is primarily due to discontinuing sales of certain clinical service offerings from Bionano Laboratories effective March 2024. We expect cost of service and other revenue to decrease over the remainder of 2024 as a result of our decision to phase out certain clinical service offerings from Bionano Laboratories.

Gross Profit, and Gross Margin

	Three Months Ended June 30,		Period-to-Period Change	Period-to-Period Percentage Change
	2024	2023	2024 to 2023	2024 to 2023
Gross profit (loss):				
Product	$ 1,807,000	$ 1,857,000	$ (50,000)	(3)%
Service and other	778,000	451,000	327,000	73%
Total gross profit	$ 2,585,000	$ 2,308,000	$ 277,000	12%
Gross margin:				
Product	28 %	28 %		
Service and other	62 %	22 %		
Total gross margin	33 %	27 %		

Product gross profit decreased $0.1 million, or 3%, to $1.8 million for the three months ended June 30, 2024, compared to $1.9 million for the three months ended June 30, 2023. The decrease in product gross profit was due to the decrease in consumable sales partially offset by the increase in software sales.

Service and other gross profit increased by $0.3 million, or 73%, to $0.8 million for the three months ended June 30, 2024, compared to $0.5 million for the three months ended June 30, 2023. The increase in service and other gross profit was primarily due to the decrease in cost of sales related to discontinuing sales of certain clinical service offerings from Bionano Laboratories effective March 2024. We expect service and other gross profit to decrease over the remainder of 2024 as a result of our decision to phase out certain clinical service offerings from Bionano Laboratories.

Research and Development Expenses

Research and development (“R&D”) expenses decreased by $7.8 million, or 53%, to $6.8 million for the three months ended June 30, 2024 compared to $14.6 million for the same period in 2023. The decrease is partially due to decreases of $4.3 million in salaries, wages and benefits driven by headcount reductions announced throughout 2023 and 2024, and of $2.1 million in professional and consulting fees including costs incurred to support clinical research studies, Stratys development, foundry expenses, and cloud computing. We also reduced our consumption of inventory and materials and supply by $1.3 million of non-inventory materials and supply. We anticipate that R&D expenses will decrease for the remainder of 2024 as a result of our cost savings initiatives announced in March 2024.

Selling, General and Administrative Expenses

Selling, general and administrative (“SG&A”) expenses decreased by $15.4 million, or 57%, to $11.6 million for the three months ended June 30, 2024 compared to $26.9 million for the same period in 2023. The decrease is primarily due to a $6.0 million decrease in salaries, wages and benefits driven by headcount reductions announced throughout 2023 and 2024, a $2.7 million decrease in professional and consulting fees which is primarily marketing-related expenses and software maintenance, a $2.1 million decrease in administration and other expenses which includes the gain/loss recorded on fair value of the contingent consideration due for BioDiscovery and Purigen milestones, and $0.9 million decrease in travel entertainment. We anticipate that SG&A expenses will decrease for the remainder of 2024 as a result of our cost savings initiatives announced in March 2024.

Restructuring Costs

Restructuring costs were $1.2 million for the three months ended June 30, 2024, as a result of our cost savings initiatives announced in March 2024. We had no expenses that were classified as restructuring costs during the same period in 2023.

Interest Income

Interest income decreased by $0.2 million, or 34%, to $0.5 million for the three months ended June 30, 2024, as compared to $0.7 million for the same period in 2023 resulting from positive returns on investments. The decrease is the result of a reduction in investments offset by higher returns.

Other income (expense)

Other income (expense) increased by $0.7 million, or (210)%, to $0.4 million for the three months ended June 30, 2024 compared to $(0.3) million for the same period in 2023. The increase is driven by a net gain on the extinguishment of the High Trail Note and Purchase Option of $4.0 million, offset by a loss recorded on the issuance of the JGB Debentures of $1.9 million, and an increase in interest expense of $1.4 million. See Note 5 (Debt) for further discussion on debt transactions that took effect during the quarter.

Comparison of the Six Months Ended June 30, 2024 and 2023

The following table sets forth our results of operations for the six months ended June 30, 2024 and 2023:

	Six Months Ended June 30,		Period-to-Period Change	
	2024	2023	$	%
Revenues:				
Product revenue	$ 13,338,000	$ 12,056,000	$ 1,282,000	11 %
Service and other revenue	3,202,000	4,021,000	(819,000)	(20)%
Total revenue	16,540,000	16,077,000	463,000	3 %
Cost of revenue:				
Cost of product revenue	9,607,000	8,610,000	997,000	12 %
Cost of service and other revenue	1,525,000	3,090,000	(1,565,000)	(51)%
Total cost of revenue	11,132,000	11,700,000	(568,000)	(5)%
Operating expenses:				
Research and development	16,608,000	28,547,000	(11,939,000)	(42)%
Selling, general and administrative	31,092,000	52,913,000	(21,821,000)	(41)%
Restructuring costs	5,847,000	—	5,847,000	100 %
Total operating expenses	53,547,000	81,460,000	(27,913,000)	(34)%
Loss from operations	(48,139,000)	(77,083,000)	28,944,000	(38)%
Other income (expenses):				
Interest income	1,500,000	1,392,000	108,000	8 %
Other income (expenses)	(998,000)	(288,000)	(710,000)	247 %
Total other income (expenses)	502,000	1,104,000	(602,000)	(55)%
Loss before income taxes	(47,637,000)	(75,979,000)	28,342,000	(37)%
Provision for income taxes	(9,000)	(59,000)	50,000	(85)%
Net loss	$ (47,646,000)	$ (76,038,000)	$ 28,392,000	(37)%

Revenue

Product revenue increased by $1.3 million, or 11%, to $13.3 million for the six months ended June 30, 2024 compared to $12.1 million for the same period in 2023. The increase in product revenue was driven by a $0.8 million or 16% increase in sales of consumables and an increase of $0.9 million or 36% of software, partially offset by a $0.5 million or 11% decrease in instrument sales. We believe increased demand for our OGM systems was primarily driven by increased market awareness and additional published data demonstrating the utility of OGM. We expect product revenue to increase as market awareness and published data of OGM utility increases, along with continued efficiencies gained in the OGM workflow through research and development, and the acquisitions of BioDiscovery and Purigen.

Service and other revenue decreased $0.8 million or 20% for the six months ended June 30, 2024 when compared to the same period in 2023. We expect service and other revenue to continue to decrease over the remainder of 2024 as a result of our decision to phase out certain clinical service offerings from Bionano Laboratories.

Cost of Revenue

Cost of product revenue increased by $1.0 million, or 12%, to $9.6 million for the six months ended June 30, 2024, compared to $8.6 million for the same period in 2023. The increase in cost of product revenue was due to higher sales of consumables offset by lower sales of instruments. We expect cost of product revenue to continue to increase as product revenues increase.

Cost of service and other revenue decreased $1.6 million, or 51%, to $1.5 million for the six months ended June 30, 2024, compared to $3.1 million for the same period in 2023. The decrease in cost of service and other revenue is primarily due to discontinuing sales of certain clinical service offerings from Bionano Laboratories effective March 2024. We expect cost of service and other revenue to decrease over the remainder of 2024 as a result of our decision to phase out certain clinical service offerings from Bionano Laboratories.

Gross Profit, and Gross Margin

	Six Months Ended June 30,		Period-to-Period Change	Period-to-Period Percentage Change
	2024	2023	2024 to 2023	2024 to 2023
Gross profit (loss):				
Product	$ 3,731,000	$ 3,446,000	$ 285,000	8%
Service and other	1,677,000	931,000	746,000	80%
Total gross profit	$ 5,408,000	$ 4,377,000	$ 1,031,000	24%
Gross margin:				
Product	28 %	29 %		
Service and other	52 %	23 %		
Total gross margin	33 %	27 %		

Product gross profit increased $0.3 million, or 8%, to $3.7 million for the six months ended June 30, 2024, compared to $3.4 million for the same period in 2023. The increase in product gross profit was primarily due to higher sales of consumables and software, offset by a decrease in instrument sales.

Service and other gross profit increased by $0.7 million, or 80%, to $1.7 million for the six months ended June 30, 2024, compared to $0.9 million for the same period in 2023. The increase in service and other gross profit was primarily due to the decrease in cost of sales related to discontinuing sales of certain clinical service offerings from Bionano Laboratories effective March 2024. We expect service and other gross profit to decrease over the remainder of 2024 as a result of our decision to phase out certain clinical service offerings from Bionano Laboratories.

Research and Development Expenses

R&D expenses decreased by $11.9 million, or 42%, to $16.6 million for the six months ended June 30, 2024 compared to $28.5 million for the same period in 2023. The decrease is partially due to decreases of $6.5 million in salaries, wages and benefits driven by headcount reductions announced throughout 2023 and 2024 and $3.6 million in professional and consulting fees including costs incurred to support clinical research studies, Stratys development, foundry expenses, and cloud computing. Lastly, we reduced information technology and rent and facility costs by $0.6 million and we reduced the internal consumption of inventory and materials and supply by $1.1 million. We anticipate that R&D expenses will decrease for the remainder of 2024 as a result of our cost savings initiatives announced in March 2024.

Selling, General and Administrative Expenses

SG&A expenses decreased by $21.8 million, or 41%, to $31.1 million for the six months ended June 30, 2024 compared to $52.9 million for the same period in 2023. The decrease is primarily due to a $9.8 million decrease in salaries, wages and benefits driven by headcount reductions announced in 2023 and 2024, a $4.2 million decrease in primarily marketing-related expenses and a $2.9 million decrease in administration and other expenses which includes the gain/loss recorded on fair value of the contingent consideration due for Purigen and BioDiscovery milestones and is offset by intangible impairment charges recorded to our non-OGM Bionano Laboratories asset group. We anticipate that SG&A expenses will decrease for the remainder of 2024 as a result of our cost savings initiatives announced in March 2024.

Restructuring Costs

Restructuring costs were $5.8 million for the six months ended June 30, 2024, as a result of our cost savings initiatives announced in March 2024.We had no expenses that were classified as restructuring costs during the same period in 2023.

Interest Income

Interest income increased by $0.1 million, or 8%, to $1.5 million for the six months ended June 30, 2024, as compared to $1.4 million for the same period in 2023 resulting from positive returns on investments.

Other income (expense)

Other income (expense) increased by $0.7 million, or 247%, to $1.0 million for the six months ended June 30, 2024 compared to $0.3 million for the same period in 2023. The increase is driven by a net gain on the extinguishment of the High Trail Note and Purchase Option of $4.0 million, offset by a loss recorded on the issuance of the JGB Debentures of $1.9 million, and an increase in interest expense of $1.5 million. See Note 5 (Debt) for further discussion on debt transactions that took effect during the quarter.

Liquidity and Capital Resources

Since our inception, we have incurred recurring net losses from operations, negative cash flows from operating activities and accumulated deficit. We have primarily generated cash flows from sales of equity securities and debt financings. We incurred net losses of $47.6 million and $76.0 million for the six months ended June 30, 2024 and 2023, respectively. As of June 30, 2024, we had an accumulated deficit of $628.9 million, cash and cash equivalents of $10.4 million, $11.4 million in restricted cash and short-term investment securities of $8.5 million. The amount we are required to hold as restricted cash is equal to the lesser of (a) $11.0 million and (b) the then outstanding principal balance of the Debentures.

Sources of Liquidity and Capital Resources

In the six months ended June 30, 2024, we incurred negative cash flows from operating activities of $49.1 million. We anticipate that future sources of liquidity will principally come from sales of common stock and other equity instruments, borrowings from credit facilities and revenue from our commercial operations. Revenue from our commercial operations has increased due to increased demand for our product offerings and our acquisition of BioDiscovery and Purigen. See Note 6 (Stockholder's Equity and Stock-Based Compensation) to our unaudited condensed consolidated financial statements included elsewhere in this Quarterly Report for a discussion of our recent equity activity for more information.

On October 13, 2023, we completed a registered offering (the "October 2023 Registered Offering") of senior secured convertible notes payable due 2025 (the "High Trail Registered Notes") and warrants (the "Registered Warrants") and a concurrent private placement (the "October 2023 Private Placement" and together with the October 2023 Registered Offering, the "October 2023 Offering") of senior secured convertible notes payable due 2025 (the "High Trail Private Placement Notes" and, together with the High Trail Registered Notes, the "High Trail Notes") and warrants (the "Private Placement Warrants" and, together with the Registered Warrants, the "Warrants") and received net proceeds from the sale of the High Trail Notes and the Registered Warrants of approximately $75.6 million, after deducting the offering expenses and placement agent fees.

On February 27, 2024, we entered into a letter agreement (the "Letter Agreement") and an Amendment to the Registered Notes (the "Amendment"), with the purchaser of the High Trail Registered Notes which provided reduction (i) of the minimum liquidity covenant from $50.0 million, and (ii) of the restricted cash covenant from $35.0 million, to the amount equal to the sum of (iii) the outstanding principal amount of the High Trail Registered Notes plus (iv) approximately $0.7 million, which will be further reduced as the remaining principal on the High Trail Registered Notes are retired. We also redeemed the outstanding $17.0 million of the High Trail Private Placement Notes for a redemption payment of approximately $19.6 million and a retirement fee of $3.2 million paid concurrently and $10.7 million of the High Trail Registered Notes for a redemption payment of approximately $12.3 million.

On March 1, 2024, we redeemed $27.7 million aggregate principal amount of the High Trail Notes at a redemption price of 115% of the outstanding principal (the "Repayment Price") or $31.8 million, and for the period January 1, 2024 through May 1, 2024, redeemed an additional $18.0 million aggregate principal amount of the High Trail Notes at the holders' option at the Repayment Price for an aggregate of $20.7 million.

On May 24, 2024, we entered into a securities purchase agreement with certain accredited investors (the "Holders") and JGB Collateral LLC, as collateral agent for the Holders, for the sale by the Company in a private placement (the "JGB Debentures Offering") of:

- 2.25 million shares (the "Shares") of the Company's common stock, par value $0.0001 per share ("Common Stock"), and
- Senior Secured Convertible Debentures in the aggregate principal amount of $20.0 million (the "Debentures"), for an aggregate purchase price of $18.0 million.

The closing of the JGB Debentures Offering occurred on May 24, 2024. In connection with the closing of the JGB Debentures Offering, the Company received net proceeds of approximately $16.6 million, after payment of placement agent fees, and other offering expenses. The Company used the proceeds received to fully redeem the outstanding balance due under the High Trail Note of approximately $17.6 million, as amended (see further discussion below).

On May 23, 2024, in connection with the JGB Debentures Offering, the Company entered into a redemption agreement with High Trail ("HT Agreement"). Pursuant to the HT Agreement, the Company agreed to redeem the entire outstanding principal amount of $15.3 million under the High Trail Note at a redemption price of 115% for a total redemption payment of $17.6 million (the "Redemption Payment"). Upon High Trail's receipt of the Redemption Payment on May 24, 2024, the High Trail Note and related Option were cancelled. In addition, the Company agreed to pay High Trail a retirement fee of $2.2 million and to reimburse High Trail for all of its reasonable and documented out-of-pocket expenses incurred with the release and termination of security interests relating to the High Trail Note.

As of June 30, 2024, the Company reported $19.4 million of Debentures at fair value, of which $19.4 million is classified as current and represents twelve months' principal redemption payments at the holder's option. Through June 30, 2024, the Company paid $0.2 million in interest and no principal amounts on the Debentures. As of June 30, 2024, the Company may be required to redeem up to $6.0 million of principal and expects to pay an additional $1.4 million in interest on the Debentures in 2024.

See Note 5 (Debt) to our unaudited condensed consolidated financial statements included elsewhere in this Quarterly Report for further information on the Notes and Warrants.

On April 4, 2024, we entered into a securities purchase agreement (the "April Purchase Agreement") with certain institutional investors, pursuant to which we agreed to issue and sell, in a registered direct offering priced at-the-market consistent with the rules of the Nasdaq Stock Market (the "April 2024 Registered Direct Offering"): (i) an aggregate of 6.5 million shares of common stock, (ii) pre-funded warrants to purchase up to an aggregate of 2.2 million shares of common stock and (iii) warrants to purchase up to 8.7 million shares of common stock. The combined purchase price of each share of common Stock and accompanying warrant was $1.15 per share. The combined purchase price of each pre-funded warrant and accompanying warrant was $1.14 (equal to the combined purchase price per share of common stock and accompanying warrant, minus $0.001). We received gross proceeds from the April 2024 Registered Direct Offering of approximately $10.0 million, before deducting placement agent fees and other offering expenses of $0.7 million.

On July 4, 2024, we entered into a securities purchase agreement (the "July 2024 Purchase Agreement") with certain institutional investors, pursuant to which we agreed to issue and sell, (i) in a registered direct offering priced at-the-market consistent with the rules of the Nasdaq Stock Market (the "July 2024 Registered Direct Offering"): (a) an aggregate of 11.7 million shares of our common stock, and (b) pre-funded warrants to purchase up to an aggregate of 5.8 million shares of Common Stock, and (ii) in a concurrent private placement (the "Private Placement" and together with the Registered Direct Offering, the "July 2024 Offering"), Series A warrants to purchase up to an aggregate of 17.5 million shares of Common Stock (the "Series A Warrants") and Series B warrants to purchase up to an aggregate of 17.5 million shares of Common Stock (the "Series B Warrants", and together with the Series A Warrants, the "Purchase Warrants"). Each share of Common Stock and each Pre-Funded Warrant sold pursuant to the Purchase Agreement will be accompanied by one Series A Warrant and one Series B Warrant. The combined purchase price of each share of Common Stock and accompanying Purchase Warrants is $0.571 per share. The combined purchase price of each Pre-Funded Warrant and accompanying Purchase Warrants is $0.571 (equal to the combined purchase price per share of Common Stock and accompanying Purchase Warrants, minus $0.001). We received gross proceeds from the July 2024 Offering of approximately $10.0 million (excluding up to $20.0 million of aggregate gross proceeds that may be received in the future upon the cash exercise of the Purchase Warrants issued in the Private Placement which is contingent upon stockholder approval), before deducting placement agent fees and other offering expenses of $0.7 million.

Based on our current business plans, we believe the net proceeds from the financings above together with our existing cash and cash equivalents and short-term investments, will be sufficient to fund our operating expenses and capital expenditure requirements into the fourth quarter of 2024. This estimate assumes the inclusion of the amount equal to the outstanding principal amount of the Debentures. Our existing cash and cash equivalents and short-term investments, will not be sufficient for us to achieve cash-flow break even and we expect to need to seek additional capital based on strategic consideration alternatives in the future.

Future Capital Requirements

We expect that our near and longer-term liquidity requirements will consist of working capital and general corporate expenses associated with the growth of our business, including, without limitation, expenses associated with scaling up our operations and continuing to increase our manufacturing capacity, sales and marketing expense, increasing market awareness of our products and services to target customers, instrument placements with customers via the reagent rental sales strategy, additional research and development expenses associated with expanding and proving the utility of our offerings, expenses associated with continuing to build out our corporate infrastructure, enhancements to information technology, and expenses associated with being a public company. We expect such expenditures to continue throughout 2024.

We had $10.4 million in cash and cash equivalents, $8.5 million in short-term investments and $11.4 million in restricted cash as of June 30, 2024. The amount we are required to hold as restricted cash is equal to the lesser of (a) $11.0 million and (b) the then outstanding principal balance of the Debentures. Based on recurring losses from operations incurred since inception and the expectation of continued operating losses, we anticipate our available cash balance will not be sufficient to operate our business for the next twelve months from the issuance of this Quarterly Report. Accordingly, we determined that there is substantial doubt about our ability to continue as a going concern within 12 months after the date that the financial statements included in this Quarterly Report are issued. In order to continue to operate our business beyond that time, we will need to raise substantial additional capital. We are actively evaluating debt and equity financing sources available to us as well as cost reduction strategies, but there can be no assurance that financing will be available on terms acceptable to us, on a timely basis, or at all, or that we are able to effectively reduce our operating expenses. To the extent that we raise additional capital through the sale of equity or convertible debt securities, the ownership interest of our stockholders will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect the rights of common stockholders. Debt financing and preferred equity financing, if available, may involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making acquisitions or capital expenditures or declaring dividends. Any disruptions to, or volatility in, the credit and financial markets or any deterioration in overall economic conditions may make any necessary debt or equity financing more difficult to obtain, more costly and/or more dilutive. If we are unable to raise additional funds through debt or equity financing or other arrangements when needed, we may be required to delay, limit, reduce or terminate our research and development activities or future commercialization efforts. Even if we raise additional capital, we may also be required to modify, delay or abandon some of our plans which could have a material adverse effect on our business, operating results and financial condition and our ability to achieve our intended business objectives.

In addition, our estimate as to the sufficiency of our current cash, cash equivalents and short-term investments and our current operating plan as discussed above are based on assumptions that may prove to be wrong, and we could deplete our capital resources sooner than we currently anticipate. See Note 1 (Organization and Basis of Presentation) to our unaudited condensed consolidated financial statements included elsewhere in this Quarterly Report for more information.

Cash Flows

The following table sets forth the cash flow from operating, investing and financing activities for the periods presented:

	Six Months Ended June 30,	
	2024	**2023**
Net cash provided by (used in):		
Operating activities	$ (49,109,000)	$ (69,109,000)
Investing activities	76,217,000	46,104,000
Financing activities	(23,596,000)	32,743,000

Operating Activities

We derive cash flows from operations primarily from the sale of our products and services. Our cash flows from operating activities are also significantly influenced by our use of cash for operating expenses to support our business. We have historically experienced negative cash flows from operating activities as we have developed our technology, expanded our business and built our infrastructure, and this may continue in the future. As discussed above, we anticipate our available cash balance will not be sufficient for the next twelve months from the issuance of this report. We plan to raise additional capital to fulfill our operating and capital requirements for at least 12 months through equity or debt financings, however, we may not be able to secure such financing in a timely manner or on favorable terms, if it all. See Note 5 (Debt) to our unaudited condensed consolidated financial statements included elsewhere in this Quarterly Report for a discussion of our recent debt financing. We anticipate that our cash used in operating activities will decrease over the next 12 to 24 months; however, we may observe fluctuations in the cash used in operating activities on a quarterly basis to sustain the expansion of our commercial offerings.

Net cash used in operating activities was $49.1 million during the six months ended June 30, 2024 as compared to $69.1 million during the same period in 2023. The decrease in cash used in operating activities of $20.0 million was primarily attributed to a decrease in our net loss in the current quarter and decrease in our working capital usage as a result of our cost savings initiatives announced in March 2024.

Investing Activities

Historically, our primary investing activities have consisted of capital expenditures for the purchase of capital equipment to support our expanding infrastructure, as well as the acquisitions of Lineagen, BioDiscovery and Purigen to grow our business. We expect to continue to incur additional costs for capital expenditures related to these efforts in future periods. During the six months ended June 30, 2024, cash provided by investing activities was $76.2 million, as compared to $46.1 million provided by

investing activities during the same period in 2023. The increase in cash provided by investing activities of $30.1 million was primarily attributed to the maturity of $227.9 million in available for sale securities which was offset by a purchase of available for sale securities of $151.6 million during the six months ended June 30, 2024, compared to the maturity of $46.9 million in available for sale securities during the same period in 2023.

Financing Activities

Net cash used in financing activities was $23.6 million during the six months ended June 30, 2024 as compared to net cash provided by financing activities of $32.7 million during the same period in 2023, a decrease of $56.3 million. During the six months ended June 30, 2024, the Company made payments of $61.0 million towards the convertible notes payable which was offset by approximately $18.0 million in gross proceeds from the issuance of convertible debentures and $27.6 million in gross proceeds from executing sales under our at-the-market facility with Cowen and Company, LLC ("Cowen") as compared to $33.5 million during the same period in 2023.

Capital Resources

As of June 30, 2024, we had approximately $10.4 million in cash and cash equivalents, short-term investments of $8.5 million, $11.4 million in restricted cash and working capital of $23.4 million. The amount we are required to hold as restricted cash is equal to the lesser of (a) $11.0 million and (b) the then outstanding principal balance of the Debentures.

We have in place a Sales Agreement with Cowen (the "Cowen ATM"), as amended, pursuant to which we may offer and sell from time to time up to $200.0 million of shares from the date of the amendment going forward through or to Cowen, acting as sales agent or principal. During the six months ended June 30, 2024, we sold approximately 14.0 million shares of common stock under the Cowen ATM and received gross proceeds of approximately $17.6 million before deducting offering costs of $0.4 million.

Contingent Consideration

As part of the merger agreement related to the acquisition of Purigen, we agreed to pay two independent milestone payments up to an aggregate of $32.0 million.

The fair value of the Purigen milestones is reassessed on a quarterly basis using a probability weighted model and a Monte Carlo Simulation. We determined the fair value of the milestone consideration using a scenario-based technique, as the trigger for payment is event driven. At June 30, 2024, we determined the likelihood of the first milestone to be 0% and reduced the fair value of the contingent consideration accordingly. For the second milestone, we performed a Monte Carlo Simulation to determine the likelihood that the milestone will be achieved and was applied to the milestone consideration payment.

Based on these valuation assumptions, the fair value of the contingent consideration liabilities was determined to be $5.8 million as of June 30, 2024.

Contractual Obligations

There were no material changes to our contractual obligations from those disclosed in the Company's Annual Report.

Critical Accounting Policies and Estimates

Our management's discussion and analysis of our financial condition and results of operations is based on our unaudited condensed consolidated financial statements, which have been prepared in accordance with generally accepted accounting principles in the United States. These accounting principles require us to make certain estimates, judgments and assumptions that affect the reported amounts of assets and liabilities as of the date of the unaudited condensed consolidated financial statements, as well as the reported amounts of revenues and expenses during the periods presented. We have discussed the development, selection and disclosure of the accounting estimates with our audit committee. We believe that the estimates, judgments and assumptions are reasonable based upon information available to us at the time that these estimates, judgments and assumptions are made. To the extent there are material differences between these estimates, judgments or assumptions and actual results, our financial statements will be affected. Historically, revisions to our estimates have not resulted in a material change to our financial statements.

Change in Accounting Estimates

The Company reviews the estimated useful life of its fixed assets on an ongoing basis. This review indicated that the actual lives of the Company's Saphyr and Stratys instruments were longer than the estimated useful lives used for depreciation purposes in the Company's unaudited condensed consolidated financial statements. We first assessed several qualitative and quantitative factors as part of our review including an analysis of the product life cycle, continued product support, customer commitments, technical durability, and compatibility of the Company's Saphyr and Stratys instruments.

As described further in Note 1, (Organization and Basis of Presentation) to our unaudited condensed consolidated financial statements included elsewhere in this Quarterly Report, effective January 1, 2024, the Company changed its estimates of the useful lives of the Company's Saphyr and Stratys instruments to better reflect the estimated period during which these assets will remain in service.

During the six months ended June 30, 2024, there have been no changes to our critical accounting policies and estimates as described in our Annual Report.

Recent Accounting Pronouncements

See Note 1 (Organization and Basis of Presentation) to our unaudited condensed consolidated financial statements included elsewhere in this Quarterly Report for information concerning recent accounting pronouncements.

ITEM 3. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

We have operations both within the United States and internationally, and we are exposed to market risks in the ordinary course of business. These risks primarily relate to interest rates, foreign currency exchange rates and inflation.

Interest Rate Risk

We had approximately $10.4 million in cash and cash equivalents, $8.5 million in short-term investments and $11.4 million in restricted cash as of June 30, 2024, which include highly liquid, investment grade debt securities. Such interest-bearing instruments are exposed to a certain degree of interest rate risk. The primary objective of our investment activities is to preserve principal while at the same time maximizing yields without significantly increasing risk. We do not enter into investments for trading or speculative purposes and have not used any derivative financial instruments to manage our interest rate risk exposure. To achieve this objective, we invest in highly liquid and high-quality government and other debt securities. To minimize our exposure due to adverse shifts in interest rates, we invest primarily in short-term securities. The amount we are required to hold as restricted cash is equal to the lesser of (a) $11.0 million and (b) the then outstanding principal balance of the Debentures.

Although we are seeing, and expect to continue to see, increased interest rates, due to our investment in highly liquid and high quality government and other debt securities as well as short-term securities, as of the date of this Quarterly Report on Form 10-Q, we do not expect anticipated changes in interest rates to have a material effect on our interest rate risk in future reporting periods. Due to the short holding period of our investments and the nature of our investments, a hypothetical change of 100 basis points would have an immaterial impact on our investments.

Our liabilities for acquisition-related contingent consideration, which is adjusted to fair value each reporting period, is also impacted by changes in interest rates. The risk-free interest rate used to estimate our weighted average cost of capital is a component of the discount rate used to calculate the present value of future cash flows due upon the achievement of certain milestones. As a result, any changes in the underlying risk-free interest rate could result in material changes to the fair value of such liabilities and could materially impact the amount of non-cash expense (or income) recorded each reporting period. As a consequence of the U.S. Federal Reserve raising interest rates, the underlying risk-free interest rate we use for purposes of calculating fair value of our liabilities for acquisition-related contingent consideration has increased from our prior reporting periods, but such increase did not have a material impact on our financial statements, and we currently do not expect anticipated future changes to have a material effect in future reporting periods.

Foreign Currency Exchange Rate Risk

We conduct a portion of our business in currencies other than our U.S. dollar functional currency. Transactional exposure arises where transactions occur in currencies other than the functional currency. Transactions in foreign currencies are recorded at the exchange rate prevailing at the date of the transaction. The resulting monetary assets and liabilities are translated into the appropriate functional currency at exchange rates prevailing at the balance sheet date and the resulting gains and losses are reported in foreign currency translation adjustments in the unaudited condensed consolidated statements of comprehensive loss. Our foreign currency exposures are primarily concentrated in the British Pound, Chinese Renminbi, Euro, and Canadian dollar. We do not currently participate in material foreign exchange hedging activities.

Additionally, we have operations outside of the United States. The functional currency of each foreign subsidiary is generally the local currency. We are exposed to foreign currency exchange risk as the functional currency financial statements of foreign subsidiaries are translated to U.S. dollars. The assets and liabilities of our foreign subsidiaries having a functional currency other than the U.S. dollar are translated into U.S. dollars at the exchange rate prevailing at the balance sheet date, and at the average exchange rate for the reporting period for revenue and expense accounts. The cumulative foreign currency translation

adjustment is recorded as a component of accumulated other comprehensive loss in shareholders' equity. The reported results of our foreign subsidiaries will be influenced by their translation into U.S. dollars by currency movements against the U.S. dollar. As of June 30, 2024 and December 31, 2023, we had minimal assets and liabilities denominated in foreign currencies and expect similar levels of foreign currency denomination in the next 12 months. We believe a hypothetical 10% change in foreign exchange rates as of June 30, 2024 would not have a material impact on our business, financial condition, or results of operations.

Inflation

Geopolitical and macroeconomic events, including the conflict between Ukraine and Russia and related sanctions and the recent and potential future disruptions in access to bank deposits or lending commitments due to bank failures have contributed to supply chain challenges, which we believe have resulted in inflation headwinds, particularly increased logistical costs and raw material prices. In prior periods, we experienced increased costs to secure certain component parts in our products and to produce our products at our contract manufacturers. However we do not believe that inflation has had a material effect on our business, financial condition or results of operations, other than its impact on the general economy, as our cost of revenue for the three and six months ended June 30, 2024 was not significantly impacted by the cost increases we experienced. While the effects of geopolitical and macroeconomic events, as well as other inflationary pressures, are highly uncertain, as of the date of this Quarterly Report on Form 10-Q, we do not expect anticipated changes in inflation to have a material effect on our business, financial condition or results of operations for future reporting periods other than the general impacts on companies due to general economic and market conditions. If our costs were to become subject to significant inflationary pressures, we may not be able to fully offset such higher costs through price increases. Our inability or failure to do so could harm our business, financial condition or results of operations.

ITEM 4. CONTROLS AND PROCEDURES

Evaluation of Disclosure Controls and Procedures

We maintain "disclosure controls and procedures," as defined in Rule 13a-15(e) and Rule 15d-15(e) under the Exchange Act. Disclosure controls and procedures are controls and other procedures designed to ensure that the information required to be disclosed by us in the reports that we file or submit under the Exchange Act is recorded, processed, summarized, and reported within the time periods specified in the SEC's rules and forms. Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed by us in the reports that we file or submit under the Exchange Act is accumulated and communicated to our management, including our principal executive officer and our principal financial officer, or persons performing similar functions, as appropriate to allow timely decisions regarding required disclosure.

As of June 30, 2024, our management, with the participation of our principal executive officer and principal financial officer, evaluated the effectiveness of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act). Our management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives, and management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures. Based on this assessment, our management, including our principal executive officer and principal financial officer, has concluded that our disclosure controls and procedures were effective as of the end of the period covered by this Quarterly Report.

Changes in Internal Control over Financial Reporting

Under the supervision and with the participation of our management, including our principal executive officer and our principal financial officer, we carried out an evaluation of any potential changes in our internal control over financial reporting during the fiscal quarter covered by this Quarterly Report. There were no changes in our internal control over financial reporting during the quarter ended June 30, 2024 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

None.

ITEM 1A. RISK FACTORS

RISK FACTOR SUMMARY

Below is a summary of the principal factors that make an investment in our securities speculative or risky. This summary does not address all of the risks that we face. Additional discussion of the risks and uncertainties summarized in this risk factor summary, and other risks and uncertainties that we face, are set forth below under the heading "Risk Factors" and should be carefully considered, together with other information in this Quarterly Report and our other filings with the SEC before making investment decisions regarding our securities.

- We have incurred recurring net losses since we were formed and expect to incur losses in the future. We cannot be certain that we will ever achieve or sustain profitability;
- Our recurring losses, negative cash flows and significant accumulated deficit have raised substantial doubt regarding our ability to continue as a going concern;
- We are an early commercial-stage company and have a limited commercial history, which may make it difficult to evaluate our current business and predict our future performance;
- Our quarterly and annual operating results and cash flows have fluctuated in the past and might continue to fluctuate, which makes our future operating results difficult to predict and could cause the market price of our securities to decline substantially;
- Our future capital needs are uncertain and we may require additional funding in the future to advance the commercialization of our OGM systems, Ionic Purification system, VIA software, and our other products, technologies and services, as well as continue our research and development efforts. If we fail to obtain additional funding, we will be forced to delay, reduce or eliminate our commercialization and development efforts and there is substantial doubt about our ability to continue as a going concern;
- The terms of the Debentures and the Debenture Purchase Agreement restrict our current and future operations. Upon an event of default under the Debentures, we may not be able to make any accelerated payments under the Debentures or our other permitted indebtedness;
- Unfavorable geopolitical and macroeconomic developments could adversely affect our business, financial condition or results of operations;
- Acquisitions, joint ventures and other strategic transactions could disrupt or otherwise harm our business and may cause dilution to our stockholders;
- If our products or technologies fail to achieve and sustain sufficient market acceptance, our revenue will be adversely affected;
- In the near term, sales of our OGM systems, Ionic Purification system, VIA software, consumables and genome analysis services will depend on levels of research and development spending by clinical research laboratories, academic and governmental research institutions and biopharmaceutical companies, a reduction in which could limit demand for our technologies and products and adversely affect our business and operating results;
- If we do not successfully manage the development and launch of new products and technologies, our financial results could be adversely affected;
- Our future success is dependent upon our ability to further penetrate our existing customer base, attract new customers and retain the customers of our acquired businesses;
- The size of the markets for our products and technologies may be smaller than we estimate, and new markets may not develop as quickly as we expect, or at all, limiting our ability to successfully sell our products and technologies.
- We are currently limited to "research use only," or RUO, with respect to many of the materials and components used in our consumable products including our assays;
- We are subject to stringent and evolving U.S. and foreign laws, regulations, and rules, contractual obligations, industry standards, policies and other obligations related to data privacy and security. Our actual or perceived failure to comply with such obligations could lead to regulatory investigations or actions; litigation (including class claims) and mass arbitration demands; fines and penalties; disruption of our business operations; reputational harm; loss of revenue or profits; loss of customers or sales; and other adverse business consequences;
- If the U.S. Food and Drug Administration, or FDA, ends enforcement discretion for Laboratory Developed Tests or determines that our RUO products are medical devices or if we seek to market our RUO products for clinical diagnostic or health screening use, we or our collaborators or customers will be required to obtain regulatory clearance(s) or approval(s), and we may be required to cease or limit sales of our then marketed products, which could

materially and adversely affect our business, financial condition and results of operations. Any such regulatory process would be expensive, time-consuming and uncertain both in timing and in outcome;

- If we are unable to protect our intellectual property, it may reduce our ability to maintain any technological or competitive advantage over our competitors and potential competitors, and our business may be harmed;
- We have rights in some intellectual property that has been discovered through government funded programs and thus is subject to federal regulations such as "march-in" rights, certain reporting requirements, and a preference for U.S. industry. Compliance with such regulations may limit our exclusive rights, subject us to expenditure of resources with respect to reporting requirements, and limit our ability to contract with non-U.S. manufacturers;
- We depend on technology that is licensed to us by third parties. Any loss of our rights to these technologies could prevent us from selling our products;
- If we are unable to maintain our listing on the Nasdaq Capital Market or if we are unable to transfer our listing to another stock market our ability to publicly or privately sell equity securities and the liquidity of our common stock could be adversely affected; and
- The price of our securities has been and may in the future be volatile or may decline regardless of our operating performance, and you could lose all or part of your investment.

RISK FACTORS

Investing in our common stock involves a high degree of risk. You should consider and read carefully all of the risks and uncertainties described below, as well as other information included in this Quarterly Report, including our unaudited financial statements and related notes and our other filings with the SEC, before making investment decisions regarding our securities. The occurrence of any of the following risks could harm our business, financial condition, results of operations and/or growth prospects or cause our actual results to differ materially from those contained in forward-looking statements we have made in this report and those we may make from time to time. The risks described below are not the only risks facing our company. Additional risks and uncertainties not currently known to us or that we currently deem to be immaterial also may materially adversely affect our business, financial condition or future results.

Risks related to our financial condition and need for additional capital

We have incurred recurring net losses since we were formed and expect to incur losses in the future. We cannot be certain that we will ever achieve or sustain profitability.

Since our inception, we have incurred recurring net losses and we expect that our losses will continue for the foreseeable future. We incurred net losses of $47.6 million and $76.0 million, and used cash in operations of $49.1 million and $69.1 million for the six months ended June 30, 2024 and 2023, respectively. As of June 30, 2024, we had an accumulated deficit of $628.9 million. We cannot predict if we will be profitable in the near future or at all. Our past acquisitions have increased our expenses and we expect that any future acquisitions of businesses, assets, products or technologies would further increase our expenses, which may result in additional losses. We also expect significant increases in our stock-based compensation expense in future periods, reflecting higher stock option valuations as a public company and the issuance of additional equity awards. In addition, we incur significant legal, accounting and other expenses as a result of being a public company, especially as we no longer qualify as an emerging growth company and are therefore required to comply with additional disclosure and compliance requirements. These factors, among others, will make it hard for us to achieve and sustain profitability. We may also incur significant losses in the future for a number of other reasons, many of which are beyond our control, including the level of market acceptance of our products, the introduction of competitive products and technologies, our future product development efforts, our market penetration and our margins, as well as the other risks described below.

Our recurring losses, negative cash flows and significant accumulated deficit have raised substantial doubt regarding our ability to continue as a going concern.

Since inception, we have experienced recurring operating losses and negative cash flows from operating activities, and have significant accumulated deficit. We expect to continue to generate operating losses and consume significant cash resources for the foreseeable future. We believe that with receipt of the net proceeds in July 2024 from the July 2024 Offering and in May 2024 from the transaction pursuant to that certain securities purchase agreement dated May 24, 2024, between us and certain accredited investors and JGB Collateral LLC, as collateral agent for the investors (the "JGB Purchase Agreement") and restructuring of redemption terms for our debt instruments, together with the Company's existing cash and, cash equivalents and short-term investments, and after taking into account inaccessible "restricted cash" under the terms of the transaction under the JGB Purchase Agreement, based on the Company's current business plans we will be able to fund our operating expenses and capital expenditure requirements into the fourth quarter of 2024. See Note 5 and 6 (Debt and Stockholders' Equity and Stock-Based Compensation) to our unaudited condensed consolidated financial statements included elsewhere in this Quarterly Report for a further discussion of our recent debt and equity financings. Our existing cash and cash equivalents and short-term investments, will not be sufficient for us to achieve cash-flow break even and we expect to need to seek additional capital based on favorable market conditions or strategic considerations alternatives in the future. Without additional financing, these conditions raise substantial doubt about our ability to continue as a going concern, meaning that we may be unable to continue operations for the foreseeable future or realize assets and discharge liabilities in the ordinary course of operations. As a result, our financial statements include an explanatory paragraph expressing substantial doubt about our ability to continue as a going concern. We will continue to seek to raise additional capital, but without additional financing we may not be able to continue as a going concern, we may have to reorganize or liquidate our business and may receive less than the value at which those assets are carried on our consolidated financial statements, and investors may lose all or a part of their investment. If we seek additional financing to fund our business activities in the future and there remains doubt about our ability to continue as a going concern, investors or other financing sources may be unwilling to provide additional funding on commercially reasonable terms or at all. The Board has established a strategy committee to work with the Company and outside advisors in evaluating our options and considering alternatives that we believe will maximize stakeholder value, including any of the following or a combination thereof: debt financing, equity investments, combinations with other companies, or the sale of all or part of the company. There can be no assurances that any transactions will be completed and if we are not able to raise sufficient additional capital to fund our future operations, we may potentially seek relief available under applicable insolvency laws. We do not intend to make further announcements regarding this process unless and until the Board approves a specific transaction or otherwise determines that further disclosure is appropriate.

We are an early commercial-stage company and have a limited commercial history, which may make it difficult to evaluate our current business and predict our future performance.

We are an early commercial-stage company and have a limited commercial history. Our limited commercial history may make it difficult to evaluate our current business and, especially when combined with the other risk factors listed in this section, makes predictions about our future success or viability subject to significant uncertainty. For example, in recent years we significantly grew our headcount through acquisitions of other businesses and, the expansion of our sales, marketing and research and development teams, and, more recently, have undertaken several rounds of reductions to our work force and the discontinuation of certain product offerings, all of which have resulted in significant fluctuations in our operating costs in a manner not historically reflected in our consolidated financial statements. Because our business model has evolved over time and may continue to evolve, this has impacted the composition and concentration of our revenues, and which may continue to change in the future. These changes in revenue and expenses, among others, may make it difficult to evaluate our current business, assess our future performance relative to prior performance and accurately predict our future performance. We have encountered in the past, and will continue to encounter in the future, risks and difficulties frequently experienced by early commercial-stage companies, including those associated with scaling up our infrastructure, increasing and decreasing the size of our organization, integrating acquired businesses and implementing cost savings initiatives. If we do not address these risks successfully, or if our assumptions regarding these risks and uncertainties are incorrect or change over time, our results of operations could differ materially from our expectations and our business, financial condition and results of operations could be materially and adversely affected.

Our quarterly and annual operating results and cash flows have fluctuated in the past and might continue to fluctuate, which makes our future operating results difficult to predict and could cause the market price of our securities to decline substantially.

Numerous factors, many of which are outside our control, may cause or contribute to significant fluctuations in our quarterly and annual operating results. These fluctuations may make financial planning and forecasting uncertain and may result in unanticipated decreases in our available cash, which could negatively affect our business and prospects. In addition, one or more of such factors may cause our revenue or operating expenses in one period to be disproportionately higher or lower relative to the other periods. As a result, comparing our operating results on a period-to-period basis might not be meaningful. You should not rely on our past results as indicative of our future performance. Moreover, our stock price might be based on expectations of future performance that are unrealistic or that we might not meet and, if our revenue or operating results fall below the expectations of investors or securities analysts, the price of our securities could decline substantially.

Our operating results have varied in the past. In addition to other risk factors listed in this section, some of the important factors that, alone or together, may cause fluctuations in our quarterly and annual operating results include:

- adoption of our OGM solutions on our OGM systems, Ionic Purification system or successor systems;
- our successful creation of an end-to-end solution for OGM;
- execution on our commercial and reimbursement strategy involving Bionano Laboratories;
- customer demand for our software solutions, including VIA software, and future software solutions developed through this platform;
- the position of our DNA isolation business in genome analysis space and customer demand for our Ionic Purification system;
- the timing of customer orders and payments and our ability to recognize revenue;
- the rate of utilization of consumables by our customers;
- reductions in or other difficulties relating to staffing, capacity, shutdowns or slowdowns of laboratories and other institutions in our customer base, such as reduced or delayed investment in new technologies or spending on products, technologies or consumables;
- differences in purchasing patterns across our customer base, including potential differences in consumables spending between earlier adopters of our technologies and more recent customers and variances in rates of increase of consumables spending following new technology purchases;
- geopolitical and macroeconomic developments, such as the conflict between Ukraine and Russia and related sanctions, conflicts in the Middle East, potential future disruptions in access to bank deposits or lending commitments due to bank failures, global pandemics, inflation, increased cost of goods, supply chain issues, and global financial market conditions;
- our ability to successfully integrate new personnel, technology and other assets that we may acquire into our company;

- any cost saving and restructuring initiatives and our ability to successfully maintain our business operations and customer support at historic levels;
- the timing of the introduction of new systems, products, technologies, system and product enhancements and services;
- changes in governmental funding of life sciences research and development or other changes that impact budgets, budget cycles or seasonal or other spending patterns of our customers;
- future accounting pronouncements or changes in our accounting policies; and
- the outcome of any current or future litigation or governmental investigations involving us or other third parties with whom we do business.

In addition, a significant portion of our operating expenses are relatively fixed in nature, including our existing and acquired leases, and planned expenditures are based in part on expectations regarding future revenue. Accordingly, unexpected revenue shortfalls could decrease our gross margins and cause significant changes in our operating results from quarter to quarter. If this occurs, the trading price of our securities could fall substantially. This variability and unpredictability caused by factors such as those described above and elsewhere in this section could also result in our failing to meet the expectations of industry or financial analysts or investors for any period. If our revenue or operating results fall below the expectations of analysts or investors or below any guidance we may provide, or if the guidance we provide is below the expectations of analysts or investors, the price of our securities could decline substantially. Such a stock price decline could occur even when we have met or exceeded any previously publicly stated guidance or expectations.

If we are unable to maintain adequate revenue growth or do not successfully manage such growth, our business and growth prospects will be harmed.

We may not achieve substantial growth rates in future periods. Investors should not rely on our operating results for any prior periods as an indication of our future operating performance. To effectively manage any future growth, we must continue to maintain and enhance our financial, accounting, manufacturing, customer support and sales administration systems, processes and controls, and to integrate such systems, processes and controls into our acquired businesses. Failure to effectively manage any future growth could lead us to over-invest or under-invest in development, operational and administrative infrastructure; result in weaknesses in our infrastructure, systems, or controls; give rise to operational mistakes, losses, loss of customers, productivity or business opportunities; and result in loss of employees and reduced productivity of remaining employees.

Any continued growth is likely to require significant capital expenditures and might divert financial resources from other projects such as the development or integration of new products, technologies and services. As additional products and technologies are commercialized, we may need to incorporate new equipment, implement new technology systems, or hire new personnel with different qualifications. Failure to manage this growth or transition could result in turnaround time delays, higher product costs, declining product quality, deteriorating customer service, and slower responses to competitive challenges. A failure in any one of these areas could make it difficult for us to meet market expectations for our products and technologies, and could damage our reputation and the prospects for our business.

If our management is unable to effectively manage any growth, our expenses may increase more than expected, our revenue could decline or grow more slowly than expected and we may be unable to implement our business strategy. The quality of our products, technologies and services may suffer, which could negatively affect our reputation and harm our ability to retain and attract customers.

Our future capital needs are uncertain and we will require additional funding in the future to advance the commercialization of our OGM systems, Ionic Purification system, VIA software, and our other products, technologies and services, as well as continue our research and development efforts. If we fail to obtain sufficient additional funding, we will be forced to delay, reduce or eliminate significant portions of our commercialization and development efforts which could negatively impact our revenue opportunities.

Our operations have consumed substantial amounts of cash since our inception. We expect to continue to spend substantial amounts of cash in order to continue the commercialization of our products and technologies, fund our research and development programs, and execute potential strategic transactions. In connection with the preparation of our financial statements for the three and six months ended June 30, 2024, we had performed an analysis of our ability to continue as a going concern and based on our current business plan, we believed that our existing cash and cash equivalents and short-term investments would not be sufficient for the next twelve months from the issuance of the unaudited condensed consolidated financial statements included in this Quarterly Report and, accordingly, there continued to be substantial doubt about our ability to continue as a going concern within 12 months of the issuance of such financial statements. Our ability to execute our operating plan depends on our ability to generate sales and obtain additional funding through equity offerings, debt financings or potential licensing and collaboration arrangements. For example, we will need to raise substantial additional capital if we intend to:

- maintain and expand our sales and marketing efforts to further commercialize our products, technologies and services and address competitive developments;
- maintain and expand our research and development efforts to improve our existing products, technologies and services and develop and launch new products, technologies and services, particularly if any of our products, technologies and services are deemed by the FDA to be medical devices or otherwise subject to additional regulation by the FDA;
- pursue a regulatory path with the FDA, or a regulatory body outside the United States, to market our existing RUO products or new products utilized for diagnostic purposes;
- lease additional facilities or build-out existing facilities to grow our inventory and research and development;
- further expand our operations outside the United States;
- enter into collaboration arrangements, if any, or in-license products and technologies;
- acquire or invest in complementary businesses or assets;
- add operational, financial and management information systems; and
- cover increased costs incurred as a result of continued operation as a public company, including costs resulting from our no longer qualifying as an emerging growth company.

Our future funding requirements will be influenced by many factors, including:

- the cost of integrating our acquired businesses or of acquiring future businesses;
- market acceptance of our products, technologies and services, and the variability in costs to achieve such acceptance;
- the cost and timing of establishing additional sales, marketing and distribution capabilities;
- the cost of our research and development activities;
- our ability to satisfy any outstanding or future debt obligations ;
- high interest rates;
- supply chain disruptions;
- the success of our existing distribution and marketing arrangements and our ability to enter into additional arrangements in the future;
- the effects of geopolitical or macroeconomic developments, such as the ongoing military conflict between Russia and Ukraine, the Israel-Hamas war, related sanctions, recent and, potential future disruptions in access to bank deposits or lending commitments due to bank failures and global pandemics; and
- the effect of competing technological and market developments.

As of June 30, 2024, we had $10.4 million in cash and cash equivalents, $8.5 million in short-term investments, and $11.4 million in restricted cash.

We received net proceeds of approximately $9.3 million after deducting placement agent fees and offering expenses, from the issuance and sale of our securities in the July 2024 Offering. Based on our current business plans, we believe the net proceeds from such financings together with our existing cash and cash equivalents and short-term investments, and after taking into account inaccessible “restricted cash” under the terms of the JGB Purchase Agreement, will be sufficient to fund our operating expenses and capital expenditure requirements into at least the fourth quarter of 2024. Nevertheless, our existing cash and cash equivalents and short-term investments, will not be sufficient for us to achieve cash-flow break even and we expect to need to seek additional capital in the near future.

We have based this estimate on assumptions that may prove to be wrong, and we could use our capital resources sooner than we currently expect, requiring us to seek additional funds sooner than planned, through public or private equity or debt financings or other sources, such as strategic collaborations. The various ways we could raise additional capital carry potential risks. We cannot assure you that we will be able to obtain additional funds on acceptable terms, or at all. If we raise additional funds by issuing equity or equity-linked securities, our stockholders may experience dilution. Any equity or debt securities we issue could provide for rights, preferences, or privileges senior to those of holders of our common stock. Future debt financing, if available, may involve covenants restricting our operations or our ability to incur additional debt. Any debt or equity financing may contain terms that are not favorable to us or our stockholders. If we raise additional funds through collaboration and licensing arrangements with third parties, it may be necessary to relinquish some rights to our technologies or our products, or grant licenses on terms that are not favorable to us. In addition, we may not be able to access a portion of our existing cash and

cash equivalents and short-term investments or "restricted cash" in the account control agreement due to market conditions such as recent and potential future disruptions in access to bank deposits or lending commitments due to bank failures.

Global economic conditions have been challenging, with disruptions to, and volatility in, the credit and financial markets in the U.S. and worldwide resulting from the effects of ongoing geopolitical or macroeconomic developments. If these conditions persist or worsen, we could experience an inability to access additional capital. If we do not have, or are not able to obtain, sufficient funds, we will have to delay, reduce or eliminate significant portions of our development and commercialization efforts related to our technologies and products and we may be unable to continue to expand our installed base of OGM systems, any of which could, among other things, negatively impact our revenue opportunities. We also may have to further reduce marketing, customer support or other resources devoted to our products or technologies or cease operations entirely. Any of these factors could have a material adverse effect on our financial condition, operating results and business. Any of the foregoing could significantly harm our business, prospects, financial condition and results of operation and could cause the price of our securities to decline. Any additional fundraising efforts may divert our management from their day-to-day activities, which may adversely affect our ability to conduct our strategic operations.

You may experience future dilution as a result of future equity offerings.

In order to raise additional capital, we may in the future offer additional shares of our common stock, or other securities convertible into or exchangeable for our common stock at prices that may not be the same as the price per share in this offering. We may sell shares or other securities in any other offering at a price per share that is less than the price per share paid by investors in this offering, and investors purchasing shares or other securities in the future could have rights superior to existing stockholders. The price per share at which we sell additional shares of our common stock, or securities convertible or exchangeable into common stock, in future transactions may be higher or lower than the price per share paid by investors in this offering.

Servicing the Debentures requires a significant amount of cash, and we may not have sufficient cash flow from our business to pay our obligations under the Debentures or our other permitted indebtedness.

Our ability to make scheduled payments of principal or default interest, if any, or to refinance the Debentures or our other permitted indebtedness, depends on our future performance, which is subject to economic, financial, competitive and other factors, some of which are beyond our control. As of June 30, 2024, we had aggregate principal amount outstanding under the Debentures of $20.0 million. Our business may not continue to generate cash flow from operations in the future sufficient to satisfy our obligations under the Debentures or our other permitted indebtedness. If we are unable to generate such cash flow, we may be required to adopt one or more alternatives, such as reducing or delaying investments or capital expenditures, selling assets, refinancing or obtaining additional equity capital on terms that may be onerous or highly dilutive. We may only prepay the Debentures in full without the consent of the holders under certain circumstances, and our ability to refinance the Debentures or our other permitted indebtedness will also depend on the capital markets and our financial condition at such time. We may not be able to engage in any of these activities or engage in these activities on desirable terms, which could result in a default on the Debentures or our other indebtedness. As of June 30, 2024, there is substantial doubt about our ability to continue as a going concern and servicing the Debentures continues to impact our cash flow and liquidity.

The terms of the Debentures and the Debenture Purchase Agreement restrict our current and future operations. Upon an event of default under the Debentures, we may not be able to make any accelerated payments under the Notes or our other permitted indebtedness.

The Debentures and the Debenture Purchase Agreement contain a number of restrictive covenants that impose significant operating and financial restrictions on us and may limit our ability to engage in acts that may be in our long-term best interest. In particular, the Debentures contain customary affirmative and negative covenants (including covenants that limit our ability to incur debt, make investments, transfer assets, engage in certain transactions with affiliates and merge with other companies, in each case, other than those permitted by the Debentures, and events of default, and the Debentures and the Debenture Purchase Agreement contains customary covenants (including covenants that limit our ability to issue additional securities during specified periods and enter into variable rate transactions). Furthermore, we will be required to maintain cash subject to account control agreements in favor of the purchaser in a minimum amount equal to the lesser of (i) $11.0 million and (ii) the then outstanding balance of the Debenture. Our ability to meet the financial tests under the Debentures can be affected by events beyond our control, and we may be unable to meet them.

A breach of the covenants or restrictions under the Debentures and the Debenture Purchase Agreement or under the agreements governing any of our other permitted indebtedness could result in an event of default under the applicable indebtedness. Such a default may allow holders of the Debentures, if any, or the holders or lenders of our other permitted indebtedness, as applicable, to accelerate the related indebtedness, which may result in the acceleration of other indebtedness to which a cross-acceleration or cross-default provision applies. In addition, such lenders or holders could terminate commitments to lend money, if any. Furthermore, if we were unable to repay the Debentures or other permitted indebtedness then due and payable, secured lenders could proceed against the assets, if any, securing such indebtedness. In the event such lenders or holders accelerate the

repayment of the Debentures, or our other permitted borrowings, we may not have sufficient assets to repay that indebtedness. A default would also likely significantly diminish the market price of our common stock. Furthermore, as a result of these restrictions, we may be limited in how we conduct and grow our business, be unable to compete effectively or be unable to take advantage of new business opportunities. These restrictions may affect our ability to grow in accordance with our strategy.

Unfavorable geopolitical and macroeconomic developments could adversely affect our business, financial condition or results of operations.

Our results of operations could be adversely affected by general conditions in the global economy, the global financial markets and adverse geopolitical and macroeconomic developments, including without limitation inflation, potential future disruptions in access to bank deposits or lending commitments due to bank failures, slowing growth, rising interest rates and recession and the conflicts in the middle east. A severe or prolonged global economic downturn could result in a variety of risks to our business. For example, although inflation rates have been recently declining, particularly in the United States, they remain at levels not seen in years. Continuing high inflation rates may result in decreased demand for our products and services, increases in our operating costs (including our labor costs), prolonged unemployment, reduced liquidity and has limited and may continue to limit our ability to access credit or otherwise raise capital on acceptable terms, if at all. Risks of a prolonged economic downturn are particularly true in Europe, which is undergoing a continued severe economic crisis. A weak or declining economy, regardless of the reason for the decline, could also strain our suppliers, possibly resulting in supply disruption. For example, higher energy prices in Europe are causing an increase in cloud computing expenses, which impacts the cost for us and our partners. Any actual or perceived disruption in our product distribution channel could alter customer buying decisions, prompting customers to delay or cancel their orders, which would negatively impact our sales revenue and could harm our reputation.

Additionally, following the invasion of Ukraine by Russia, financial markets around the world experienced volatility. In response to the invasion, the United States, UK and EU, along with others, imposed significant new sanctions and export controls against Russia, Russian banks and certain Russian individuals and may implement additional sanctions or take further punitive actions in the future. The full economic and social impact of the sanctions imposed on Russia (as well as possible future punitive measures that may be implemented), as well as the counter measures imposed by Russia, in addition to the ongoing military conflict between Ukraine and Russia, which could conceivably expand into the surrounding region, remains uncertain; however, both the conflict and related sanctions have resulted, and could continue to result in disruptions to trade, commerce, pricing stability, credit availability, supply chain continuity and reduced access to liquidity, in both Europe and globally, and has introduced significant uncertainty into global markets. In particular, the Russia-Ukraine conflict has contributed to rapidly rising costs of living (driven largely by higher energy prices) in Europe and other advanced economies. As the adverse effects of this conflict continue to develop and potentially spread, both in Europe and throughout the rest of the world, our customers may be negatively impacted, which in turn may cause them to delay purchasing decisions and otherwise depress the level of spend conducted by such customers for our products, technologies and services. Further, a weak or declining economy could strain our suppliers, possibly resulting in additional supply disruption. As a result, our business and results of operations may be adversely affected by the ongoing conflict between Ukraine and Russia and related sanctions, particularly to the extent it escalates to involve additional countries, further economic sanctions or wider military conflict. We have operations, as well as current and potential new customers throughout Europe. If economic conditions in Europe and other key markets for our products and technologies continue to remain uncertain or deteriorate further, we could experience adverse effects on our business, supply chain, partners or customers.

Changes in tax laws or regulations that are applied adversely to us or our customers may have a material adverse effect on our business, cash flow, financial condition or results of operations.

New income, sales, use, excise or other tax laws, statutes, rules, regulations or ordinances could be enacted at any time, which could adversely affect our business operations and financial performance. Further, existing tax laws, statutes, rules, regulations or ordinances could be interpreted, changed, modified or applied adversely to us. For example, legislation including the Tax Cuts and Jobs Act of 2017; the Coronavirus Aid, Relief, and Economic Security Act; and the IRA, enacted many significant changes to the U.S. tax laws. Future guidance from the Internal Revenue Service and other tax authorities with respect to such legislation may affect us, and certain aspects of such legislation could be repealed or modified in future legislation. These developments, along with any other future changes in U.S. tax laws could have a material impact on the value of our deferred tax assets, could result in significant one-time charges, and could increase our future U.S. tax expense. In addition, it is uncertain if and to what extent various states will conform to federal tax legislation.

Moreover, should the scale of our international business activities expand, any changes in the U.S. taxation of such activities or any other changes in applicable non-U.S. tax laws could increase our worldwide effective tax rate and harm our future financial position and results of operations. Limitations on the ability of taxpayers to claim and utilize foreign tax credits and the deferral of certain tax deductions until earnings outside of the U.S. are repatriated to the U.S., as well as changes to United States tax laws that may be enacted in the future, could impact the tax treatment of future foreign earnings.

In addition, effective January 1, 2022, the Tax Cuts and Jobs Act of 2017 eliminated the option to deduct research and development expenses for tax purposes in the year incurred and requires taxpayers to capitalize and subsequently amortize such expenses over five years for research activities conducted in the United States and over 15 years for research activities conducted outside the United States. Unless the United States Department of the Treasury issues regulations that narrow the application of this provision to a smaller subset of our research and development expenses or the provision is deferred, modified, or repealed by Congress, it could harm our future operating results by effectively increasing our future tax obligations. The actual impact of this provision will depend on multiple factors, including the amount of research and development expenses we will incur, whether we achieve sufficient income to fully utilize such deductions and whether we conduct our research and development activities inside or outside the United States.

Our ability to use net operating losses and certain other tax attributes to offset future taxable income and taxes may be subject to limitations.

As of December 31, 2023, we had federal and state tax net operating loss carryforwards of $394.0 million and $159.4 million, respectively. The federal tax loss carryforwards include $370.2 million that do not expire, but utilization of such tax loss carryforwards is limited to 80% of our taxable income. The remaining federal tax loss carryforwards of $23.8 million begin to expire in 2027 unless previously utilized. Our state tax loss carryforwards began to expire in 2024 and will continue to expire unless previously utilized. As of December 31, 2023, we also had federal and California research credit carryforwards of $5.1 million and $9.4 million, respectively. The federal research credit carryforwards begin to expire in 2027 unless previously utilized. The California research credits carry forward indefinitely.

In addition, utilization of our net operating losses and research and development credit carryforwards is subject to limitations due to ownership changes that have occurred or that could occur in the future in accordance with applicable provisions of the Internal Revenue Code of 1986, as amended (the "Code"), and corresponding provisions of state law. We have experienced one or more ownership changes in the past and we may also experience additional ownership changes in the future as a result of subsequent changes in our stock ownership, some of which may be outside of our control.

The Company performed an ownership change analysis pursuant to Section 382 of the Code and identified that ownership changes occurred on various dates that will limit the Company's ability to utilize its net operating loss and R&D credit carryforwards. Based on the analysis, the Company's deferred tax assets related to the tax attributes that will expire unused as a result of the ownership change limitations have been adjusted as of December 31, 2023 with related valuation allowance disclosed above. As a result of limitations arising from the prior ownership changes, $33.0 million of federal and $5.4 million of California net operating loss carry-forwards were removed from the inventory of deferred tax assets. In addition, $6.4 million of federal R&D tax credits were removed from the deferred tax assets as of December 31, 2023. Further, the Company's deferred tax assets associated with such tax attributes could be significantly reduced upon a future ownership change within the meaning of Section 382 of the Code. In addition, at the state level, there may be periods during which the use of net operating losses and certain tax credits are suspended or otherwise limited, which could accelerate or permanently increase state taxes owed. For example, on June 27, 2024, California Senate Bill 167 was enacted, which imposes limits for certain taxpayers on the usability of California state net operating losses and certain California state tax credits in tax years beginning on or after January 1, 2024, and before January 1, 2027.

If our estimates or judgments relating to our critical accounting policies are based on assumptions that change or prove to be incorrect, our results of operation could fall below our publicly announced guidance or the expectations of securities analysts and investors, resulting in a decline in the market price of our securities.

The preparation of financial statements in conformity with generally accepted accounting principles in the United States, or GAAP, requires management to make estimates and assumptions that affect the amounts reported in our financial statements and accompanying notes. We base our estimates on historical experience and on various other assumptions that we believe to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets, liabilities, equity, revenue and expenses that are not readily apparent from other sources. If our assumptions underlying our estimates and judgements relating to our critical accounting policies change or if actual circumstances differ from our assumptions, estimates or judgements, our operating results may be adversely affected and could fall below our publicly announced guidance or the expectations of securities analysts and investors, resulting in a decline in the market price of our securities.

Our corporate cash saving initiatives and the associated headcount reductions we announced in May 2023, October 2023 and March 2024 could disrupt our business, and may not achieve our intended objectives.

In May 2023, October 2023 and March 2024, we undertook a cash savings initiative that included a reduction in force. These initiatives may be disruptive to our operations. For example, our headcount reductions could yield unanticipated consequences and costs, such as increased difficulties in implementing our business strategy due to the loss of institutional knowledge and expertise, reduced strength of our sales force and marketing efforts, attrition beyond the intended number of employees, decreased morale among our remaining employees, and the risk that we may not achieve the anticipated benefits of the reduction in force. In addition, while certain positions have been eliminated, certain functions necessary to our operations remain, and we may be unsuccessful in distributing the duties and obligations of departed employees among our remaining employees. The reduction in workforce could also make it difficult for us to pursue, or prevent us from pursuing, new opportunities and initiatives, including restricting the strength of our sales force and marketing efforts, due to insufficient personnel, or require us to incur additional and unanticipated costs to hire new personnel to pursue such opportunities or initiatives. Moreover, employee litigation related to the headcount reductions could be costly and prevent management from fully concentrating on the business. In addition, Bionano Laboratories' phase out of the offering of certain testing services related to NDDs, including ASDs, and other disorders of childhood development could have a negative impact on our cash flow, financial conditions or results of operations. In 2023, these products generated approximately $7.0 million of our overall $36.1 million in revenues.

Our future financial performance and our ability to develop our product candidates or additional assets will depend, in part, on our ability to effectively manage future growth or restructuring, as the case may be. In addition, if we are unable to realize the anticipated benefits from our cash savings initiatives including those we discussed under "Part I. Item 2. Management's Discussion and Analysis of Operations – Liquidity and Capital Resources", or if we experience significant adverse consequences of such initiative, our business, financial condition, and results of operations may be materially adversely affected.

Risks related to our business operations

Acquisitions, joint ventures and other strategic transactions could disrupt or otherwise harm our business and may cause dilution to our stockholders.

As part of our growth strategy, we have acquired and may continue to acquire other businesses, products or technologies as well as pursue strategic alliances, joint ventures, technology licenses or investments in complementary businesses or assets. We may not be able to locate or make suitable acquisitions on acceptable terms, and future acquisitions may not be effectively and profitably integrated into our business. Our failure to successfully complete the integration of any business or assets that we acquire could have an adverse effect on our prospects, business activities, cash flow, financial condition, results of operations and stock price. Integration challenges may include the following:

- disruption in our relationships with our pre-acquisition customers, distributors or suppliers, or in the relationships of our acquired businesses with their pre-acquisition customers, distributors or suppliers, as a result of such a transaction;
- unanticipated expenses and liabilities related to acquired companies or assets;
- disputes with the seller(s) of any acquired companies or assets or litigation with the seller(s) or third parties resulting from acquired companies or assets;
- difficulties integrating acquired personnel, technologies, operations and legal compliance obligations into our existing business;
- diversion of management time and focus from operating our business to acquisition integration challenges;
- increases in our expenses and reductions in our cash available for operations and other uses;
- possible write-offs or impairment charges relating to acquired businesses or assets;
- difficulties developing and marketing new products, technologies and services or integrating new products, technologies and services into our commercial plan;
- entering markets in which we have limited or no prior experience; and
- coordinating our efforts throughout various localities and time zones.

Foreign acquisitions involve unique risks in addition to those mentioned above, including those related to integration of operations across different cultures and languages, currency risks and the particular economic, political and regulatory risks associated with specific countries.

In addition, in connection with any such transactions, we may also issue equity securities in a dilutive manner, incur additional debt, assume contractual obligations or liabilities or expend significant cash. Such transactions could harm our operating results and cash position, negatively affect the price of our stock and cause dilution to our current stockholders. For example, in connection with our acquisition of Lineagen, a U.S.-based provider of proprietary molecular diagnostics services for individuals presenting with certain neurodevelopmental disorders, we issued 0.6 million shares of our common stock, in our acquisition of BioDiscovery, a U.S.-based software company with solutions for analysis, interpretation and reporting of genomics data, we paid upfront consideration consisting of a combination of approximately $52.3 million in cash and 0.3 million shares of our common stock, and in our acquisition of Purigen, a U.S-based DNA and RNA extraction company, we paid upfront consideration of approximately $32.0 million in cash. In connection with the acquisition of BioDiscovery, we issued an additional 0.5 million shares of our common stock subject to vesting based on continued service of a key employee. These shares vested in full on October 4, 2022.

The issuances of shares in connection with the Lineagen and BioDiscovery acquisitions resulted in dilution to our existing stockholders, the payment of cash in the BioDiscovery acquisition reduced our cash by approximately $52.3 million, the payment of cash in the Purigen acquisition reduced our cash by approximately $32.0 million, our headcount increased by more than 75 employees as a result of all three acquisitions, and we acquired new leases in each acquisition. Accordingly, in addition to transaction costs, these acquisitions have increased our operating expenses, further increasing our net losses. We cannot predict the number, timing or size of any future strategic transactions, or the effect that any such transactions might have on our operating results.

Although we conducted extensive business, financial and legal due diligence in connection with our evaluation of our recent acquisitions, our due diligence investigations may not have identified every matter that could adversely affect our business, operating results and financial condition, and such investigations may have identified matters that, in the opinion of our management based on information available at the time, bore an acceptable level of risk that they, individually or in the aggregate, might or might not adversely affect our business, operating results or financial condition. We may be unable to adequately address the financial, legal and operational risks introduced by our recent acquisitions and may have difficulty developing experience with the industries in which Lineagen, BioDiscovery and/or Purigen operate. Accordingly, we cannot

guarantee that our recent acquisitions will yield the results we have anticipated and unforeseen complexities and expenses may arise.

In addition, we may not achieve the revenues, growth prospects and synergies expected from these recent acquisitions, and any such benefits we do achieve may not offset our increased costs, resulting in a potential impairment of goodwill or other assets that were acquired. For any future acquisitions, we may similarly be unable to achieve revenue, growth prospects and synergies in a manner consistent with our expectations. Our failure to do so could adversely affect our business, operating results and financial condition.

If our products or technologies fail to achieve and sustain sufficient market acceptance, our revenue will be adversely affected.

Our success depends on our ability to develop and market products and technologies that are recognized and accepted as reliable, enabling and cost-effective. Most of the potential customers for our products and technologies already use expensive research systems in their laboratories that they have used for many years and may be reluctant to replace those systems with ours. Market acceptance of our systems will depend on many factors, including our ability to demonstrate to potential customers that our technology is an attractive alternative to existing technologies. Compared to some competing technologies, our technology is new and complex, and many potential customers have limited knowledge of, or experience with, our products and technologies. Prior to adopting our systems, some potential customers may need to devote time and effort to testing and validating our systems. Any failure of our systems to meet these customer benchmarks could result in potential customers choosing to retain their existing systems or to purchase systems other than ours. In addition, it is important that our gene mapping and DNA isolation systems be perceived as accurate and reliable by the scientific and medical research community as a whole.

The scientific community is comprised of a small number of early adopters and key opinion leaders who significantly influence the rest of the community. Historically, a significant part of our sales and marketing efforts has been directed at demonstrating the advantages of our technology to industry leaders, including those key opinion leaders, and encouraging such leaders to publish or present the results of their evaluation of our system. If we are unable to continue to motivate leading researchers to use our technology, or if such researchers are unable to achieve or unwilling to publish or present significant experimental results using our systems, acceptance and adoption of our systems will be slowed and our ability to increase our revenue would be adversely affected. We also run the risk that researchers may produce publications or presentations with findings that are negative about our technologies or systems, and that such findings may be due to factors outside of our control, which may also slow acceptance and adoption of our systems and adversely affect our ability to increase our revenue.

Equity issuances in connection with strategic transactions or raising additional capital may cause dilution to our stockholders or restrict our operations.

From time to time, we expect to finance our strategic transactions or cash needs through a combination of equity and debt financings. To the extent that we finance our strategic transactions or raise additional capital through the sale of equity or convertible debt securities, your ownership interest could be diluted and the terms of these securities may include liquidation or other preferences that adversely affect your rights as a common stockholder. Debt financing may involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends and may be secured by all or a portion of our assets.

In March 2021, we entered into a Sales Agreement with Cowen which provides for the sale, in our sole discretion, of shares of our common stock having a maximum aggregate offering price of up to $350.0 million through or to Cowen, acting as sales agent or principal, which we amended in March 2023 to decrease the maximum aggregate offering price to $200.0 million going forward. For the six months ended June 30, 2024, we sold approximately 14.0 million shares of common stock under the Cowen ATM for gross proceeds of approximately $17.6 million before deducting offering costs.

Further the exercise of the Registered Warrants issued in the October 2023 Offering (as amended in February 2024) will dilute the ownership interests of existing stockholders to the extent we deliver shares upon exercise of the Registered Warrants. In addition, the existence of the Debentures and Registered Warrants may encourage short selling by market participants because the conversion of the Debentures and exercise of the Registered Warrants could be used to satisfy short positions, or anticipated conversion of the Debentures or exercise of the Registered Warrants into shares of our common stock could depress the price of our common stock. In addition, we issued shares of our common stock in connection with our acquisitions of Lineagen and BioDiscovery. We also issued shares of our common stock in connection with the April 2024 Registered Direct Offering pursuant to which we agreed to issue and sell to certain institutional investors (i) an aggregate of 6.5 million shares of common stock, (ii) pre-funded warrants to purchase up to an aggregate of 2.2 million shares of common stock and (iii) warrants to purchase up to 8.7 million shares of common stock. Additionally, we issued shares of our common stock in connection with the July 2024 Registered Direct Offering pursuant to which we agreed to issue and sell to certain institutional investors (i) an aggregate of 11.7 million shares of common stock, (ii) pre-funded warrants to purchase up to an aggregate of 5.8 million shares of common stock and (iii) warrants to purchase up to 35.0 million shares of common stock.

Any future significant sales of our capital stock or strategic transactions in which we use equity as consideration would result in further dilution to our current stockholders. As a result of these issuances, our investors experienced dilution of their ownership interests.

The issuance of shares under awards granted under existing or future employee equity benefit plans may cause immediate and substantial dilution to our existing stockholders.

In order to provide persons who have a responsibility for our management and/or growth with additional incentive, to increase their proprietary interest in our success, and to support and increase our ability to attract and retain individuals of exceptional talent, we maintain multiple equity incentive plans. As of June 30, 2024, we had outstanding equity awards underlying those plans accounting for 4.4 million underlying shares. The total number of shares of our common stock available for the grant of awards under these plans is 2.1 million, 0.01 million and 0.2 million for our 2018 Equity Incentive Plan, as amended, 2018 Employee Stock Purchase Plan and 2020 Inducement Plan, as amended, respectively, subject to adjustment, including pursuant to automatic "evergreen" increases in certain of our plans. We may also adopt one or more additional employee equity benefit plans in the future. The issuance of shares under an employee equity benefit plan may result in substantial dilution to the interests of other stockholders. Accordingly, the issuance of shares under current or future employee equity benefit plans will have the effect of further diluting the proportionate equity interest and voting power of holders of our common stock.

If we are unable to execute our sales and marketing strategy for our Bionano Laboratories products and services, including diagnostic assays, and are unable to gain acceptance in the market, we may be unable to generate sufficient revenue to sustain our Bionano Laboratories business.

Our Bionano Laboratories business provides molecular diagnostics services and has engaged in only limited sales and marketing activities for the diagnostic assays currently offered through our CLIA-certified laboratory. To date, the revenue generated by our Bionano Laboratories business has been insufficient to fund operations.

Although we believe that our current assays and our planned future assays represent a promising commercial opportunity, our products or assays may never gain significant acceptance in the marketplace and therefore may never generate substantial revenue or profits for us. We will need to further establish a market for our products and diagnostic assays and build that market through physician education, awareness programs and the publication of clinical trial results. Gaining acceptance in medical communities requires, among other things, publications in leading peer-reviewed journals of results from studies using our current products, assays and services and/or our planned future products, assays and services. The process of publication in leading medical journals is subject to a peer review process and peer reviewers may not consider the results of our studies sufficiently novel or worthy of publication. Failure to have future studies published or studies published in peer-reviewed journals, or the publication of other studies in peer-reviewed journals that contradict our previously published studies, could limit the adoption of our current products, assays and services and our planned future products, assays and services. For example, on March 1, 2024, we decided to phase out the offering by Bionano Laboratories of certain testing services related to NDDs, including ASDs, and other disorders of childhood development. In 2023, these products generated approximately $7.0 million of our overall $36.1 million in revenues.

Our ability to successfully market the products and diagnostic assays that we have developed, and may develop in the future, will depend on numerous factors, including:

- conducting clinical utility studies of such assays in collaboration with key thought leaders to demonstrate their use and value in important medical decisions such as treatment selection;
- whether our current or future partners, vigorously support our offerings;
- the success of our sales force;
- whether healthcare providers believe such diagnostic assays provide clinical utility;
- whether the medical community accepts that such diagnostic assays are sufficiently sensitive and specific to be meaningful in patient care and treatment decisions;
- our ability to continually source raw materials, shipping kits and other products that we sell or consume in our manufacturing process that are of sufficient quality and supply;
- our ability to continue to fund planned sales and marketing activities; and
- whether private health insurers, government health programs and other third-party payors will adopt our current and future assays in their guidelines, or cover such diagnostic assays and, if so, whether they will adequately reimburse us.

Geopolitical and macroeconomic developments, such as potential future disruptions in access to bank deposits or lending commitments due to bank failures, may also increase the risk and uncertainty of the events described above and delay our development timelines. Failure to achieve widespread market acceptance of our current products, assays and services, as well as

our planned future products, assays and services, would materially harm our business, financial condition and results of operations.

In the near term, sales of our OGM systems, Ionic Purification system, VIA software, consumables and genome analysis services will depend on levels of research and development spending by clinical research laboratories, academic and governmental research institutions and biopharmaceutical companies, a reduction in which could limit demand for our technologies and products and adversely affect our business and operating results.

In the near term, we expect that our revenue from sales of our OGM systems, Ionic Purification system, VIA software, consumables and OGM services will be derived primarily from sales to academic and governmental research institutions, and academic and commercial clinical laboratories, as well as biopharmaceutical and contract research companies worldwide for research applications. The demand for our products and technologies will depend in part upon the research and development budgets of these customers, which are impacted by factors beyond our control, such as:

- changes in government programs that provide funding to research institutions and companies;
- changes in the regulatory environment;
- scientists' and customers' opinions of the utility of new products, technologies or services;
- reductions in or other difficulties relating to, among other things, staffing, capacity, shutdowns or slowdowns of laboratories and other institutions as well as other impacts stemming from various geopolitical and macroeconomic developments, such as the conflict between Ukraine and Russia and, related sanctions, the conflicts in the Middle East, potential future disruptions in access to bank deposits or lending commitments due to bank failures and global pandemics.
- differences in budgetary cycles; and
- market acceptance of relatively new technologies, such as ours.

In addition, our operating results may fluctuate substantially due to reductions and delays in research and development expenditures by our customers. Any decrease in customers' budgets or expenditures, including impacts stemming from various geopolitical and macroeconomic developments, or in the size, scope or frequency of capital or operating expenditures, could materially and adversely affect our business, operating results and financial condition.

The sales cycle for our systems can be lengthy and variable, which makes it difficult for us to forecast revenue and other operating results.

The sales process for our systems generally involves numerous interactions with multiple individuals within an organization, and often includes in-depth analysis by potential customers of our technology and products and a lengthy review process. Our customers' evaluation processes often involve a number of factors, many of which are beyond our control. As a result of these factors, the capital investment required to purchase our systems and the budget cycles of our customers, the time from initial contact with a customer to our receipt of a purchase order can vary significantly. Given the length and uncertainty of our sales cycle, we have in the past experienced, and expect to in the future experience, fluctuations in our sales on a period-to-period basis. In addition, any failure to meet customer expectations could result in customers choosing to retain their existing systems, use existing assays not requiring capital equipment or purchase systems other than ours.

Our long-term results depend upon our ability to improve existing products and technologies and introduce and market new products and technologies successfully.

Our business is dependent on the continued improvement of our existing products and technologies and our development of new products and technologies utilizing our current or other potential future technology. As we introduce new products or technologies or refine, improve or upgrade versions of existing products or technologies, we cannot predict the level of market acceptance or the amount of market share these products or technologies will achieve, if any.

Consistent with our strategy of offering new products and product refinements, we expect to continue to use a substantial amount of capital for product development and refinement. We may need additional capital for product development and refinement than is available on terms favorable to us, if at all, which could adversely affect our business, financial condition or results of operations.

We generally sell our products and technologies in industries that are characterized by rapid technological changes, frequent new product and technology introductions and changing industry standards. If we do not develop new products and technologies and product and technology enhancements based on technological innovation on a timely basis, our products and technologies may become obsolete over time and our revenues, cash flow, profitability and competitive position will suffer. Our success will depend on several factors, including our ability to:

- correctly identify customer needs and preferences and predict future needs and preferences;

- allocate our research and development funding to products and technologies with higher growth prospects;
- anticipate and respond to our competitors' development of new products and technological innovations;
- innovate and develop new technologies and applications, including software applications, and acquire or obtain rights to third-party technologies that may have valuable applications in the markets we serve;
- our ability to successfully market our Ionic Purification system;
- successfully commercialize new technologies in a timely manner, price them competitively and manufacture and deliver sufficient volumes of new products of appropriate quality on time; and
- customers' willingness to adopt new technologies.

In addition, if we fail to accurately predict future customer needs and preferences or fail to produce viable technologies, we may invest heavily in research and development of products and technologies that do not lead to significant revenue. For example, we completed the Purigen acquisition in November 2022 and have devoted and will need to continue to devote time and resources in order to further develop and integrate Purigen's Ionic Purification system for our current and anticipated product offerings. We may be unsuccessful in achieving our desired results or in marketing such solutions to our future customers. Even if we successfully innovate and develop new products and technologies and product and technological enhancements, we may incur substantial costs in doing so, and our profitability may suffer.

Our ability to develop new products and technologies based on innovation can affect our competitive position and often requires the investment of significant resources. Difficulties or delays in research, development or production of new products, technologies and services or failure to gain market acceptance of new products and technologies may reduce future revenues and adversely affect our competitive position.

If we do not successfully manage the development and launch of new products and technologies, our financial results could be adversely affected.

We face risks associated with launching new products and technologies. If we encounter development or manufacturing challenges or discover errors during our product or technology development cycle, the launch dates of new products and technologies may be delayed. The expenses or losses associated with unsuccessful product and technology development or launch activities or lack of market acceptance of our new products and technologies could adversely affect our business or financial condition.

Our future success is dependent upon our ability to further penetrate our existing customer base, attract new customers and retain the customers of our acquired businesses.

Our current customer base for our products and technologies is primarily composed of academic and governmental research institutions and biopharmaceutical and contract research companies and, for our Bionano Laboratories diagnostic services, physicians and their patients. Our success will depend upon our ability to respond to the evolving needs of, and increase our market share among, existing customers and additional potential customers, marketing new products, technologies and services as we develop them. Our successes will also depend on our ability to maintain relationships with the customers of our acquired businesses. Identifying, engaging and marketing to customers who are unfamiliar with our current products and technologies requires substantial time, expertise and expense and involves a number of risks, including:

- our ability to attract, retain and manage the sales, marketing and service personnel necessary to expand market acceptance for our technology;
- the time and cost of maintaining and growing a specialized sales, marketing and service force; and
- the fact that our sales, marketing and service force may be unable to execute successful commercial activities.

We have utilized third parties to assist with sales, distribution and customer support in certain regions of the world. We may be unsuccessful in attracting desirable sales and distribution partners. We may also be unable to enter into arrangements with such partners on favorable terms. Any failure of our sales and marketing efforts, or those of any third-party sales and distribution partners, could adversely affect our business.

The size of the markets for our products and technologies may be smaller than we estimate, and new markets may not develop as quickly as we expect, or at all, limiting our ability to successfully sell our products and technologies.

The market for our OGM-based products and technologies is evolving, making it difficult to predict with any accuracy the market opportunity for our current and future products and technologies. Our estimates of the total addressable market for our current and future products and technologies are based on a number of internal and third-party estimates and assumptions. Both our current market opportunity estimates for cytogenomics and discovery research and our potential future market opportunity estimates, including newborn screening, population genomics, neurological and cardiological risk assessment, and cell bioprocessing quality control, are forward-looking statements and are subject to significant risks and uncertainties. While these were prepared in good faith, we cannot provide assurances as to future results or events because these estimates are dependent in part on, among other things, anticipated demand for OGM instruments, complementary capabilities of OGM and NGS, and expected consumption of chips and sample prep and labeling kits. In particular, these estimates are based on current and projected selling prices for instruments and consumables, each of which is subject to change over time and may be drastically affected without warning due to matters outside of our control, including geopolitical and macroeconomic developments.

The estimates and assumptions underlying our addressable market opportunities also involve significant judgments with respect to, among other things, future economic, competitive, regulatory, market and financial conditions, as well as future customer demand, business decisions and corporate opportunities that may not be realized, and that are inherently subject to significant business, economic, competitive and regulatory risks and uncertainties, all of which are difficult to predict and many of which are outside of our control. For example, as interest rates continue to rise, our customers may be unable to deploy additional capital to purchase, or may re-prioritize their budget away from, our products and technologies. In addition, our underlying assumptions and estimates may prove to be inaccurate and our financial objectives may not be realized, and therefore our actual results may differ materially from our estimated addressable market opportunities.

Any addressable market opportunities identified in this Quarterly Report should not be construed as financial guidance and should not otherwise be relied upon as being necessarily indicative of future results, and you are cautioned not to place undue reliance on our estimated addressable opportunities. In preparing our estimated addressable opportunities, we have relied upon and assumed, without independent verification, the accuracy and completeness of certain industry and market information provided to us by third parties or through publicly available sources, which information involves assumptions and limitations, and you should not give undue weight to such information.

We are currently limited to RUO with respect to many of the materials and components used in our consumable products including our assays.

Our instruments, consumable products and assays are purchased from suppliers with a restriction that they be used for RUO. While we have focused initially on the life sciences research market and RUO products only, part of our business strategy is to expand our product line to encompass products that are intended to be used for the diagnosis of disease and precision healthcare, either alone or in collaboration with third parties. The use of our RUO products for any such diagnostic purposes would require that we obtain regulatory clearance or approval to market our products for those purposes and also that we acquire the materials and components used in such products from suppliers without an RUO restriction. There can be no assurance that we will be able to acquire these materials and components for use in diagnostic products on acceptable terms, if at all. If we are unable to do so, we would not be able to expand our non-Bionano Laboratories product offerings beyond RUO, and our business and prospects would suffer.

The FDA Guidance on “Distribution of In Vitro Diagnostic Products Labeled for Research Use Only or Investigational Use Only”, emphasizes that the FDA will review the totality of the circumstances when evaluating whether equipment and testing components are properly labeled as RUO. It further states that merely including a labeling statement that a product is intended for RUO will not necessarily render the device exempt from the FDA’s 510(k) clearance, premarket approval application (“PMA”), or other requirements, if the circumstances surrounding the distribution of the product indicate that the manufacturer intends for its product to be offered for clinical diagnostic use. These circumstances may include written or verbal marketing claims or links to articles regarding a product’s performance in clinical applications, a manufacturer’s provision of technical support for clinical validation or clinical applications, or solicitation of business from clinical laboratories, all of which could be considered evidence of intended uses that conflict with RUO labeling. If the FDA were to determine that our RUO products were intended for use in clinical investigation, diagnosis or treatment decisions, or that express or implied clinical or diagnostic claims were made for our RUO products, those products could be considered misbranded or adulterated under the Federal Food, Drug, and Cosmetic Act. If the FDA determines that our RUO products are being marketed for clinical diagnostic use without the required PMA or 510(k) clearance, we may be required to cease marketing our products as planned, recall the products from customers, revise our marketing plans, and/or suspend or delay the commercialization of our products until we obtain the required authorization. We also may be subject to a range of enforcement actions by the FDA, including warning or untitled letters, injunctions, civil monetary penalties, criminal prosecution, and recall and/or seizure of products, as well as significant adverse publicity.

If, in the future, we choose to commercialize our RUO products for clinical diagnostic use, we will be required to comply with the FDA's premarket review and post-market control requirements for in-vitro diagnostics ("IVD"), products, as may be applicable. Complying with the FDA's PMA and/or 510(k) clearance requirements may be expensive, time-consuming, and subject us to significant and/or unanticipated delays. Our efforts may never result in an approved PMA or 510(k) clearance for our products. Even if we obtain a PMA or 510(k) clearance, where required, such authorization may not be for the use or uses we believe are commercially attractive and/or are critical to the commercial success of our products. As a result, being subject to the FDA's premarket review and/or post-market control requirements for our products could materially and adversely affect our business, financial condition and results of operations.

We have limited experience in marketing and selling our products and technologies, and if we are unable to successfully commercialize our products and technologies, our business and operating results will be adversely affected.

We have limited experience marketing and selling our products and technologies. We currently sell our OGM systems and Ionic Purification system for RUO through our direct field sales and support organizations located in North America and Europe and through a combination of our own sales force and third-party distributors in additional major markets such as Australia, China, Japan and South Korea.

The future sales of our products and technologies will depend in large part on our ability to effectively market and sell our products and technologies, successfully maintain and manage our sales force, and increase the scope of our marketing efforts. We may also enter into additional distribution arrangements in the future. Because we have limited experience in marketing and selling our products and technologies, our ability to forecast demand, the infrastructure required to support such demand and the sales cycle to customers is unproven. If we do not build an efficient and effective sales force, our business and operating results will be adversely affected.

We rely on a single contract manufacturer for our OGM systems and a single contract manufacturer for our chip consumables. If either of these manufacturers should fail or not perform satisfactorily, our ability to supply these products would be negatively and adversely affected.

We currently rely on a single contract manufacturer to manufacture and supply all of our OGM-based instruments and, our Ionic Purification instruments. In addition, we rely on a single contract manufacturer based in the United States to manufacture and supply all of our chip consumables. Since our contracts with these manufacturers do not commit them to supply quantities beyond the amounts included in our purchase orders, and do not commit them to carry inventory or make available any particular quantities, these contract manufacturers may give other customers' needs higher priority than ours, and we may not be able to obtain adequate supplies in a timely manner or on commercially reasonable terms. If either of these manufacturers were to be unable to supply instruments or chip consumables, our business would be harmed.

In the event it becomes necessary to utilize different contract manufacturers for our OGM-based instruments or chip consumables, we would experience additional costs, delays and difficulties in doing so as a result of identifying and entering into an agreement with a new supplier as well as preparing such new supplier to meet the logistical requirements associated with manufacturing our units, and our business would suffer. We may also experience additional costs and delays in the event we need access to or rights under any intellectual property of these current manufacturers.

We have experienced manufacturing problems or delays that could limit the growth of our revenue or increase our losses.

We have encountered situations that resulted in delays or shortfalls caused by our outsourced manufacturing suppliers and by other third-party suppliers who manufacture components for our products. We have been negatively impacted by unfavorable flowcell yields in the production cycle. If the same or a similar issue were to occur, it could lead to lower gross margins in future periods. If we are unable to keep up with demand for our products, our revenue could be impaired, market acceptance for our products and systems could be adversely affected and our customers might instead purchase our competitors' products and systems. Our inability to successfully manufacture our products would have a material adverse effect on our operating results.

If our laboratory facilities become damaged or inoperable or we are required to vacate our existing facilities, our ability to conduct our laboratory analysis and pursue our research and development efforts may be jeopardized.

We currently perform all research and development activities and OGM services at a single laboratory facility in San Diego, California. All of our molecular diagnostics services are reported through a single facility in San Diego, California.

Our facilities and equipment could be harmed or rendered inoperable by natural or man-made disasters, including war, fire, earthquake, power loss, communications failure, terrorism, burglary, public health crises (including restrictions that may result from various geopolitical and macroeconomic developments, such as the ongoing conflict between Ukraine and Russia) or other events, which may make it difficult or impossible for us to perform our testing services for some period of time or to receive and store samples. The inability to perform tests or to reduce the backlog of sample analysis that could develop if one or both of our facilities become inoperable, for even a short period of time, may result in the loss of revenue, loss of customers or harm to our reputation, and we may be unable to regain that revenue, those customers or repair our reputation in the future.

Furthermore, integral parties in our supply chain are operating from single sites, increasing their vulnerability to natural disasters and man-made disasters or other sudden, unforeseen and severe adverse events.

In addition, the loss of our samples due to such events could limit or prevent our ability to conduct research and development analysis on existing tests as well as tests in development.

Our facilities and the equipment we use to perform our testing and research and development could be unavailable or costly and time-consuming to repair or replace. It would be difficult, time-consuming and expensive to rebuild our facilities, to locate and qualify a new facility with applicable regulatory authorities, replace certain pieces of equipment or license or transfer our proprietary technology to a third party, particularly in light of licensure and accreditation requirements. Even in the unlikely event that we are able to find a third party with such qualifications to enable us to resume our operations, we may be unable to negotiate commercially reasonable terms.

We carry insurance for damage to our property and the disruption of our business, but this insurance may not cover all of the risks associated with damage or disruption to our business, may not provide coverage in amounts sufficient to cover our potential losses and may not continue to be available to us on acceptable terms, if at all.

We rely on a limited number of suppliers or, in some cases, one supplier, for some of our materials and components used in our products, and may not be able to find replacements or immediately transition to alternative suppliers, which could have a material adverse effect on our business, financial condition, results of operations and reputation.

We rely on limited or sole suppliers for certain reagents and other materials and components that are used in our products. While we periodically forecast our needs for such materials and enter into standard purchase orders with our suppliers, we do not have long-term contracts with many of these suppliers. If we were to lose such suppliers, there can be no assurance that we will be able to identify or enter into agreements with alternative suppliers on a timely basis on acceptable terms, if at all. An interruption in our operations, including our laboratory operations, could occur if we encounter delays or difficulties in securing these materials, or if the quality of the materials supplied do not meet our requirements, or if we cannot then obtain an acceptable substitute. The time and effort required to qualify a new supplier and ensure that the new materials provide the same or better quality results could result in significant additional costs. Any such interruption could significantly affect our business, financial condition, results of operations and reputation.

In addition, certain of the components used in our instruments are sourced from limited or sole suppliers. If we were to lose such suppliers, there can be no assurance that we will be able to identify or enter into agreements with alternative suppliers on a timely basis on acceptable terms, if at all. An interruption in our ability to sell and deliver instruments to customers could occur if we encounter delays or difficulties in securing these components, or if the quality of the components supplied do not meet specifications, or if we cannot then obtain an acceptable substitute. If any of these events occur, our business and operating results could be harmed.

Also, in order to mitigate these risks, we maintain inventories of certain supplies at higher levels than would be the case if multiple sources of supply were available. If our sales or testing volume decreases or we switch suppliers, we may hold excess supplies with expiration dates that occur before use which would adversely affect our losses and cash flow position. As we introduce any new products, we may experience supply issues as we ramp up our sales or test volume. If we should encounter delays or difficulties in securing, reconfiguring or revalidating the equipment, reagents or other materials we require for our products, our business, financial condition, results of operations and reputation could be adversely affected.

Undetected errors or defects in our products or technologies could harm our reputation, decrease market acceptance of our products or technologies or expose us to product liability claims or recalls.

Our products or technologies may contain undetected errors or defects when first introduced or as new versions or new products or technologies are released. Disruptions affecting the introduction or release of, or other performance problems with, our products or technologies may damage our customers' businesses and could harm their and our reputations. If that occurs, we may incur significant costs, the attention of our key personnel could be diverted, or other significant customer relations problems may arise. We may also be subject to warranty and liability claims for damages related to errors or defects in our products or technologies. In addition, if we do not meet industry or quality standards, if applicable, our products may be subject to recall. A material liability claim, recall or other occurrence that harms our reputation or decreases market acceptance of our products or technologies could harm our business and operating results.

If our customers develop or use our products or assays for diagnostic purposes, someone could file a product liability claim alleging that one of our products contained a design or manufacturing defect that resulted in the failure to adequately perform, leading to death or injury. In addition, the marketing, sale and use of our current or future products and assays could lead to the filing of product liability claims against us if someone alleges that our products failed to perform as designed. We may also be subject to liability for errors in the results we provide or for a misunderstanding of, or inappropriate reliance upon, the information we provide.

A product liability claim could result in substantial damages and be costly and time consuming to defend, either of which could materially harm our business or financial condition. We cannot assure investors that our product liability insurance would adequately protect our assets from the financial impact of defending a product liability claim. Any product liability claim brought against us, with or without merit, could increase our product liability insurance rates or prevent us from securing insurance coverage in the future. Additionally, any product liability lawsuit could damage our reputation, or cause current partners to terminate existing agreements and potential partners to seek other partners, any of which could impact our results of operations.

We may also initiate a correction to our existing products or assays, which could lead to increased costs and increased scrutiny by regulatory authorities and our customers regarding the quality and safety of our products or services, as well as negative publicity. The occurrence of any of these events could have an adverse effect on our business and results of operations.

Our reliance on distributors for sales of our products outside of the United States could limit or prevent us from selling our products and could impact our revenue.

We may grow our business internationally, and to do so we must attract additional distributors and retain existing distributors to maximize the commercial opportunity for our products. There is no guarantee that we will be successful in attracting or retaining desirable sales and distribution partners or that we will be able to enter into such arrangements on favorable terms. Distributors may not commit the necessary resources to market and sell our products to the level of our expectations or may choose to favor marketing the products of our competitors. If current or future distributors do not perform adequately, or we are unable to enter into effective arrangements with distributors in particular geographic areas, we may not realize long-term international revenue growth. In addition, if our distributors fail to comply with applicable laws and ethical standards, including anti-bribery laws, this could damage our reputation and could have a significant adverse effect on our business and our revenues.

We expect to generate a substantial portion of our revenue internationally in the future and can become further subject to various risks relating to our international activities, which could adversely affect our business, operating results and financial condition.

During the six months ended June 30, 2024 and 2023, approximately 59% and 60%, respectively, of our revenue was generated from customers located outside of the United States. We believe that a substantial percentage of our future revenue will continue to come from international sources as we maintain our existing overseas operations and aim to develop opportunities in additional areas. We have limited experience operating internationally and engaging in international business involves a number of difficulties and risks, including:

- required compliance with existing and changing foreign regulatory requirements and laws;
- difficulties and costs of staffing and managing foreign operations;
- difficulties protecting or procuring intellectual property rights;
- required compliance with anti-bribery laws, such as the U.S. FCPA, data privacy and security requirements, labor laws and anti-competition regulations;
- export or import restrictions;
- laws and business practices favoring local companies;
- longer payment cycles and difficulties in enforcing agreements and collecting receivables through certain foreign legal systems;
- political and economic instability; and
- potentially adverse tax consequences, tariffs, customs charges, bureaucratic requirements and other trade barriers.

Historically, most of our revenue has been denominated in U.S. dollars. For sales made to customers outside of the United States, we sell our products and services in local currency. If our international operations grow, our results of operations and cash flows will be subject to increasing fluctuations due to changes in foreign currency exchange rates, which could harm our business. For example, if the value of the U.S. dollar increases relative to foreign currencies, in the absence of a corresponding change in local currency prices, our revenue could be adversely affected as we convert revenue from local currencies to U.S. dollars. If we dedicate significant resources to our international operations and are unable to manage these risks effectively, our business, operating results and financial condition will suffer.

If we are unable to recruit, train, retain, motivate and integrate key personnel, we may not achieve our goals.

Our future success depends on our ability to recruit, train, retain, motivate and integrate key personnel, including our senior management team, as well as our research and development, manufacturing and sales and marketing personnel. Competition for

qualified personnel is intense. Our growth depends, in particular, on attracting and retaining highly-trained sales personnel with the necessary scientific background and ability to understand our systems at a technical level to effectively identify and sell to potential new customers. Additionally, our growth depends on attracting and retaining highly-skilled personnel with the necessary technical and scientific background needed to develop new products and technologies. Because of the complex and technical nature of our products and technologies and the dynamic market in which we compete, any failure to attract, train, retain, motivate and integrate qualified personnel could materially harm our operating results and growth prospects. In response to competition, rising inflation rates and labor shortages, we may need to adjust employee cash compensation, which would affect our operating costs and our margins, or equity compensation, which would affect our outstanding share count, causing dilution to existing shareholders and possibly souring investor sentiment, which could in turn make it difficult to achieve our goals.

If we cannot provide quality technical and applications support, we could lose customers and our business and prospects will suffer.

The placement of our products at new customer sites, the introduction of our technology into our customers' existing laboratory workflows and ongoing customer support can be complex. Accordingly, we need highly trained technical support personnel. Hiring technical support personnel is very competitive in our industry due to the limited number of people available with the necessary scientific and technical backgrounds and ability to understand our technology at a technical level. To effectively support potential new customers and the expanding needs of current customers, we will need to substantially expand our technical support staff. If we are unable to attract, train or retain the number of highly qualified technical services personnel that our business needs, our business and prospects will suffer.

If our information technology systems or data or those of third parties with whom we work, are or were compromised, we could experience adverse consequences resulting from such compromise, including but not limited to regulatory investigations or actions; litigation; fines and penalties; disruptions of our business operations; reputational harm; loss of revenue or profits; loss of customers or sales; and other adverse consequences.

We are increasingly dependent upon information technology systems, infrastructure and data to operate our business. In the ordinary course of our business, we and the third parties with whom we work collect, store, use, protect, secure, generate, transfer, dispose of, transmit, disclose, and otherwise process sensitive, proprietary, and confidential information, including intellectual property, trade secrets, financial information, and personal data (including protected health information) (collectively, "Sensitive Data"). As a result, we and the third parties with whom we work face a variety of evolving threats including but not limited to ransomware attacks, which could cause security incidents.

Cyberattacks, malicious internet-based activity, online and offline fraud, and other similar activities threaten the confidentiality, integrity, and availability of our Sensitive Data and information technology systems, and those of the third parties with whom we work. Such threats are prevalent and continue to rise, are becoming increasingly difficult to detect, and come from a variety of sources, including traditional computer "hackers," threat actors, personnel (such as through theft or misuse), "hacktivists," sophisticated nation-states, and nation-state-supported actors.

Some actors now engage and are expected to continue to engage in cyber-attacks, including without limitation nation-state actors for geopolitical reasons and in conjunction with military conflicts and defense activities. During times of war and other major conflicts, including as a result of the ongoing military conflict between Russia and Ukraine and the related sanctions imposed against Russia, and the military conflict between Israel and Gaza, we and the third parties with whom we work may be vulnerable to a heightened risk of these attacks, including retaliatory cyber-attacks that could materially disrupt our systems and operations, supply chain, and ability to produce, sell and distribute our goods and services.

We and the third parties with whom we work are subject to a variety of evolving threats, including but not limited to social-engineering attacks (such as through deep fakes, which may be increasingly more difficult to identify as fake, and phishing attacks), malicious code (such as viruses and worms), malware (including as a result of advanced persistent threat intrusions), denial-of-service attacks (credential stuffing), credential harvesting, personnel misconduct or error, ransomware attacks, supply-chain attacks, software bugs, server malfunctions, software or hardware failures, loss of data or other information technology assets, adware, telecommunications failures, attacks enhanced or facilitated by AI, earthquakes, fires, floods, and other similar threats. In particular, severe ransomware attacks, including those perpetrated by organized criminal threat actors, nation-states, and nation-state supported actors, are becoming increasingly prevalent and can lead to significant interruptions in our operations, ability to provide our products and services, loss of Sensitive Data and income, reputational harm, and diversion of funds. Extortion payments may alleviate the negative impact of a ransomware attack, but we may be unwilling or unable to make such payments due to, for example, applicable laws or regulations prohibiting such payments.

It may be difficult and/or costly to detect, investigate, mitigate, contain, and remediate a security incident. Our efforts to do so may not be successful. Actions taken by us or the third parties with whom we work to detect, investigate, mitigate, contain, and remediate a security incident could result in outages, data losses, and disruptions of our business. Threat actors may also gain access to other networks and systems after a compromise of our networks and systems.

In addition, our reliance on third parties to operate critical business systems to process Sensitive Data could introduce new cybersecurity risks and vulnerabilities and other threats to our business operations. We rely on third parties in a variety of contexts, including, without limitation, third-party providers of cloud-based infrastructure, encryption and authentication technology, employee email, content delivery to customers, and other functions and, as a result, we and the third parties with whom we work face a variety of evolving threats, including but not limited to ransomware attacks, which could cause security incidents. Our ability to monitor these third parties' cybersecurity practices is limited, and these third parties may not have adequate information security measures in place. While we may be entitled to damages if the third parties with whom we work fail to satisfy their privacy or security-related obligations to us, any award may be insufficient to cover our damages, or we may be unable to recover such award. We share or receive Sensitive Data with or from third parties. Similarly, supply chain attacks have increased in frequency and severity, and we cannot guarantee that third parties and infrastructure in our supply chain or our third-party partners' supply chains have not been compromised or that they do not contain exploitable defects or bugs that could result in a breach of or disruption to our information technology systems (including our software) or the third-party information technology systems that support us and our services.

Remote work has become more common and has increased risks to our information technology systems and data, as more of our employees utilize network connections, computers and devices outside our premises or network, including working at home, while in transit, and in public locations. Additionally, past or future business transactions (such as acquisitions or integrations) could expose us to additional cybersecurity risks and vulnerabilities, as our systems and Sensitive Data could be negatively affected by vulnerabilities present in acquired or integrated entities' systems and technologies. Furthermore, we may discover security issues that were not found during due diligence of such acquired or integrated entities, and it may be difficult to integrate companies into our information technology environment and security program.

While we have implemented security measures designed to protect against security incidents, there can be no assurance that these measures will be effective. We take steps designed to detect, mitigate, and remediate vulnerabilities in our information systems (such as our hardware and/or software, including that of third parties with whom we work). We may not, however, detect and remediate all such vulnerabilities including on a timely basis. Further, we may experience delays in deploying remedial measures and patches designed to address identified vulnerabilities. Vulnerabilities could be exploited and result in a security incident.

Any of the previously identified or similar threats could cause a security incident or other interruption. that could result in unauthorized, unlawful, or accidental acquisition, modification, destruction, loss, alteration, encryption, disclosure of, or access to our Sensitive Data or our information technology systems, or those of the third parties with whom we work. A security incident or other interruption could disrupt our ability (and that of third parties with whom we work) to provide our products, software and services. We may expend significant resources or modify our business activities (including our clinical trial activities) in an effort to protect against security incidents. Certain data privacy and security obligations may require us to implement and maintain specific security measures, or industry-standard or reasonable security measures to protect our information technology systems and Sensitive Data.

Applicable data privacy and security obligations may require us, or we may voluntarily choose, to notify relevant stakeholders, including affected individuals, customers, regulators, and investors, of security incidents, or to take other actions, such as providing credit monitoring and identify theft protection services. Such disclosures and related actions can be costly, and the disclosures or the failure to comply with such applicable requirements could lead to adverse consequences. If we (or a third party with whom we work) experience a security incident or are perceived to have experienced a security incident, we may experience adverse consequences, such as government enforcement actions (for example, investigations, fines, penalties, audits, and inspections); additional reporting requirements and/or oversight; restrictions on processing data (including personal data); litigation (including class claims); indemnification obligations; negative publicity; reputational harm; monetary fund diversions; divergent of management attention; interruptions in our operations (including availability of data); financial loss; and other similar harms. Security incidents and attendant consequences may cause customers to stop using our software or services, deter new customers from using our software or services, and negatively impact our ability to grow and operate our business.

Our contracts may not contain limitations of liability, and even where they do, there can be no assurance that limitations of liability in our contracts are sufficient to protect us from liabilities, damages, or claims related to our data privacy and security obligations. We cannot be sure that our insurance coverage, if any, will be adequate or sufficient to protect us from or to mitigate liabilities arising out of our privacy and security practices, that such coverage will continue to be available on commercially reasonable terms or at all, or that such coverage will pay future claims.

In addition to experiencing a security incident, third parties may gather, collect, or infer Sensitive Data about us from public sources, data brokers, or other means that reveals competitively sensitive details about our organization and could be used to undermine our competitive advantage or market position.

We are subject to stringent and evolving U.S. and foreign laws, regulations, and rules, contractual obligations, industry standards, policies and other obligations related to data privacy and security. Our actual or perceived failure to comply with such obligations could lead to regulatory investigations or actions; litigation (including class claims) and mass arbitration demands; fines and penalties; disruption of our business operations; reputational harm; loss of revenue or profits; loss of customers or sales; and other adverse business consequences.

In the ordinary course of business, we collect, store, protect, secure, generate, transfer, dispose of, use, transmit, disclose and otherwise process personal data (including protected health information) and other sensitive information, including proprietary and confidential business data, trade secrets, and intellectual property. Our data processing activities subject us to numerous data privacy and security obligations, such as various laws, regulations, guidance, industry standards, external and internal privacy and security policies, contractual requirements, and other obligations that govern the processing of personal data by us and on our behalf. In the United States, federal, state, and local governments have enacted numerous data privacy and security laws, including data breach notification laws, personal data privacy laws, consumer protection laws (e.g., Section 5 of the Federal Trade Commission Act), and other similar laws (e.g., wiretapping laws). For example, HIPAA, as amended by HITECH, and their respective implementing regulations, impose specific requirements relating to the privacy, security, and transmission of individually identifiable health information. For more information regarding risks associated with HIPAA, please refer to the section above that discusses risks associated with federal and state healthcare laws.

In the past few years, numerous U.S. states – including California, Virginia, Colorado, Connecticut, and Utah—have enacted comprehensive privacy laws that impose certain obligations on covered businesses, including providing specific disclosures in privacy notices and affording residents with certain rights concerning their personal data. As applicable, such rights may include the right to access, correct, or delete certain personal data, and to opt-out of certain data processing activities, such as targeted advertising, profiling, and automated decision-making. The exercise of these rights may impact our business and ability to provide our products and services. Certain states also impose stricter requirements for processing certain personal data, including sensitive information, such as conducting data privacy impact assessments. These state laws allow for statutory fines for noncompliance. For example, the California Consumer Privacy Act of 2018, as amended by the California Privacy Rights Act of 2020 (collectively, the "CCPA") applies to personal information of consumers, business representatives, and employees who are California residents and requires businesses to provide specific disclosures in privacy notices and honor requests of California residents to exercise certain privacy rights. The CCPA allows for fines for noncompliance (up to $7,500 per intentional violation and allows private litigants affected by certain data breaches to recover significant statutory damages). While these laws exempt some data processed in the context of clinical trials, these developments further complicate compliance efforts and increase legal risk and compliance costs for us and the third parties with whom we work. Similar laws are being considered in several other states, as well as at the federal and local levels, and we expect more states to pass similar laws in the future.

Outside the United States, an increasing number of laws, regulations, and industry standards apply to data privacy and security. For example, the EU GDPR and the UK GDPR impose strict requirements for processing the personal data of individuals. For example, under the GDPR, companies may face temporary or definitive bans on data processing and other corrective actions; fines of up to 20 million euros under the EU GDPR, 17.5 million pounds sterling under the UK GDPR, or, in each case 4% of annual global revenue, whichever is greater; or private litigation related to the processing of personal data brought by classes of data subjects or consumer protection organizations authorized at law to represent their interests.

We may be unable to transfer personal data from Europe and other jurisdictions to the United States or other countries due to data localization requirements or limitations on cross-border data flows. Europe and other jurisdictions have enacted laws requiring data to be localized or limiting the transfer of personal data to other countries. In particular, the European Economic Area ("EEA") and the UK have significantly restricted the transfer of personal data to the United States and other countries whose privacy laws it generally believes are inadequate. Other jurisdictions may adopt similarly stringent interpretations of their data localization and cross-border data transfer laws. Although there are currently various mechanisms that may be used to transfer personal data from the EEA and UK to the United States in compliance with law, such as the EEA's standard contractual clauses the UK's International Data Transfer Agreement / Addendum, and the EU-U.S. Data Privacy Framework (which allows for transfers to relevant U.S.-based organizations who self-certify compliance and participate in the Framework), these mechanisms are subject to legal challenges, and there is no assurance that we can satisfy or rely on these measures to lawfully transfer personal data to the United States. If there is no lawful manner for us to transfer personal data from the EEA, the UK, or other jurisdictions to the United States, or if the requirements for a legally-compliant transfer are too onerous, we could face significant adverse consequences, including the interruption or degradation of our operations, the need to relocate part of or all of our business or data processing activities to other jurisdictions at significant expense, increased exposure to regulatory actions, substantial fines and penalties, the inability to transfer data and work with partners, vendors and other third parties, and injunctions against our processing or transferring of personal data necessary to operate our business. Additionally, companies that transfer personal data out of the EEA and UK to other jurisdictions, particularly to the United States, are subject to increased scrutiny from regulators, individual litigants, and activities groups. Some European regulators have ordered certain

companies to suspend or permanently cease certain transfers of personal data out of Europe for allegedly violating the GDPR's cross-border data transfer limitations.

In addition, privacy advocates and industry groups have proposed, and may propose in the future, standards with which we may be legally or contractually bound to comply. For example, we may also be subject to the Payment Card Industry Data Security Standard ("PCI DSS"). The PCI DSS requires companies to adopt certain measures to ensure the security of cardholder information, including using and maintaining firewalls, adopting proper password protections for certain devices and software, and restricting data access. Noncompliance with PCI-DSS can result in penalties ranging from $5,000 to $100,000 per month by credit card companies, litigation, damage to our reputation, and revenue losses. We may also rely on vendors to process payment card data, and those vendors may be subject to PCI DSS, and our business may be negatively affected if our vendors are fined or suffer other consequences as a result of PCI DSS noncompliance.

We are also subject to contractual obligations related to data privacy and security and our efforts to comply with such obligations may not be successful. We publish privacy policies, marketing materials, and other statements regarding data privacy and security. We may be subject to investigation or enforcement actions by regulators if those policies or statements are found to be deficient, lacking in transparency, deceptive, unfair, or misrepresentative of our practices.

Our data privacy and security obligations are quickly changing in an increasingly stringent fashion, creating some uncertainty as to the effective future legal framework. Additionally, these obligations may be subject to differing applications and interpretations, which may be inconsistent or in conflict among jurisdictions. Preparing for and complying with these obligations requires us to devote significant resources (including, without limitation, financial and time-related resources) and may necessitate changes to our services, information technologies, systems, and practices and to those of any third parties on with whom we work. If we or the third parties on with whom we work fail, or are perceived to have failed, to address or comply with data privacy and security obligations, we could face significant consequences. These consequences may include, but are not limited to, government enforcement actions (e.g., investigations, fines, penalties, audits, inspections, and similar); litigation (including class action claims) and mass arbitration demands; additional reporting requirements and/or oversight; bans or restrictions on processing personal data; orders to destroy or not use personal data; and imprisonment of company officials. In particular, plaintiffs have become increasingly more active in bringing privacy-related claims against companies, including class claims and mass arbitration demands. Some of these claims allow for the recovery of statutory damages on a per violation basis, and, if viable, carry the potential for monumental statutory damages, depending on the volume of data and the number of violations. Any of these events could have a material adverse effect on our reputation, business, or financial condition, including but not limited to, loss of customers; interruptions or stoppages in our business operations; inability to process personal data or to operate in certain jurisdictions; limited ability to develop or commercialize our products; expenditure of time and resources to defend any claim or inquiry; adverse publicity; or substantial changes to our business model or operations.

The life sciences research and diagnostic markets are highly competitive. If we fail to effectively compete, our business, financial condition and operating results will suffer.

We face significant competition in the life sciences research and diagnostic markets. We currently compete with both established and early stage companies that design, manufacture and market systems and consumable supplies. We believe our principal competitors in the life sciences research and genome mapping markets include PacBio, Oxford Nanopore Technologies, Genomic Vision, Qiagen, and Dovetail Genomics (now part of Cantata Bio). In addition, there are a number of new market entrants in the process of developing novel technologies for the life sciences research, diagnostic and screening markets.

Many of our current competitors are either publicly-traded, or are divisions of publicly-traded companies, and may enjoy a number of competitive advantages over us, including:

- greater name and brand recognition;
- substantially greater financial and human resources;
- broader product lines;
- larger sales forces and more established distributor networks;
- substantial intellectual property portfolios;
- larger and more established customer bases and relationships; and
- better established, larger scale, and lower cost manufacturing capabilities.

We believe that the principal competitive factors in all of our target markets include:

- cost of instruments and consumables;

- accuracy, including sensitivity and specificity, and reproducibility of results;
- reputation among customers and key opinion leaders;
- innovation in product offerings;
- flexibility, scalability and ease of use; and
- compatibility with existing laboratory processes, tools and methods.

We cannot assure investors that our products or technologies will compete favorably or that we will be successful in the face of increasing competition from new products and technologies introduced by our existing competitors or new companies entering our markets. In addition, we cannot assure investors that our competitors do not have or will not develop products or technologies that currently or in the future will enable them to produce competitive products or technologies with greater capabilities or at lower costs than ours. Any failure to compete effectively could materially and adversely affect our business, financial condition and operating results.

If we fail to comply with environmental, health and safety laws and regulations, we could become subject to fines or penalties or incur costs that could have a material adverse effect on the success of our business.

We, and any the third parties with access to our facilities, are subject to numerous environmental, health and safety laws and regulations, including those governing laboratory procedures and the handling, use, storage, treatment and disposal of hazardous materials and wastes. Each of our operations involve the use of hazardous and flammable materials, including chemicals and biological and radioactive materials. Our operations also produce hazardous waste. We generally contract with third parties for the disposal of these materials and wastes. We cannot eliminate the risk of contamination or injury from these materials. We could be held liable for any resulting damages in the event of contamination or injury resulting from the use of hazardous materials by us or the third parties with whom we contract, and any liability could exceed our resources. We also could incur significant costs associated with civil or criminal fines and penalties. Although we maintain workers' compensation insurance to cover us for costs and expenses we may incur due to injuries to our employees resulting from the use of hazardous materials, this insurance may not provide adequate coverage against potential liabilities. We do not maintain insurance for environmental liability or toxic tort claims that may be asserted against us in connection with our storage or disposal of biological, hazardous or radioactive materials. We do not have any insurance for liabilities arising from medical or hazardous materials. In addition, we may incur substantial costs in order to comply with current or future environmental, health and safety laws and regulations. Compliance with applicable environmental laws and regulations is expensive, and these current or future laws and regulations may impair our research, development and commercialization efforts, which could harm our business, prospects, financial condition or results of operations. Failure to comply with these laws and regulations also may result in substantial fines, penalties or other sanctions.

Risks related to government regulation and diagnostic product reimbursement

If the FDA ends enforcement discretion for Laboratory Developed Tests or determines that our RUO products are medical devices or if we seek to market our RUO products for clinical diagnostic or health screening use, we or our collaborators or customers will be required to obtain regulatory clearance(s) or approval(s), and we may be required to cease or limit sales of our then marketed products, which could materially and adversely affect our business, financial condition and results of operations. Any such regulatory process would be expensive, time-consuming and uncertain both in timing and in outcome.

Our RUO products are focused on the life sciences research market. This includes laboratories associated with academic and governmental research institutions, as well as pharmaceutical, biotechnology and contract research companies. Accordingly, our products are labeled as RUO, and are not intended for diagnostic use. While we have focused initially on the life sciences research market and RUO products only, our strategy is to expand our product line to encompass products that are intended to be used for the diagnosis of disease, either alone or in collaboration with third parties. Such IVD products will be subject to regulation by the FDA as medical devices, or comparable international agencies, including requirements for regulatory clearance or approval of such products before they can be marketed. If the FDA were to determine that our products are intended for clinical use or if we decided to market our products for such use, we would be required to obtain FDA 510(k) clearance or premarket approval in order to sell our products in a manner consistent with FDA laws and regulations. Such regulatory approval processes or clearances are expensive, time-consuming and uncertain; our efforts may never result in any approved premarket approval application, or PMA, or 510(k) clearance for our products; and failure by us or a collaborator to obtain or comply with such approvals and clearances could have an adverse effect on our business, financial condition or operating results.

IVD products may be regulated as medical devices by the FDA and comparable international agencies and may require either clearance from the FDA following the 510(k) pre-market notification process or PMA from the FDA, in each case prior to marketing. If we or our collaborators are required to obtain a PMA or 510(k) clearance for products based on our technology, we or they would be subject to a substantial number of additional requirements for medical devices, including establishment

registration, device listing, Quality Systems Regulations which cover the design, testing, production, control, quality assurance, labeling, packaging, servicing, sterilization (if required), and storage and shipping of medical devices (among other activities), product labeling, advertising, recordkeeping, post-market surveillance, post-approval studies, adverse event reporting, and correction and removal (recall) regulations. One or more of the products we or a collaborator may develop using our technology may also require clinical trials in order to generate the data required for PMA approval. Complying with these requirements may be time-consuming and expensive. We or our collaborators may be required to expend significant resources to ensure ongoing compliance with the FDA regulations and/or take satisfactory corrective action in response to enforcement action, which may have a material adverse effect on the ability to design, develop, and commercialize products using our technology as planned. Failure to comply with these requirements may subject us or a collaborator to a range of enforcement actions, such as warning letters, injunctions, civil monetary penalties, criminal prosecution, recall and/or seizure of products, and revocation of marketing authorization, as well as significant adverse publicity. If we or our collaborators fail to obtain, or experience significant delays in obtaining, regulatory approvals for IVD products, such products may not be able to be launched or successfully commercialized in a timely manner, or at all.

Laboratory developed tests, or LDTs, are a subset of IVD tests that are designed, manufactured and used within a single laboratory. Our Bionano Laboratories diagnostic services are provided as LDTs. The FDA maintains that LDTs are medical devices and has for the most part exercised enforcement discretion for most LDTs. A significant change in the way that the FDA regulates any LDTs that we, our collaborators or our customers market or develop using our technology could materially adversely affect our business. On May 6, 2024 FDA issued final regulations under which it intends to phase out its enforcement discretion approach to LDTs over a period of four years. We and our collaborators or customers will be required to obtain PMA approval or 510(k) clearance for certain tests by October 1, 2027. We will also become subject to device registration and listing requirements, medical device reporting requirements and the requirements of the FDA's Quality System Regulation. We may be required to conduct clinical trials to support any PMA approval. This may increase the cost of conducting, or otherwise harm, our business.

The cost and time required to commercialize tests presently marked as LDTs will increase substantially, and may reduce the financial incentive for us to continue to offer our Bionano Laboratories genetic diagnostic services or for our customer laboratories to develop LDTs, which could reduce demand for our RUO instruments and our other products. In addition, if the FDA were to change the way that it regulates LDTs to require that we undergo pre-market review or comply with other applicable FDA requirements before we can sell our RUO instruments or our other products to clinical cytogenetics laboratories, our ability to sell our RUO instruments and other products to this addressable market would be delayed, thereby impeding our ability to penetrate this market and generate revenue from sales of our instruments and our other products.

Failure to comply with applicable FDA requirements could subject us to misbranding or adulteration allegations under the Federal Food, Drug, and Cosmetic Act. We could be subject to a range of enforcement actions, including warning letters, injunctions, civil monetary penalties, criminal prosecution, and recall and/or seizure of products, as well as significant adverse publicity. In addition, changes to the current regulatory framework, including the imposition of additional or new regulations, could arise at any time during the development or marketing of our products, which may negatively affect our ability to obtain or maintain FDA or comparable regulatory approval of our products, if required.

Foreign jurisdictions have laws and regulations similar to those described above, which may adversely affect our ability to market our products as planned in such countries. The number and scope of these requirements are increasing. As in the United States, the cost and time required to comply with regulatory requirements may be substantial, and there is no guarantee that we will obtain the necessary authorization(s) required to make our products commercially viable. As a result, the imposition of foreign requirements may also have a material adverse effect on the commercial viability of our operations.

We expect to rely on third parties in conducting any required future studies of diagnostic products that may be required by the FDA or other regulatory authorities, and those third parties may not perform satisfactorily.

We do not have the ability to independently conduct clinical trials or other studies that may be required to obtain FDA and other regulatory clearance or approval for future diagnostic products. Accordingly, we expect that we would rely on third parties, such as clinical investigators, consultants, and collaborators to conduct such studies if needed. Our reliance on these third parties for clinical and other development activities would reduce our control over these activities. If these third parties do not successfully carry out their contractual duties or regulatory obligations or meet expected deadlines, if the third parties need to be replaced or if the quality or accuracy of the data they obtain is compromised, we may not be able to obtain regulatory clearance or approval.

Billing for our Bionano Laboratories diagnostic testing procedures is complex and requires substantial time and resources to collect payment.

Billing for clinical laboratory testing services in connection with our Bionano Laboratories diagnostic services is complex, time-consuming and expensive. Depending on the billing arrangement and applicable law, we bill various payors, including Medicare, Medicaid, private insurance companies, private healthcare institutions, and patients, all of which have different billing requirements. We generally bill third-party payors for our diagnostic testing services and pursue reimbursement on a case-by-case basis where pricing contracts are not in place. To the extent laws or contracts require us to bill patient co-payments or co-insurance, we must also comply with these requirements. We may also face increased risk in our collection efforts, including potential write-offs of accounts receivable and long collection cycles, which could adversely affect our business, results of operations and financial condition.

Several factors make the billing process complex, including:

- differences between the billing rates and reimbursement rates for our products;
- compliance with complex federal and state regulations related to billing government healthcare programs, including Medicare, Medicaid and TRICARE;
- risk of government audits related to billing;
- disputes among payors as to which party is responsible for payment;
- differences in coverage and information and billing requirements among payors, including the need for prior authorization and/or advanced notification;
- the effect of patient co-payments or co-insurance and our ability to collect such payments from patients;
- changes to billing codes used for our products;
- changes to requirements related to our current or future clinical studies, including our registry studies, which can affect eligibility for payment;
- ongoing monitoring provisions of LCDs for our products, which can affect the circumstances under which a claim would be considered medically necessary;
- incorrect or missing billing information; and
- the resources required to manage the billing and claims appeals process.

We use standard industry billing codes, known as CPT codes, to bill for our diagnostic testing services. If these codes were to change, there is a risk of an error being made in the claim adjudication process. Such errors can occur with claims submission, third-party transmission or in the processing of the claim by the payor. Claim adjudication errors may result in a delay in payment processing or a reduction in the amount of the payment we receive.

As we introduce new products, we may need to add new codes to our billing process as well as our financial reporting systems. Failure or delays in effecting these changes in external billing and internal systems and processes could negatively affect our collection rates, revenue and cost of collecting.

Additionally, our billing activities require us to implement compliance procedures and oversight, train and monitor our employees, and undertake internal audits to evaluate compliance with applicable laws and regulations as well as internal compliance policies and procedures. When payors deny our claims, we may challenge the reason, low payment amount or payment denials. Payors also conduct external audits to evaluate payments, which add further complexity to the billing process. If the payor makes an overpayment determination, there is a risk that we may be required to return all or some portion of prior payments we have received.

Additionally, the Patient Protection and Affordable Care Act of 2010, as amended by the Health Care and Education Reconciliation Act of 2010, collectively the ACA, requires providers and suppliers to report and return any overpayments received from government payors under the Medicare and Medicaid programs within 60 days of identification. Failure to identify and return such overpayments exposes the provider or supplier to liability under federal false claims laws. These billing complexities, and the related uncertainty in obtaining payment for our products, could negatively affect our revenue and cash flow, our ability to achieve sustained profitability, and the consistency and comparability of our results of operations.

If our Bionano Laboratories diagnostic testing procedures are subject to unfavorable pricing regulations or third-party payor coverage and reimbursement policies, our business could be harmed.

Our Bionano Laboratories-related revenue depends on achieving and maintaining broad coverage and adequate reimbursement for our Bionano Laboratories products and diagnostic assays from third-party payors, including both government and

commercial third-party payors. If third-party payors do not provide coverage of, or do not provide adequate reimbursement for, a substantial portion of the list price of our Bionano Laboratories products and diagnostic assays, we may need to seek additional payment from the patient beyond any co-payments and deductibles, which may adversely affect demand for our Bionano Laboratories products and diagnostic assays. Coverage determinations by a third-party payor may depend on a number of factors, including, but not limited to, a third-party payor's determination of whether our products or services are appropriate, medically necessary or cost-effective. If we are unable to provide third-party payors with sufficient evidence of the clinical utility and validity of our Bionano Laboratories products and diagnostic assays, they may not provide coverage, or may provide limited coverage, which will adversely affect our revenues and our ability to succeed.

Since each third-party payor makes its own decision as to whether to establish a policy to cover our Bionano Laboratories products and diagnostic assays, enter into a contract with us and set the amount it will reimburse for a product, these negotiations are a time-consuming and costly process, and they do not guarantee that the third-party payor will provide coverage or adequate reimbursement for our Bionano Laboratories products and diagnostic assays. In addition, the determinations by a third-party payor whether to cover our Bionano Laboratories products and diagnostic assays and the amount it will reimburse for them are often made on an indication-by-indication basis.

In cases where there is no coverage policy or we do not have a contracted rate for reimbursement as a participating provider, the patient is typically responsible for a greater share of the cost of the product, which may result in further delay of our revenue, increase our collection costs or decrease the likelihood of collection.

Our claims for reimbursement from third-party payors may be denied upon submission, and we may need to take additional steps to receive payment, such as appealing the denials. Such appeals and other processes are time-consuming and expensive, and may not result in payment. Third-party payors may perform audits of historically paid claims and attempt to recoup funds years after the funds were initially distributed if the third-party payors believe the funds were paid in error or determine that our Bionano Laboratories products and diagnostic assays were medically unnecessary. If a third-party payor audits our claims and issues a negative audit finding, and we are not able to overturn the audit findings through appeal, the recoupment may result in a material adverse effect on our revenue. Additionally, in some cases commercial third-party payors for whom we are not a participating provider may elect at any time to review claims previously paid and determine the amount they paid was too much. In these situations, the third-party payor will typically notify us of their decision and then offset whatever amount they determine they overpaid against amounts they owe us on current claims. We cannot predict when, or how often, a third-party payor might engage in these reviews and we may not be able to dispute these retroactive adjustments.

Additionally, coverage policies and third-party payor reimbursement rates may change at any time. Therefore, even if favorable coverage and reimbursement status is attained, less favorable coverage policies and reimbursement rates may be implemented in the future that may adversely affect the coverage and reimbursement of our Bionano Laboratories products and diagnostic assays.

If diagnostic procedures that are enabled by our OGM technology are subject to unfavorable pricing regulations or third-party payor coverage and reimbursement policies, our business could be harmed.

Currently, our OGM systems are for RUO, but clinical laboratories may acquire our instrumentation through a capital purchase or capital lease and use the OGM system and direct label stain chemistry to create their own potentially reimbursable products, such as laboratory developed tests for in vitro diagnostics. Our customers may generate revenue for these testing services by seeking the necessary approval of their product from the FDA or the Centers for Medicare & Medicaid Services, or CMS, along with coverage and reimbursement from third-party payors, including government health programs and private health plans. The ability of our customers to commercialize diagnostic tests based on our technology will depend in part on the extent to which coverage and reimbursement for these tests will be available from such third-party payors.

In the United States, molecular testing laboratories have multiple options for reimbursement coding, but we expect that the primary codes used will be the genomic sequencing procedure codes, or GSPs. The AMA added GSPs to its clinical laboratory fee schedule in 2015. In addition, CMS issued a coverage determination providing for the reimbursement of next-generation sequencing for certain cancer diagnostics using an FDA-approved in vitro diagnostic test. Private health plans often follow CMS coverage and reimbursement guidelines to a substantial degree, and it is difficult to predict what CMS will decide with respect to the coverage and reimbursement of any products our customers try to commercialize.

In Europe, coverage for molecular diagnostic testing is varied. Countries with statutory health insurance (e.g., Germany, France, The Netherlands) tend to be more progressive in technology adoption with favorable reimbursement for molecular diagnostic testing. In countries such as the United Kingdom with tax-based insurance, adoption and reimbursement for molecular diagnostic testing is not uniform and is influenced by local budgets.

Ultimately, coverage and reimbursement of new products is uncertain, and whether laboratories that use our instruments to develop their own products will attain coverage and adequate reimbursement is unknown. In the United States, there is no uniform policy for determining coverage and reimbursement. Coverage can differ from payor to payor, and the process for

determining whether a payor will provide coverage may be separate from the process for setting the reimbursement rate. In addition, the U.S. government, state legislatures and foreign governments have shown significant interest in implementing cost containment programs to limit the growth of government-paid healthcare costs, including price controls and restrictions on reimbursement. We cannot be sure that coverage will be available for any diagnostic tests based on our technology, and, if coverage is available, the level of payments. Reimbursement may impact the demand for those tests. If coverage and reimbursement is not available or is available only to limited levels, our customers may not be able to successfully commercialize any tests for which they receive marketing authorization.

Healthcare legislative or regulatory reform measures may have a negative impact on our business and results of operations.

In March 2010, the ACA became law. The ACA is a sweeping law intended to broaden access to health insurance, reduce or constrain the growth of healthcare spending, enhance remedies against fraud and abuse, add new transparency requirements for the healthcare and health insurance industries, impose new taxes and fees on the health industry and impose additional health policy reforms. For example, the ACA contained a 2.3% excise tax on certain entities that manufacture or import medical devices offered for sale in the United States, with limited exceptions, which has been permanently eliminated as part of the 2020 spending package.

There have been executive, judicial and Congressional challenges to certain aspects of the ACA. For example, on June 17, 2021 the U.S. Supreme Court dismissed a challenge on procedural grounds that argued the ACA was unconstitutional in its entirety because the "individual mandate" was repealed by Congress.

In addition, other legislative changes have been proposed and adopted since the ACA was enacted. On August 16, 2022, President Biden signed the IRA into law, which among other things, extends enhanced subsidies for individuals purchasing health insurance coverage in ACA marketplaces through plan year 2025. The IRA also eliminates the coverage gap under the Medicare Part D program beginning in 2025 by significantly lowering the beneficiary maximum out-of-pocket cost and through a newly established manufacturer discount program. In addition, on April 1, 2014, the Protecting Access to Medicare Act of 2014, or PAMA, was signed into law, which, among other things, significantly altered the payment methodology under the Medicare Clinical Laboratory Fee Schedule, or CLFS. PAMA requires certain laboratories performing clinical diagnostic laboratory tests to report to CMS the amounts paid by private payors for laboratory tests. Such reporting has been subject to numerous delays. Beginning on January 1, 2018, CMS has begun using reported private payor pricing to periodically revise payment rates under the CLFS. Based on current law, between January 1, 2025 and March 31, 2025, applicable laboratories will be required to report on data collected during January 1, 2019 and June 30, 2019. This data will be utilized to determine 2025 to 2027 CLFS rates.

We expect that the ACA, as well as other healthcare reform measures that may be adopted in the future, may result in more rigorous coverage criteria and additional downward pressure on the price that we or our collaborators will receive for any cleared or approved product. Any reduction in payments from Medicare or other government programs may result in a similar reduction in payments from private payors. The implementation of cost containment measures or other healthcare reforms may prevent our customers from successfully commercializing any tests for which they receive approval, which could prevent us from being able to generate revenue and attain profitability.

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

We are subject to the Clinical Laboratory Improvement Amendment of 1988, or CLIA, which is a federal law regulating clinical laboratories that perform testing on specimens derived from humans for the purpose of providing information for the diagnosis, prevention or treatment of disease. Our clinical laboratory is located in Utah and must be certified under CLIA in order for us to perform testing on human specimens. CLIA is intended to ensure the quality and reliability of clinical laboratories in the United States by mandating specific standards in the areas of personnel qualifications, administration, and participation in proficiency testing, patient test management, quality control, quality assurance and inspections. We have a current certificate of compliance under CLIA to perform cytogenetics. To renew this certificate, we are subject to survey and inspection every two years. Moreover, CLIA inspectors may make periodic inspections of our clinical laboratory outside of the renewal process. The failure to comply with CLIA requirements can result in enforcement actions, including the revocation, suspension, or limitation of our CLIA certificate of compliance, as well as a directed plan of correction, state on-site monitoring, civil money penalties, civil injunctive suit and/or criminal penalties. We must maintain CLIA compliance and certification to be eligible to bill for assays provided to Medicare beneficiaries. If we were to be found out of compliance with CLIA program requirements and subjected to sanctions, our business and reputation could be harmed. Even if it were possible for us to bring our laboratory back into compliance, we could incur significant expenses and potentially lose revenue in doing so.

We hold laboratory licenses from the states of California, Pennsylvania, and Maryland, to test specimens from patients in those states or received from ordering physicians in those states. Other states may have similar requirements or may adopt similar

requirements in the future. Finally, we may be subject to regulation in foreign jurisdictions if we seek to expand international distribution of our assays outside the United States.

If we were to lose our CLIA certification or state laboratory licenses, whether as a result of a revocation, suspension or limitation, we would no longer be able to offer our assays, which would limit our revenues and harm our business. If we were to lose, or fail to obtain, a license in any other state where we are required to hold a license, we would not be able to test specimens from those states. Additionally, if we were to lose our CAP accreditation, our reputation for quality, as well as our business, financial condition and results of operations, could be significantly and adversely affected.

We are subject to federal and state healthcare fraud and abuse laws and other federal and state laws applicable to our business activities, including our marketing practices. If we are unable to comply, or have not complied, with such laws, we could face substantial penalties.

Our operations are subject to various federal and state fraud and abuse laws, including, without limitation, the federal and state anti-kickback statutes and false claims laws. These laws may impact, among other things, our sales and marketing and education programs, and our financial and business relationships with health care professionals. The laws that may affect our ability to operate include, but are not limited to:

- the federal Anti-Kickback Statute (the "AKS"), which prohibits, among other things, any person or entity from knowingly and willfully soliciting, receiving, offering or paying any remuneration, directly or indirectly, overtly or covertly, in cash or in kind, to induce or reward either the referral of an individual for, or the purchase, order or recommendation of an item or service reimbursable, in whole or in part, under a federal healthcare program, such as the Medicare and Medicaid programs. The term ''remuneration'' has been broadly interpreted to include anything of value. There are a number of statutory exceptions and regulatory safe harbors protecting some common activities from prosecution, however these are drawn narrowly. Additionally, a person or entity does not need to have actual knowledge of the statute or specific intent to violate it in order to have committed a violation. In addition, the ACA codified case law that a claim including items or services resulting from a violation of the AKS constitutes a false or fraudulent claim for purposes of the FCA;
- the Stark Law, which prohibits a physician from making a referral for certain designated health services covered by the Medicare or Medicaid program, including laboratory and pathology services, if the physician or an immediate family member of the physician has a financial relationship with the entity providing the designated health services and prohibits that entity from billing, presenting or causing to be presented a claim for the designated health services furnished pursuant to the prohibited referral, unless an exception applies;
- federal civil and criminal false claims laws and civil monetary penalty laws, such as the FCA, which can be enforced by private citizens through civil qui tam actions, prohibits individuals or entities from, among other things, knowingly presenting, or causing to be presented false, fictitious or fraudulent claims for payment or approval by the federal government, including federal health care programs, such as Medicare and Medicaid, and knowingly making, using or causing to be made or used a false record or statement material to a false or fraudulent claim, or knowingly making a false statement to improperly avoid, decrease or conceal an obligation to pay money to the federal government;
- EKRA prohibits payments for referrals to recovery homes, clinical treatment facilities, and laboratories. EKRA's reach extends beyond federal health care programs to include private insurance (i.e., it is an "all payor" statute). For purposes of EKRA, the term "laboratory" is defined broadly and without reference to any connection to substance use disorder treatment. The law includes a limited number of exceptions, some of which closely align with corresponding federal Anti-Kickback Statute exceptions and safe harbors, and others that materially differ;
- HIPAA, which, among other things, imposes criminal liability for executing or attempting to execute a scheme to defraud any healthcare benefit program, including private third-party payors, knowingly and willfully embezzling or stealing from a healthcare benefit program, willfully obstructing a criminal investigation of a healthcare offense, and knowingly and willfully falsifying, concealing or covering up a material fact or making any materially false, fictitious or fraudulent statement or representation, in connection with the delivery of or payment for healthcare benefits, items or services. Like the AKS, a person or entity does not need to have actual knowledge of the statute or specific intent to violate it in order to have committed a violation;
- HIPAA, as amended by HITECH, and their implementing regulations, which imposes privacy, security and breach reporting obligations with respect to individually identifiable health information upon entities subject to the law, such as health plans, healthcare clearinghouses and certain healthcare providers, known as covered entities, and their respective business associates, individuals or entities that perform services for them that involve individually identifiable health information as well as their covered subcontractors;
- state laws that prohibit other specified practices, such as billing physicians for tests that they order or providing tests at no or discounted cost to induce physician or patient adoption; insurance fraud laws; waiving coinsurance, co-

payments, 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 third-party payors employing, exercising control over or splitting professional fees with licensed professionals in violation of state laws prohibiting fee splitting or the corporate practice of medicine and other professions;

- federal and state consumer protection and unfair competition laws, which broadly regulate marketplace activities and activities that potentially harm consumers;
- the prohibition on reassignment of Medicare claims, which, subject to certain exceptions, precludes the reassignment of Medicare claims to any other party;
- state and foreign law equivalents of each of the above federal laws, such as anti-kickback and false claims laws, that may impose similar or more prohibitive restrictions, and may apply to items or services reimbursed by any non-governmental third-party payors, including private insurers; and
- federal, state, local and foreign laws that govern the data privacy and security of health information in certain circumstances, including state health information privacy and data breach notification laws which govern the collection, use, disclosure, and protection of health-related personal data, many of which differ from each other in significant ways and often are not pre-empted by HIPAA, thus complicating compliance efforts.

As a clinical laboratory, our business practices may face additional scrutiny from government regulatory agencies such as the Department of Justice, the U.S. Department of Health and Human Services Office of Inspector General ("OIG"), and CMS. Certain arrangements between clinical laboratories and referring physicians have been identified in fraud alerts issued by the OIG as implicating the AKS. The OIG has stated that it is particularly concerned about these types of arrangements because the choice of laboratory, as well as the decision to order laboratory tests, typically are made or strongly influenced by the physician, with little or no input from patients. Moreover, the provision of payments or other items of value by a clinical laboratory to a referral source could be prohibited under the Stark Law unless the arrangement meets all criteria of an applicable exception. The government has been active in enforcement of these laws as they apply to clinical laboratories.

We have entered into consulting and scientific advisory board arrangements, speaking arrangements and clinical research agreements with physicians and other healthcare providers, including some who could influence the use of our products. Although we believe that these have been structured in compliance with applicable laws, because of the complex and far-reaching nature of these laws, regulatory agencies may view these transactions as prohibited arrangements that must be restructured, or discontinued, or for which we could be subject to other significant penalties. We could be adversely affected if regulatory agencies interpret our financial relationships with providers who may influence the ordering of and use of our products to be in violation of applicable laws.

Ensuring that our business arrangements with third parties comply with applicable healthcare laws and regulations is costly. If our operations are found to be in violation of any of these laws, we may be subject to significant penalties, including, without limitation, civil, criminal, and administrative penalties, damages, fines, disgorgement, the curtailment or restructuring of our operations, exclusion from participation in federal and state healthcare programs, additional integrity oversight and reporting obligations, imprisonment, contractual damages, and reputational harm, any of which could adversely affect our ability to operate our business and our results of operations. If any of the physicians or other healthcare providers or entities with whom we do business is found to be not in compliance with applicable laws, they may be subject to criminal, civil or administrative sanctions, including exclusions from government funded healthcare programs.

Additionally, sales of our products outside of the United States will subject us to similar foreign regulatory requirements, all of which are far-reaching and complex, and our failure to comply with such regulatory requirements could result in substantial penalties and have a material adverse effect on our business.

We are subject to U.S. and foreign anti-corruption and anti-money laundering laws with respect to our operations and non-compliance with such laws can subject us to criminal and/or civil liability and harm our business.

We are subject to the U.S. FCPA, the U.S. domestic bribery statute contained in 18 U.S.C. § 201, the U.S. Travel Act, the USA PATRIOT Act, the United Kingdom Bribery Act 2010, and other state and national anti-bribery and anti-money laundering laws in countries in which we conduct activities. Anti-corruption laws are interpreted broadly and prohibit companies and their employees and third-party intermediaries from authorizing, promising, offering, providing, soliciting, or accepting, directly or indirectly, improper payments or benefits to or from any person whether in the public or private sector for the purpose of obtaining or retaining business or securing any other improper advantage. We rely on third-party representatives, distributors, and other business partners to support sales of our products and services and our efforts to ensure regulatory compliance. In addition, as we increase our international sales and business, we may engage with additional business partners. We can be held liable for the corrupt or other illegal activities of our employees, representatives, contractors, business partners, and agents, even if we do not explicitly authorize or have actual knowledge of such activities.

Any violations of anti-corruption and anti-money laundering 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.

We are subject to governmental export and import controls that could impair our ability to compete in international markets due to licensing requirements and subject us to liability if we are not in compliance with applicable laws.

Our products are subject to export control and import laws and regulations, including the U.S. Export Administration Regulations, U.S. Customs regulations, and various economic and trade sanctions regulations administered by the U.S. Treasury Department's Office of Foreign Assets Controls. Exports of our products must be made in compliance with these laws and regulations. If we fail to comply with these laws and regulations, we and certain of our employees could be subject to substantial civil or criminal penalties, including the possible loss of export or import privileges; fines, which may be imposed on us and responsible employees or managers; and, in extreme cases, the incarceration of responsible employees or managers.

In addition, changes in our products or changes in applicable export or import laws and regulations may create delays in the introduction and sale of our products in international markets, prevent our customers from deploying our products or, in some cases, prevent the export or import of our products to certain countries, governments or persons altogether. Any change in export or import laws and regulations, shift in the enforcement or scope of existing laws and regulations, or change in the countries, governments, persons or technologies targeted by such laws and regulations, could also result in decreased use of our products, or in our decreased ability to export or sell our products to existing or potential customers. Any decreased use of our products or limitation on our ability to export or sell our products would likely adversely affect our business, financial condition and results of operations.

Risks related to intellectual property

If we are unable to protect our intellectual property, it may reduce our ability to maintain any technological or competitive advantage over our competitors and potential competitors, and our business may be harmed.

We rely on patent protection as well as trademark, copyright, trade secret and other intellectual property rights protection and contractual restrictions to protect our proprietary technologies, all of which provide limited protection and may not adequately protect our rights or permit us to gain or keep any competitive advantage. We have developed a global patent portfolio that includes more than 150 issued patents across approximately 39 patent families that are either owned or exclusively licensed. The owned and licensed patent families contain issued patents and pending applications that relate to devices, systems, and methods for macromolecular analysis, isolation and purification of molecules, genetic testing, computer software systems and reflect our active and ongoing research programs. We also were the assignee of more than 50 pending patent applications in and outside the United States. If we fail to protect and/or maintain our intellectual property, third parties may be able to compete more effectively against us, we may lose our technological or competitive advantage, and/or we may incur substantial litigation costs in our attempts to recover or restrict use of our intellectual property.

We cannot assure investors that any of our currently pending or future patent applications will result in granted patents, and we cannot predict how long it will take for such patents to issue, if at all. It is possible that, for any of our patents that have issued or that may issue in the future, our competitors may design their products, technologies or services around our patented technologies. Further, we cannot assure investors that other parties will not challenge any patents granted to us, or that courts or regulatory agencies will hold our patents to be valid, enforceable, and/or infringed. We cannot guarantee investors that we will be successful in defending challenges made against our patents and patent applications. Any successful third-party challenge or challenges to our patents could result in the unenforceability or invalidity of such patents, or such patents being interpreted narrowly and/or in a manner adverse to our interests. Our ability to establish or maintain a technological or competitive advantage over our competitors and/or market entrants may be diminished because of these uncertainties. For these and other reasons, our intellectual property may not provide us with any competitive advantage. For example:

- we or our licensors might not have been the first to make the inventions claimed or disclosed by our pending patent applications or issued patents;
- we or our licensors might not have been the first to file patent applications for these inventions. To determine the priority of these inventions, we may have to participate in interference proceedings or derivation proceedings declared by the U.S. Patent and Trademark Office, or the USPTO, which could result in substantial cost to us, and could possibly result in a loss or narrowing of patent rights. No assurance can be given that our or our licensors' patent applications or granted patents will have priority over any other patent or patent application involved in such a proceeding, or will be held valid as an outcome of the proceeding;
- other parties may independently develop similar or alternative products and technologies or duplicate any of our products and technologies, which can potentially impact our market share, revenue, and goodwill, regardless of whether intellectual property rights are successfully enforced against these other parties;

- it is possible that our owned or licensed pending patent applications will not result in granted patents, and even if such pending patent applications issue as patents, they may not provide intellectual property protection of commercially viable products or product features, may not provide us with any competitive advantages, or may be challenged and invalidated by third parties, patent offices, and/or the courts;
- we may be unaware of or unfamiliar with prior art and/or interpretations of prior art that could potentially impact the validity or scope of our patents or pending patent applications, or patent applications that we intend to file;
- we take efforts to enter into agreements with employees, consultants, collaborators, and, as applicable, advisors to confirm ownership and chain of title in intellectual property rights. However, an inventorship or ownership dispute could arise that may permit one or more third parties to practice or enforce our intellectual property rights, including possible efforts to enforce rights against us;
- we may elect not to maintain or pursue intellectual property rights that, at some point in time, may be considered relevant to or enforceable against a competitor;
- we may not develop additional proprietary products and technologies that are patentable, or we may develop additional proprietary products and technologies that are not patentable;
- the patents or other intellectual property rights of others may have an adverse effect on our business; and
- we apply for patents relating to our products and technologies and uses thereof, as we deem appropriate. However, we or our representatives or their agents may fail to apply for patents on important products and technologies in a timely fashion or at all, or we or our representatives or their agents may fail to apply for patents in potentially relevant jurisdictions.

To the extent our intellectual property offers inadequate protection, or is found to be invalid or unenforceable, we would be exposed to a greater risk of direct or indirect competition. If our intellectual property does not provide adequate coverage of our competitors' products, technologies or services, our competitive position could be adversely affected, as could our business.

Further, to the extent that computation methods implemented by software included in our products or technologies are not protected by our patents, our dependence on copyright and trade secret protection may not provide adequate protection. In addition, the Supreme Court's ruling in Alice Corporation Pty. Ltd. v. CLS Bank International has narrowed the scope of patent protection available for computational methods in certain circumstances.

The measures that we use to protect the security of our intellectual property and other proprietary rights may not be adequate, which could result in the loss of legal protection for, and thereby diminish the value of, such intellectual property and other rights.

In addition to pursuing patents on our technologies, we also rely upon trademarks, trade secrets, copyrights and unfair competition laws, as well as license agreements and other contractual provisions, to protect our intellectual property and other proprietary rights. Despite these measures, any of our intellectual property rights could be challenged, invalidated, circumvented or misappropriated. In addition, we take steps to protect our intellectual property and proprietary technologies by entering into confidentiality agreements and intellectual property assignment agreements with our employees, consultants, corporate partners and, when needed, our advisors. Such agreements may not be enforceable or may not provide meaningful protection for our trade secrets and/or other proprietary information in the event of unauthorized use or disclosure or other breaches of the agreements, and we may not be able to prevent such unauthorized disclosure. Moreover, if a party having an agreement with us has an overlapping or conflicting obligation to a third party, our rights in and to certain intellectual property could be undermined. Monitoring unauthorized and inadvertent disclosure is difficult, and we do not know whether the steps we have taken to prevent such disclosure are, or will be, adequate. If we were to enforce a claim that a third party had illegally obtained and was using our trade secrets, it would be expensive and time consuming, the outcome would be unpredictable, and any remedy may be inadequate. In addition, courts outside the United States may be less willing to protect trade secrets.

In addition, competitors could purchase our products or technologies and attempt to replicate and/or improve some or all of the competitive advantages we derive from our development efforts, willfully infringe our intellectual property rights, design their products or technologies around our protected technologies or develop their own competitive technologies that fall outside of our intellectual property rights. If our intellectual property does not adequately protect our market share against competitors' products or technologies, services and methods, our competitive position could be adversely affected, as could our business.

We have rights in some intellectual property that has been discovered through government funded programs and thus is subject to federal regulations such as "march-in" rights, certain reporting requirements, and a preference for U.S. industry. Compliance with such regulations may limit our exclusive rights, subject us to expenditure of resources with respect to reporting requirements, and limit our ability to contract with non-U.S. manufacturers.

Some of the intellectual property rights assigned to us and/or in-licensed to us have been generated through the use of U.S. government funding and are therefore subject to certain federal regulations. For example, all of the intellectual property rights licensed to us under our license agreement with Princeton University have been generated using U.S. government funds. As a result, the U.S. government has certain rights to intellectual property embodied in our current or future products pursuant to the Bayh-Dole Act of 1980. These U.S. government rights in certain inventions developed under a government-funded program include a non-exclusive, non-transferable, irrevocable worldwide license to use inventions for any governmental purpose. In addition, the U.S. government has the right to require us to grant exclusive, partially exclusive, or non-exclusive licenses to any of these inventions to a third-party if the government determines that: (i) adequate steps have not been taken to commercialize the invention; (ii) government action is necessary to meet public health or safety needs; or (iii) government action is necessary to meet requirements for public use under federal regulations (also referred to as "march-in rights"). The U.S. government also has the right to take title to these inventions if we fail, or the applicable licensor fails, to disclose the invention to the government, elect title, and file an application to register the intellectual property within specified time limits. In addition, the U.S. government may acquire title to these inventions in any country in which a patent application is not filed within specified time limits. Intellectual property generated under a government funded program is also subject to certain reporting requirements, compliance with which may require us, or the applicable licensor, to expend substantial resources. In addition, the U.S. government requires that any products embodying the subject invention or produced through the use of the subject invention be manufactured substantially in the United States. The manufacturing preference requirement can be waived if the owner of the intellectual property can show that reasonable but unsuccessful efforts have been made to grant licenses on similar terms to potential licensees that would be likely to manufacture substantially in the United States or that, under the circumstances, domestic manufacture is not commercially feasible. This preference for U.S. manufacturing may limit our ability to license the applicable patent rights on an exclusive basis under certain circumstances.

If we enter into future arrangements involving government funding, and we make or license inventions that result from such funding, intellectual property rights to such discoveries may be subject to the applicable provisions of the Bayh-Dole Act. To the extent any of our current or future intellectual property is generated through the use of U.S. government funding, the provisions of the Bayh-Dole Act may similarly apply. Any exercise by the government of certain of its rights could harm our competitive position, business, financial condition, results of operations and prospects.

We depend on technology that is licensed to us by Princeton University. Any loss of our rights to this technology could prevent us from selling our products.

Some technology that relates to analysis of nucleic acids is licensed exclusively to us from Princeton University, or Princeton. We do not own the patents that underlie this license. Our rights to use this technology and employ the inventions claimed in the licensed patents are subject to the continuation of and compliance with the terms of the license. Our principal obligations under our license agreement with Princeton are as follows:

- royalty payments;
- annual maintenance fees;
- using commercially reasonable efforts to develop and sell a product using the licensed technology and developing a market for such product;
- paying and/or reimbursing fees related to prosecution, maintenance and enforcement of patent rights; and
- providing certain reports.

If we breach any of these obligations, Princeton may have the right to terminate or modify the license, which could result in our being unable to develop, manufacture and sell our products or a competitor gaining access to the relevant technology. Termination or certain modifications of our license agreement with Princeton would have a material adverse effect on our business.

In addition, we are a party to a number of other agreements that include licenses to intellectual property, including non-exclusive licenses. We may need to enter into additional license agreements in the future. Our business could suffer, for example, if any current or future licenses terminate, if the licensors fail to abide by the terms of the license, if the licensed patents or other rights are found to be invalid or unenforceable, or if we are unable to enter into necessary licenses on acceptable terms.

As we have done previously, we may need or may choose to obtain licenses and/or acquire intellectual property rights from third parties to advance our research or begin commercialization of our current or future products or services, and we cannot

provide any assurances that third-party patents do not exist that might be enforced against our current or future products or services in the absence of such a license. We may fail to obtain any of these licenses or intellectual property rights on commercially reasonable terms. Even if we are able to obtain a license, it may be non-exclusive, thereby giving our competitors access to the same technologies licensed to us. In that event, we may be required to expend significant time and resources to develop or license replacement technology. If we are unable to do so, we may be unable to develop or commercialize the affected products or services, which could materially harm our business and the third parties owning such intellectual property rights could seek either an injunction prohibiting our sales, or, with respect to our sales, an obligation on our part to pay royalties and/or other forms of compensation.

Licensing of intellectual property is important to our business and involves complex legal, business and scientific issues. Disputes may arise between us and our licensors regarding intellectual property subject to a license agreement, including:

- the scope of rights granted under the license agreement and other interpretation-related issues;
- whether and the extent to which our technologies and processes infringe any intellectual property of the licensor that is not subject to the licensing agreement;
- whether to take action to enforce any intellectual property rights against an allegedly infringing product or process of a third-party;
- our right to sublicense patent and other rights to third parties;
- our diligence obligations with respect to the use of licensed technology in relation to our development and commercialization of our products and services, and what activities satisfy those diligence obligations; and
- the ownership of inventions and know-how, such as intellectual property resulting from the joint creation or use of intellectual property by our licensors and us and our partners.

If disputes over intellectual property that we have licensed prevent or impair our ability to maintain our current licensing arrangements on acceptable terms, we may be unable to successfully develop and commercialize the affected product or service, or the dispute may have an adverse effect on our results of operation.

In addition to agreements pursuant to which we in-license intellectual property, we may in the future grant licenses under our intellectual property, or sell certain intellectual property. Like in-licenses, out-licenses can be complex and disputes may arise between us and our licensees, such as the types of disputes described above. Moreover, licensees may breach their obligations, or we may be exposed to liability due to our failure or alleged failure to satisfy our obligations. Any such occurrence could have an adverse effect on our business.

If we or any of our partners is sued for infringing intellectual property rights of third parties, it would be costly and time consuming, and an unfavorable outcome in that litigation could have a material adverse effect on our business.

Our success also depends on our ability to develop, manufacture, market and sell our products and technologies and perform our services without infringing the proprietary rights of third parties. Numerous U.S. and foreign-issued patents and pending patent applications owned by third parties exist in the fields in which we are developing manufacturing, marketing and selling products and technologies and performing services. As part of a business strategy to impede our successful commercialization and entry into new markets, competitors may allege that our products, technologies and/or services infringe their intellectual property rights.

We could incur substantial costs and divert the attention of our management and technical personnel in defending ourselves against claims of infringement made by third parties. Any adverse ruling by a court or administrative body, or perception of an adverse ruling, may have a material adverse impact on our ability to conduct our business and our finances. Moreover, third parties making claims against us may be able to obtain injunctive relief against us, which could block our ability to offer one or more products, technologies or services and could result in a substantial award of damages against us. In addition, since we sometimes indemnify customers, collaborators or licensees, we may have additional liability in connection with any infringement or alleged infringement of third-party intellectual property. Intellectual property litigation can be very expensive, and we may not have the financial means to defend ourselves or our customers, collaborators and licensees.

Because patent applications can take many years to issue, there may be pending applications, some of which are unknown to us, that may result in issued patents upon which our products, services or proprietary technologies may infringe. Moreover, we may fail to identify issued patents of relevance or incorrectly conclude that an issued patent is invalid or not infringed any of our products, services or proprietary technologies. There is a substantial amount of litigation involving patents and other intellectual property rights in our industry. If a third party claims that we or any of our licensors, customers or collaboration partners infringe upon a third-party's intellectual property rights, we may have to:

- seek to obtain licenses that may not be available on commercially reasonable terms, if at all;

- abandon any product or service alleged or held to infringe, or redesign our products or technologies or processes to avoid potential assertion of infringement;
- pay substantial damages including, in exceptional cases, treble damages and attorneys' fees, which we may have to pay if a court decides that the product or proprietary technology at issue infringes upon or violates the third-party's rights;
- pay substantial royalties or fees for, or grant cross-licenses to, our technology; or
- defend litigation or administrative proceedings that may be costly whether we win or lose, and which could result in a substantial diversion of our financial and management resources.

We may be involved in lawsuits to protect or enforce our patents or the patents of our licensors, which could be expensive, time-consuming and unsuccessful.

Competitors may infringe our patents or the patents we license in. In the event of infringement or unauthorized use, we may file one or more infringement lawsuits, which can be expensive and time-consuming. An adverse result in any such litigation proceedings could put one or more of our patents at risk of being invalidated, being found to be unenforceable, and/or being interpreted narrowly and could put our patent applications at risk of not issuing and/or could impact the validity or enforceability positions of our other patents or those we license. Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation, there is a risk that some of our confidential information could be compromised by disclosure during this type of litigation.

Most of our competitors are larger than we are and have substantially greater resources. They are, therefore, likely to be able to sustain the costs of complex patent litigation longer than we could. In addition, the uncertainties associated with litigation could have a material adverse effect on our ability to raise the funds necessary to continue our operations, continue our internal research programs, in-license needed technology, pursue, obtain or maintain intellectual property rights, or enter into development partnerships that would help us bring our products, technologies or services to market.

In addition, patent litigation can be very costly and time-consuming. An adverse outcome in such litigation or proceedings may expose us or any of our future development partners to loss of our proprietary position, expose us to significant liabilities, or require us to seek licenses that may not be available on commercially acceptable terms, if at all.

Our issued patents could be found invalid or unenforceable if challenged in court or at the Patent Office or other administrative agency, which could have a material adverse impact on our business.

If we or any of our partners were to initiate legal proceedings against a third-party to enforce a patent related to one of our products, technologies or services, the defendant in such litigation could counterclaim that our patent is invalid and/or unenforceable. In patent litigation in the United States, defendant counterclaims alleging invalidity and/or unenforceability are commonplace, as are validity challenges by the defendant against the subject patent or other patents before the USPTO. Grounds for a validity challenge could be an alleged failure to meet any of several statutory requirements, including lack of novelty, obviousness or non-enablement, failure to meet the written description requirement, indefiniteness, and/or failure to disclose the best mode or to claim patent eligible subject matter. Grounds for an unenforceability assertion could be an allegation that someone connected with prosecution of the patent intentionally withheld material information from the USPTO, or made a misleading statement, during prosecution. Additional grounds for an unenforceability assertion include an allegation of misuse or anticompetitive use of patent rights, and an allegation of incorrect inventorship with deceptive intent. Third parties may also raise similar claims before the USPTO even outside the context of litigation. The outcome is unpredictable following legal assertions of invalidity and unenforceability. With respect to the validity question, for example, we cannot be certain that no invalidating prior art existed of which we and the patent examiner were unaware during prosecution. These assertions may also be based on information known to us or the USPTO. If a defendant or third party were to prevail on a legal assertion of invalidity and/or unenforceability, we would lose at least part, and perhaps all, of the claims of the challenged patent. Such a loss of patent protection would or could have a material adverse impact on our business.

We may be subject to claims that our employees, consultants or independent contractors have wrongfully used or disclosed alleged trade secrets of their other clients or former employers to us, and/or that their other clients or former employers allegedly have rights in our intellectual property, which could subject us to costly litigation.

As is common in the life sciences industry, we engage the services of consultants and independent contractors to assist us in the development of our products, technologies and services. Many of these consultants and independent contractors were previously employed at, or may have previously or may be currently providing consulting or other services to, universities or other technology, biotechnology or pharmaceutical companies, including our competitors or potential competitors. We may become subject to claims that our company, a consultant or an independent contractor inadvertently or otherwise used or disclosed trade secrets or other information proprietary to their former employers or their former or current clients. We may similarly be subject to claims stemming from similar actions of an employee, such as one who was previously employed by

another company, including a competitor or potential competitor. We may become subject to claims that one or more current or former employees, consultants, advisors, or independent contractors of ours owns rights in our intellectual property and/or has assigned or is under an obligation to assign rights in our intellectual property to another party. This may include a competitor of ours. If a competitor has rights in our patents, the competitor or a licensee or related entity of the competitor may be able to make, use, sell, import, and/or export the patented technology without liability to us under our patents or the patents we license. Litigation may be necessary to defend against these claims. Even if we are successful in defending against these claims, litigation could result in substantial costs and be a distraction to our management team. If we were not successful, we could lose valuable intellectual property rights.

We may be subject to claims challenging the inventorship or ownership of our patents and other intellectual property.

We generally enter into confidentiality and intellectual property assignment agreements with our employees, consultants, contractors, and, as applicable, advisors. These agreements generally provide that inventions conceived by the party in the course of rendering services to us will be our exclusive property. However, those agreements may not be honored and may not effectively assign or may be alleged to ineffectively assign intellectual property rights to us. For example, even if we have a consulting agreement in place with an academic advisor pursuant to which such academic advisor is required to assign any inventions developed in connection with providing services to us, such academic advisor may not have the right to assign such inventions to us, as it may conflict with his or her obligations to assign all such intellectual property to his or her employing institution.

In addition, we sometimes enter into agreements where we provide services to third parties, such as customers. Under such circumstances, our agreements may provide that certain intellectual property that we conceive in the course of providing those services is assigned to the customer. In those cases, we may not be able to use that particular intellectual property in, for example, our work for other customers without a license.

We may not be able to protect our intellectual property rights throughout the world, which could materially and negatively affect our business.

Filing, prosecuting, maintaining, and defending patents on current and future products, technologies and services in all countries throughout the world would be prohibitively expensive, and our intellectual property rights in some countries outside the United States can be less extensive than those in the United States. In addition, the laws of some foreign countries do not protect intellectual property rights to the same extent as federal and state laws in the United States. Consequently, regardless of whether we are able to prevent third parties from practicing our inventions in the United States, we may not be able to prevent third parties from practicing our inventions in all countries outside the United States, or from selling or importing products made using our inventions in and into the United States or other jurisdictions. Competitors may use our technologies in jurisdictions where we have not pursued and obtained patent protection to develop their own products, technologies or services, and further, may export otherwise infringing products or technologies to territories where we have patent protection, but enforcement is not as strong as it is in the United States. These products, technologies or services may compete with our products, technologies or services and our patents or other intellectual property rights may not be effective or sufficient to prevent them from competing. Even if we pursue and obtain issued patents in particular jurisdictions, our patent claims or other intellectual property rights may not be effective or sufficient to prevent third parties from so competing. 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.

Many companies have encountered significant problems in protecting and defending intellectual property rights in foreign jurisdictions. The legal systems of certain countries, particularly certain developing countries, do not favor the enforcement of patents and other intellectual property protection, particularly those relating to biotechnology, which could make it difficult for us to stop the infringement of our patents or marketing of competing products, technologies or services in violation of our proprietary rights generally. 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, could put our patents at risk of being invalidated or interpreted narrowly and our patent applications at risk of not issuing, and could provoke third parties to assert claims against us. We may not prevail in any lawsuits that we initiate and the damages or other remedies awarded, if any, may not be commercially meaningful.

Accordingly, our efforts to enforce our intellectual property rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property that we develop or license and may adversely impact our business.

In addition, we and our partners also face the risk that our products or components thereof are imported, reimported, or exported into markets with relatively higher prices from markets with relatively lower prices, which would result in a decrease of sales and any payments we receive from the affected market. Recent developments in U.S. patent law have made it more difficult to stop these and related practices based on theories of patent infringement.

Changes in patent laws or patent jurisprudence could diminish the value of patents in general, thereby impairing our ability to protect our products or technologies.

As is the case with other life science industry companies, our success is heavily dependent on intellectual property, particularly patents. Obtaining and enforcing patents involve both technological complexity and legal complexity. Therefore, obtaining and enforcing patents is costly, time-consuming and inherently uncertain. In addition, the America Invents Act, or the AIA, became effective on March 16, 2013.

An important change introduced by the AIA is that the United States transitioned to a "first-to-file" system for deciding which party should be granted a patent when two or more patent applications are filed by different parties claiming the same invention. A third-party that files a patent application in the USPTO after that date but before us could therefore be awarded a patent claiming or disclosing an invention of ours even if we had made the invention before it was made by the third-party. This will require us to be cognizant going forward of the time from invention to filing of a patent application, but circumstances could prevent us from promptly filing patent applications on our inventions. Additionally, there can be a trade-off between obtaining an earlier filing date, and waiting to obtain additional data and/or further refine a patent application. In some circumstances, the effects of a decision to pursue an earlier filing or a later filing will not be known until prior art or third-party activities are subsequently discovered, such as by the USPTO or by a third-party seeking to challenge patent rights. These circumstances may apply, for example, to patent applications prepared and filed around the time of the implementation of the AIA, or with a priority application that preceded the implementation of the AIA.

Among some of the other changes introduced by the AIA are changes that limit where a patent holder may file a patent infringement suit and providing additional opportunities for third parties to challenge an issued patent in the USPTO. This applies to all of our owned and in-licensed U.S. patents, even those issued before March 16, 2013. Because of a lower standard for evidence in USPTO proceedings compared to the standard for evidence in U.S. federal courts necessary to invalidate a patent claim, a third-party could potentially provide evidence in a USPTO proceeding sufficient for the USPTO to hold a claim invalid even though the same evidence would be insufficient to invalidate the claim if first presented in a court action. Accordingly, a third-party may try to use the USPTO procedures to invalidate our patent claims that would not have been invalidated if first challenged by the third-party in court. The AIA and its implementation could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents. In addition, the contours of the laws under the AIA are subject to further judicial interpretation and/or legislative changes.

Additionally, the U.S. Supreme Court has ruled on several patent cases in recent years, such as Impression Products, Inc. v. Lexmark International, Inc., Association for Molecular Pathology v. Myriad Genetics, Inc., Mayo Collaborative Services v. Prometheus Laboratories, Inc. and Alice Corporation Pty. Ltd. v. CLS Bank International, either narrowing the scope of patent protection available in certain circumstances or weakening the rights of patent owners in certain situations. In addition to increasing uncertainty with our ability to obtain patents in the future, this combination of events has created uncertainty as to the value of patents, once obtained, including patents in the molecular biology analysis and diagnostic space in particular. Depending on decisions by the U.S. Congress, the federal courts, and the USPTO, the laws and regulations governing patents could change in unpredictable ways that could weaken our ability to obtain new patents or to enforce our existing patents and patents that we might obtain in the future.

Obtaining and maintaining our patent protection depends on compliance with various procedural, document submission, fee payment and other requirements imposed by governmental patent agencies, and our patent protection could be reduced or eliminated for non-compliance with these requirements.

The USPTO and various foreign governmental patent agencies require compliance with a number of procedural, documentary, fee payment and other provisions during the patent process. There are situations in which noncompliance can result in abandonment or lapse of a patent or patent application, resulting in partial or complete loss of patent rights in the relevant jurisdiction. In such an event, competitors might be able to enter the market earlier than would otherwise have been the case. In some cases, our licensors may be responsible for these payments, thereby decreasing our control over compliance with these requirements.

If our trademarks and trade names are not adequately protected, then we may not be able to build name recognition in our markets of interest and our business may be adversely affected.

Our registered or unregistered trademarks or trade names may be challenged, infringed, circumvented or declared generic or determined to be infringing other marks. We may not be able to protect our rights to these trademarks and trade names, which we need to build name recognition by potential partners or customers in our markets of interest. At times, competitors may adopt trade names or trademarks similar to ours, thereby impeding our ability to build brand identity and possibly leading to market confusion. In addition, there could be potential trade name or trademark infringement claims brought by owners of other registered trademarks. Over the long term, if we are unable to establish name recognition based on our trademarks and trade names, then we may not be able to compete effectively and our business may be adversely affected.

Use of third-party open source software components in our products or our future products or technologies, and failure to comply with the terms of the underlying open source software licenses could restrict our ability to sell such products or technologies.

Use and distribution of open source software may entail greater risks than use of third-party commercial software, as open source licensors generally do not provide warranties or other contractual protections regarding infringement claims or the quality of the code. Some open source licenses may contain requirements that we make available source code for modifications or derivative works we create based upon the type of open source software we use. If we combine our proprietary software with open source software in a certain manner, we could, under certain open source licenses, be required to release the source code of our proprietary software to the public. This would allow our competitors to create similar products with less development effort and time, and ultimately could result in a loss of product sales.

Although we intend to monitor any use of open source software to avoid subjecting our products to conditions, we do not intend, the terms of many open source licenses have not been interpreted by U.S. courts, and there is a risk that any such licenses could be construed in a way that could impose unanticipated conditions or restrictions on our ability to commercialize our products. Moreover, we cannot assure investors that our processes for controlling our use of open source software in our products will be effective. If we are held to have breached the terms of an open source software license, we could be required to seek licenses from third parties to continue offering our products on terms that are not economically feasible, to re-engineer our products, to discontinue the sale of our products if re-engineering could not be accomplished on a timely basis, or to make generally available, in source code form, our proprietary code, any of which could adversely affect our business, operating results, and financial condition.

We use third-party software that may be difficult to replace or cause errors or failures of our products that could lead to lost customers or harm to our reputation.

We use software licensed from third parties in our products. In the future, this software may not be available to us on commercially reasonable terms, or at all. Any loss of the right to use any of this software could result in delays in the production of our products until equivalent technology is either developed by us, or, if available, is identified, obtained and integrated, which could harm our business. In addition, any errors or defects in third-party software or other third-party software failures could result in errors or defects or cause our products to fail, which could harm our business and be costly to correct. Many of these providers attempt to impose limitations on their liability for such errors, defects or failures, and, if enforceable, we may have additional liability to our customers or third-party providers that could harm our reputation and increase our operating costs.

We intend to maintain our relationships with third-party software providers and to seek software from such providers that does not contain any errors or defects. Any failure to do so could adversely impact our ability to deliver reliable products to our customers and could harm our results of operations.

Numerous factors may limit any potential competitive advantage provided by our intellectual property rights.

The degree of future protection afforded by our intellectual property rights is uncertain because intellectual property rights have limitations, and may not adequately protect our business, provide a barrier to entry against our competitors or potential competitors, or permit us to maintain our competitive advantage. Moreover, if a third party has intellectual property rights that cover or impact our use of our technologies, we may not be able to fully use or extract value from our intellectual property rights. For example:

- others may be able to develop and/or use technologies that are similar to our technologies or aspects of our technologies but that does not cover the claims of any our patents or patents that may issue from our patent applications or those we license;
- we or the licensor of our licensed-in patents might not have been the first to make the inventions disclosed and/or claimed in a pending patent application that we own or license;
- we or the licensor of our licensed-in patents might not have been the first to file patent applications disclosing and/or claiming an invention;
- others may independently develop similar or alternative technologies without infringing our or our licensors' intellectual property rights;
- pending patent applications that we own or license may not lead to issued patents or may not result in the claims that we want (for example, as to the scope of issued claims, if any);
- patents, if issued, that we own or license may not provide us with any competitive advantages, or may be held invalid or unenforceable, as a result of legal challenges by our competitors or other third parties;
- third parties may compete with us in jurisdictions where we do not pursue and obtain patent protection;

- we may not be able to obtain and/or maintain necessary or useful licenses on reasonable terms or at all;
- third parties may assert an ownership interest in our intellectual property and, if successful, such disputes may preclude us from exercising exclusive rights over that intellectual property;
- we may not be able to maintain the confidentiality of our trade secrets or other proprietary information;
- we may not develop or in-license additional proprietary technologies that are patentable; and
- the patents or other intellectual property of others may have an adverse effect on our business.

Should any of these events occur, they could significantly harm our business and results of operations.

Risks related to ownership of our securities

The price of our securities has been and may in the future be volatile or may decline regardless of our operating performance, and you could lose all or part of your investment.

Our stock price has been and may continue to be volatile. The daily closing market price for our common stock has varied significantly in the last 12 months, ranging between a high price of $5.89 on August 3, 2023 and a low price of $0.55 on July 5, 2024 and July 8, 2024 (as adjusted for the reverse stock split effectuated on August 3, 2023). During this time, the price per share of common stock has ranged from an intra-day low of $0.52 per share to an intra-day high of $6.00 per share (as adjusted for the reverse stock split effectuated on August 3, 2023).

The trading price of our common stock is likely to be highly volatile and could be subject to wide fluctuations in response to various factors, some of which are beyond our control, including limited trading volume. We cannot predict the actions of market participants and, therefore, can offer no assurances that the market for our common stock will be stable or appreciate over time. The market price of our common stock may be influenced by many factors, including but not limited to:

- our commercial progress in marketing and selling our genome analysis systems, including sales and revenue trends;
- changes in laws or regulations applicable to our systems;
- adverse developments related to our laboratory facilities;
- increased competition in the diagnostics services industry;
- changes in the structure or funding of research at academic and governmental research institutions, as well as pharmaceutical, biotechnology and contract research companies, including changes that would affect their ability to purchase our products, consumables and technologies;
- the failure to obtain and/or maintain coverage and adequate reimbursement for our Bionano Laboratories products and diagnostic assays and patients' willingness to pay out-of-pocket in the absence of such coverage and adequate reimbursement;
- the failure of our customers to obtain and/or maintain coverage and adequate reimbursement for their services using our OGM systems, Ionic Purification systems or our VIA software;
- adverse developments concerning our manufacturers and suppliers;
- our inability to establish future collaborations;
- additions or departures of key scientific or management personnel;
- introduction of new testing services offered by us or our competitors;
- announcements of significant acquisitions, dispositions, strategic partnerships, joint ventures or capital commitments by us or our competitors;
- our ability to effectively manage our growth;
- the size and growth, if any, of our targeted markets;
- the failure or discontinuation of any of our product development and research programs;
- actual or anticipated variations in quarterly operating results;
- our cash position;
- our failure to meet the estimates and projections of the investment community and securities analysts or that we may otherwise provide to the public;

- publication of research reports about us or our industries or positive or negative recommendations or withdrawal of research coverage by securities analysts;
- changes in the market valuations of similar companies;
- overall performance of the equity markets;
- issuances of debt or equity securities;
- sales of our securities by us or our stockholders in the future;
- trading volume of our securities;
- changes in accounting practices;
- ineffectiveness of our internal controls;
- data breaches of our company, providers, vendors or customers;
- regulatory or legal developments in the United States and other countries;
- disputes or other developments relating to proprietary rights, including our ability to adequately protect our proprietary rights in our technologies;
- significant lawsuits, including patent or stockholder litigation;
- natural disasters, infectious diseases, conflict, including the ongoing military conflict between Russia and Ukraine and the related sanctions, conflicts in the middle east, civil unrest, epidemics or pandemics, outbreaks, resurgences or major catastrophic events;
- general political and economic conditions, including potential future disruptions in access to bank deposits or lending commitments due to bank failures;
- our cost savings initiatives announced in May 2023, October 2023 and March 2024; and
- other events or factors, many of which are beyond our control.

As a result, you may not be able to sell your shares of our common stock at or above the price at which you purchased them. In addition, the stock market in general, and the market for life science technology companies in particular (including companies in the diagnostic, genomic and biotechnology related sectors), have experienced extreme price and volume fluctuations that have often been unrelated or disproportionate to the operating performance of these companies. Broad market and industry factors may negatively affect the market price of our securities, regardless of our actual operating performance. In the past, securities class action litigation has often been instituted against companies following periods of volatility in the market price of a company's securities. Because of the volatility of our stock price, we may become the target of securities litigation in the future. This type of litigation, if instituted, could result in substantial costs and a diversion of management's attention and resources, which would harm our business, operating results or financial condition.

The reverse stock split we implemented may not achieve the intended results and the market price of our common stock may be materially and negatively impacted.

At our 2023 Annual Meeting of Stockholders, our stockholders approved a proposal for a series of alternate amendments to our Amended and Restated Certificate of Incorporation, as amended, to effect, at the option of our board of directors, a reverse stock split of our common stock at a ratio between 1-for-5 and 1-for-10, inclusive, as determined by our board of directors in its sole discretion. On August 2, 2023, our board of directors approved a reverse stock split at a ratio of 1-for-10, and on August 4, 2023, we filed a certificate of amendment to effect the reverse split ratio chosen by our board of directors. We cannot assure you that we will achieve any of the intended results of the reverse stock split, including improved marketability and liquidity of our common stock, maintaining compliance with Nasdaq listing standards and encouraging trading in our common stock by long-term investors. Accordingly, the market price and the value of your investment could be materially and negatively impacted.

The effective increase in the number of shares of our common stock available for issuance as a result of the reverse stock split could result in further dilution to our existing stockholders and have antitakeover implications.

The total number of authorized shares of our common stock was not proportionately reduced in connection with our reverse stock split. As a result, the reverse stock split increased the number of shares of our common stock (or securities convertible or exchangeable for our common stock) available for issuance by decreasing the number of shares of our common stock issued and outstanding. The additional available shares are available for issuance from time to time at the discretion of our board of directors when opportunities arise, without further stockholder action, except as may be required for a particular transaction by law, the rules of any exchange on which our securities may then be listed, or other agreements or restrictions. Any issuance of

additional shares of our common stock would increase the number of outstanding shares of our common stock and (unless such issuance was pro-rata among all existing stockholders) the percentage ownership of existing stockholders would be diluted accordingly. In addition, any such issuance of additional shares of our common stock could have the effect of diluting the earnings per share and book value per share of outstanding shares of our common stock.

Additionally, such effective increase in the number of shares of our common stock available for issuance could, under certain circumstances, have anti-takeover implications. For example, without further stockholder approval, our board of directors could adopt a "poison pill" which would, under certain circumstances related to an acquisition of our securities that is not approved by the board of directors, give certain holders the right to acquire additional shares of our common stock at a low price. Our board of directors also could strategically sell shares of common stock in a private transaction to purchasers who would oppose a takeover or favor the current board of directors. Although the reverse stock split was prompted by business and financial considerations, you should be aware the reverse stock split could facilitate future efforts by us to deter or prevent changes in control, including transactions in which you might otherwise receive a premium for your shares over then current market prices.

If we are not able to comply with the applicable continued listing requirements or standards of The Nasdaq Capital Market, Nasdaq could delist our common stock.

Our ability to publicly or privately sell equity securities and the liquidity of our common stock could be adversely affected if we are delisted from The Nasdaq Capital Market ("Nasdaq") or if we are unable to transfer our listing to another stock market. In order to maintain this listing, we must satisfy minimum financial and other continued listing requirements and standards, including a requirement to maintain a minimum bid price of our common stock of $1.00 per share pursuant to Nasdaq Listing Rule 5550(a)(2) (the "Minimum Bid Price Requirement").

On multiple occasions in the past, we have failed to comply with the per share minimum required for continued listing on Nasdaq. For example, on May 30, 2023. we received a letter (the "First Notice") from Nasdaq advising us that for 30 consecutive trading days preceding the date of the First Notice, the bid price of our common stock had closed below the Minimum Bid Price Requirement.

While we implemented a reverse stock split, effective August 4, 2023 that temporarily enabled us to satisfy the Minimum Bid Price Requirement, on July 11, 2024, we received another letter (the "Second Notice") from Nasdaq advising us that for 30 consecutive trading days preceding the date of the Second Notice, the bid price of our common stock had closed below the Minimum Bid Price Requirement. The Second Notice has no effect on the listing of our common stock at this time, and our common stock continues to trade on Nasdaq under the symbol "BNGO."

Under Nasdaq Listing Rule 5810(c)(3)(A), we have 180 calendar days following the date of the Notice to regain compliance with the Minimum Bid Price Requirement. If at any time during this 180-day period the closing bid price of our common stock was at least $1.00 for a minimum of 10 consecutive business days, we would regain compliance with the Minimum Bid Price Requirement and the matter will be closed.

If we do not regain compliance with the Minimum Bid Price Requirement within the applicable compliance period, our common stock will be subject to delisting. In addition, if we fail to satisfy another Nasdaq requirement for continued listing, Nasdaq staff could provide notice that our common stock may become subject to delisting.

Even if we undertake efforts to implement another reverse stock split to attempt to regain compliance with the Minimum Bid Price Requirement we cannot assure you that such a reverse stock split will allow us to successfully regain compliance with the Minimum Bid Price Requirement, or that such an event leading to notice from Nasdaq staff will not happen again and, if it does, that we will be able to regain compliance. Accordingly, there can be no guarantee that we will be able to maintain our Nasdaq listing. If our common stock is delisted by Nasdaq, it could lead to a number of negative implications, including an adverse effect on the price of our common stock, increased volatility in our common stock, reduced liquidity in our common stock, the loss of federal preemption of state securities laws and greater difficulty in obtaining financing. In addition, delisting of our common stock could deter broker-dealers from making a market in or otherwise seeking or generating interest in our common stock, could result in a loss of current or future coverage by certain sell-side analysts and might deter certain institutions and persons from investing in our securities at all. Moreover, any such delisting could trigger a default or event of default under certain agreements that we have in place with third parties. Delisting could also cause a loss of confidence of our customers, collaborators, vendors, suppliers and employees, which could harm our business and future prospects.

If we fail to maintain effective internal control over financial reporting, we may not be able to accurately report our financial results or file our periodic reports in a timely manner, which may cause adverse effects on our business and may cause investors to lose confidence in our reported financial information and may lead to a decline in our stock price.

We are subject to the reporting requirements of the Exchange Act, the Sarbanes-Oxley Act of 2002 (the "Sarbanes-Oxley Act") and the rules and regulations of Nasdaq. The Sarbanes-Oxley Act requires, among other things, that we maintain effective disclosure controls and procedures and internal controls over financial reporting. Internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial

statements in accordance with accounting principles generally accepted in the United States. Effective internal control over financial reporting is necessary for us to provide reliable financial reports in a timely manner. The rules governing the standards that must be met for our management to assess our internal control over financial reporting are complex and require significant documentation, testing and possible remediation.

We cannot assure you that we will not experience future material weaknesses or that we will be able to successfully remediate any such material weakness in a timely manner or at all. If our independent registered public accounting firm is subsequently unable to conclude that our internal control over financial reporting is effective, we could lose investor confidence in the accuracy and completeness of our financial reports, the market price of our securities could decline, and we could be subject to sanctions or investigations by Nasdaq, the SEC or other regulatory authorities and we could be subject to shareholder litigation. Failure to remedy any material weakness in our internal control over financial reporting, or to implement or maintain other effective control systems required of public companies, could also restrict our future access to the capital markets.

Further, as a "non-accelerated filer" we are not required to obtain an independent assessment of the effectiveness of our internal controls. An independent assessment of the effectiveness of our internal controls could detect problems that our management's assessment might not. Consequently, if we choose not to obtain an independent assessment, there is a risk that we may not detect problems with our internal controls that otherwise might have been detected.

These inherent limitations include the realities that judgments in decision-making can be faulty, and that breakdowns can occur because of simple errors or mistakes. Additionally, controls can be circumvented by the individual acts of some persons, by collusion of two or more people or by an unauthorized override of the controls. Accordingly, because of the inherent limitations in our control system, misstatements due to error or fraud may occur and not be detected.

We are a smaller reporting company, and the reduced reporting requirements applicable to smaller reporting companies could make our securities less attractive to investors.

We currently qualify as a smaller reporting company and a non-accelerated filer, which allows us to take advantage of many exemptions from various reporting requirements that are applicable to other public companies that are not smaller reporting companies, including not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act and reduced disclosure obligations regarding executive compensation in our periodic reports and proxy statements. As we have chosen to avail ourselves of certain scaled disclosure requirements applicable to smaller reporting companies, the content of our disclosures may differ from period to period. We may no longer qualify as a smaller reporting company in the future should the market value of our common stock held by non-affiliates as of the end of the second quarter of any given year once again exceed $700.0 million or our revenue as for any fiscal year exceeds $100.0 million. There may be further variance in the content of our disclosures as we avail ourselves of certain scaled disclosure requirements if we subsequently no longer qualify as a smaller reporting company because we would be required to provide the full disclosures required of non-smaller reporting companies. We cannot predict if investors will find our securities less attractive because we rely on these exemptions, which could result in a less active trading market for our securities and increased volatility in the price of our securities.

A significant portion of our total outstanding shares are restricted from immediate resale but may be sold into the market in the near future. This could cause the market price of our common stock to drop significantly, even if our business is doing well.

Sales of a substantial number of shares of our common stock in the public market could occur at any time, subject to the restrictions and limitations described below. If our stockholders sell, or the market perceives that our stockholders intend to sell, substantial amounts of our common stock in the public market, the market price of our common stock could decline significantly. All of our outstanding shares of common stock are available for sale in the public market, subject only to the restrictions of Rule 144 under the Securities Act in the case of our affiliates.
In addition, as of the date of this Quarterly Report, we have filed registration statements on Form S-8 under the Securities Act registering the issuance of an aggregate of 7.6 million shares of common stock subject to options or other equity awards issued or reserved for future issuance under our equity incentive plans. We also intend to file future registration statements on Form S-8 under the Securities Act registering the issuance of additional shares of common stock, including because the number of shares that may be issued under certain employee equity benefit plans automatically increase as a result of the operation of certain "evergreen" provisions in our equity plans. Shares registered under these registration statements on Form S-8 are available for sale in the public market subject to vesting arrangements and exercise of options, and the restrictions of Rule 144 in the case of our affiliates. Further in connection with the Private Placement completed in October 2023, we filed a Form S-3 to enable the purchasers to resell the shares underlying the Private Placement Notes and the Private Placement Warrants (as defined in Note 5 (Debt) to our unaudited condensed consolidated financial statements). Following the redemptions in February and May 2024, the High Trail Private Placement Notes and the High Trail Registered Notes have been canceled. However, the purchaser retains the Private Placement Warrants to purchase up to 6.8 million shares of our common stock. Further, in connection with the April 2024 Registered Direct Offering, we issued and sold, among other things, warrants to purchase approximately 8.7 million shares of our common stock; and in connection with the July 2024 Registered Direct Offering, we

issued and sold, among other things, warrants to purchase approximately 35.0 million shares of our common stock following stockholder approval.

Anti-takeover provisions under our charter documents and Delaware law could delay or prevent a change of control which could limit the market price of our securities and may prevent or frustrate attempts by our security holders to replace or remove our current management.

Our amended and restated certificate of incorporation and amended and restated bylaws, contain provisions that could delay or prevent a change of control of our company or changes in our board of directors that our stockholders might consider favorable. Some of these provisions include:

- a board of directors divided into three classes serving staggered three-year terms, such that not all members of the board will be elected at one time;
- a prohibition on stockholder action through written consent, which requires that all stockholder actions be taken at a meeting of our stockholders;
- a requirement that special meetings of stockholders be called only by the chairman of the board of directors, the chief executive officer, the president or by a majority of the total number of authorized directors;
- advance notice requirements for stockholder proposals and nominations for election to our board of directors;
- a requirement that no member of our board of directors may be removed from office by our stockholders except for cause and, in addition to any other vote required by law, upon the approval of not less than two-thirds of all outstanding shares of our voting stock then entitled to vote in the election of directors;
- a requirement of approval of not less than two-thirds of all outstanding shares of our voting stock to amend any bylaws by stockholder action or to amend specific provisions of our certificate of incorporation; and
- the authority of the board of directors to issue preferred stock on terms determined by the board of directors without stockholder approval and which preferred stock may include rights superior to the rights of the holders of common stock.

In addition, because we are incorporated in Delaware, we are governed by the provisions of Section 203 of the General Corporation Law of the State of Delaware, which may prohibit certain business combinations with stockholders owning 15% or more of our outstanding voting stock. These anti-takeover provisions and other provisions in our amended and restated certificate of incorporation and amended and restated bylaws could make it more difficult for stockholders or potential acquirers to obtain control of our board of directors or initiate actions that are opposed by the then-current board of directors and could also delay or impede a merger, tender offer or proxy contest involving our company. These provisions could also discourage proxy contests and make it more difficult for you and other stockholders to elect directors of your choosing or cause us to take other corporate actions you desire. Any delay or prevention of a change of control transaction or changes in our board of directors could cause the market price of our securities to decline.

Our amended and restated certificate of incorporation provides that the Court of Chancery of the State of Delaware and the federal district courts of the United States of America will be the exclusive forums for substantially all disputes between us and 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 amended and restated certificate of incorporation provides that the Court of Chancery of the State of Delaware is the exclusive forum for the following types of actions or proceedings under Delaware statutory or common law:

- any derivative action or proceeding brought on our behalf;
- any action asserting a breach of fiduciary duty;
- any action asserting a claim against us arising under the Delaware General Corporation Law, our amended and restated certificate of incorporation, or our amended and restated bylaws; and
- any action asserting a claim against us that is governed by the internal-affairs doctrine.

This provision would not apply to suits brought to enforce a duty or liability created by the Exchange Act. Furthermore, Section-22 of the Securities Act creates concurrent jurisdiction for federal and state courts over all such Securities Act actions. Accordingly, both state and federal courts have jurisdiction to entertain such claims. To prevent having to litigate claims in multiple jurisdictions and the threat of inconsistent or contrary rulings by different courts, among other considerations, our amended and restated certificate of incorporation further provides that the federal district courts of the United States of America will be the exclusive forum for resolving any complaint asserting a cause of action arising under the Securities Act. While the Delaware courts have determined that such choice of forum provisions are facially valid, a stockholder may nevertheless seek to

bring a claim in a venue other than those designated in the exclusive forum provisions. In such instance, we would expect to vigorously assert the validity and enforceability of the exclusive forum provisions of our amended and restated certificate of incorporation. This may require significant additional costs associated with resolving such action in other jurisdictions and there can be no assurance that the provisions will be enforced by a court in those other jurisdictions.

These exclusive forum provisions 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 lawsuits against us and our directors, officers and other employees. If a court were to find either exclusive-forum provision contained in our amended and restated certificate of incorporation to be inapplicable or unenforceable in an action, we may incur further significant additional costs associated with resolving the dispute in other jurisdictions, all of which could adversely affect our results of operations and financial condition.

An active trading market for our common stock may not be sustained.

Although our common stock is listed on The Nasdaq Capital Market, there is a risk that an active trading market for our shares may not be sustained, which could put downward pressure on the market price of our common stock and thereby affect the ability of our stockholders to sell their shares. Any inactive trading market for our common stock may also impair our ability to raise capital to continue to fund our operations by selling shares and may impair our ability to acquire other companies or technologies by using our shares as consideration.

General Risk Factors

If securities or industry analysts do not publish research or publish inaccurate or unfavorable research about our business, the price of our securities and trading volume could decline.

The trading market for our securities will depend in part on the research and reports that securities or industry analysts publish about us or our business. We have only limited research coverage on our company by equity research analysts. If securities or industry analysts elect not to initiate or continue to provide coverage of our company, the trading price for our securities would likely be negatively impacted. If one or more of the analysts who covers us downgrades our securities or publishes inaccurate or unfavorable research about our business, the price of our securities may decline. If one or more of these analysts ceases coverage of our company or fails to publish reports on us regularly, demand for our securities could decrease, which might cause the price of our securities and trading volume to decline.

Our business could be negatively affected as a result of actions of activist stockholders, and such activism could impact the trading value of our securities.

Stockholders may, from time to time, engage in proxy solicitations or advance stockholder proposals, or otherwise attempt to effect changes and assert influence on our board of directors and management. Activist campaigns that contest or conflict with our strategic direction or seek changes in the composition of our board of directors could have an adverse effect on our operating results and financial condition. A proxy contest would require us to incur significant legal and advisory fees, proxy solicitation expenses and administrative and associated costs and require significant time and attention by our board of directors and management, diverting their attention from the pursuit of our business strategy. Any perceived uncertainties as to our future direction and control, our ability to execute on our strategy, or changes to the composition of our board of directors or senior management team arising from a proxy contest could lead to the perception of a change in the direction of our business or instability which may result in the loss of potential business opportunities, make it more difficult to pursue our strategic initiatives, or limit our ability to attract and retain qualified personnel and business partners, any of which could adversely affect our business and operating results. If individuals are ultimately elected to our board of directors with a specific agenda, it may adversely affect our ability to effectively implement our business strategy and create additional value for our stockholders. We may choose to initiate, or may become subject to, litigation as a result of the proxy contest or matters arising from the proxy contest, which would serve as a further distraction to our board of directors and management and would require us to incur significant additional costs. In addition, actions such as those described above could cause significant fluctuations in our stock price based upon temporary or speculative market perceptions or other factors that do not necessarily reflect the underlying fundamentals and prospects of our business.

Securities class action litigation could divert our management's attention and harm our business and could subject us to significant liabilities.

The stock markets have from time to time experienced significant price and volume fluctuations that have affected the market prices for the equity securities of life sciences and biotechnology companies. These broad market fluctuations may cause the market price of our ordinary shares to decline. In the past, securities class action litigation has often been brought against a company following a decline in the market price of its securities. This risk is especially relevant for us because biotechnology and biopharma companies have experienced significant stock price volatility in recent years. Even if we are successful in defending claims that may be brought in the future, such litigation could result in substantial costs and may be a distraction to our management and may lead to an unfavorable outcome that could adversely impact our financial condition and prospects.

ITEM 2. UNREGISTERED SALES OF EQUITY SECURITIES AND USE OF PROCEEDS

All unregistered sales of equity securities during the quarter ended June 30, 2024 have been previously reported.

ITEM 3. DEFAULTS UPON SENIOR SECURITIES

None.

ITEM 4. MINE SAFETY DISCLOSURES

None.

ITEM 5. OTHER INFORMATION

During the three months ended June 30, 2024, no director or officer of the Company adopted, terminated or modified a “Rule 10b5-1 trading arrangement” or “non-Rule 10b5-1 trading arrangement,” as defined in Item 408(a) of Regulation S-K of the Exchange Act.

ITEM 6. EXHIBITS

Exhibit Number	Description
3.1	Amended and Restated Certificate of Incorporation, as amended (incorporated by reference to Exhibit 3.1 to Registrant's Quarterly Report on Form 10-Q, filed with the SEC on November 8, 2023.
3.2	Amended and Restated Bylaws (incorporated by reference to Exhibit 3.2 to the Registrant's Current Report on Form 8-K, filed with the SEC on August 24, 2018).
3.3	Amendment to Amended and Restated Bylaws (incorporated by reference to Exhibit 3.2 to the Registrant's Current Report on Form 8-K, filed with the SEC on April 14, 2023).
4.1	Form of Common Stock Certificate (incorporated by reference to Exhibit 4.1 to the Registrant's Registration Statement on Form S-1 (File No. 333-225970), as amended, originally filed with the SEC on June 28, 2018).
4.2	Form of Warrant to Purchase Series D-1 Preferred Stock issued to Midcap Financial Trust (incorporated by reference to Exhibit 4.8 to the Registrant's Registration Statement on Form S-1 (File No. 333-225970), as amended, originally filed with the SEC on June 28, 2018).
4.3	Form of Warrant to Purchase Common Stock Issued to Underwriters (attached to the Underwriting Agreement) (incorporated by reference to Exhibit 4.9 to the Registrant's Registration Statement on Form S-1 (File No. 333-225970), as amended, originally filed with the SEC on June 28, 2018).
4.4	Form of Warrant Certificate (attached to the Warrant Agent Agreement) (incorporated by reference to Exhibit 4.10 to the Registrant's Registration Statement on Form S-1 (File No. 333-225970), as amended, originally filed with the SEC on June 28, 2018).
4.5	Form of Warrant Agent Agreement by and between the Registrant and American Stock Transfer & Trust Company LLC, as warrant agent (incorporated by reference to Exhibit 4.11 to the Registrant's Registration Statement on Form S-1 (File No. 333-225970), as amended, originally filed with the SEC on June 28, 2018).
4.6	Form of Warrant to Purchase Common Stock for Service Providers (incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K, filed with the SEC on November 21, 2018).
4.7	Form of Warrant to Purchase Common Stock issued to Investors in October 2019 Public Offering (incorporated by reference to Exhibit 4.13 to the Registrant's Registration Statement on Form S-1 (File No. 333-233828), as amended, originally filed with the SEC on September 18, 2019).
4.8	Form of Warrant to Purchase Common Stock issued to Investors in April 2020 Public Offering) (incorporated by reference to Exhibit 4.16 to the Registrant's Registration Statement on Form S-1 (File No. 333-237074), as amended, originally filed with the SEC on March 11, 2020).
4.9	Form of Note, representing the Company's Senior Secured Convertible Notes due 2025 (incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K, filed with the SEC on October 11, 2023).
4.10	Amendment to Initial Registered Note issued to Purchaser dated February 27, 2024 (incorporated by reference to Exhibit 10.2 to the Registrant's Current Report on Form 8-K, filed with the SEC on February 28, 2024).
4.11	Form of Warrant to Purchase Common Stock issued to Purchaser in October 2023 Offering (incorporated by reference to Exhibit 4.2 to the Registrant's Current Report on Form 8-K, filed with the SEC on October 11, 2023).
4.12	Form of Warrant to Purchase Common Stock issued to Investors in April 2024 Registered Direct Offering) (incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K, filed with the SEC on April 5, 2024).
4.13	Form of Warrant to Purchase Common Stock issued to Investors in April 2024 Registered Direct Offering) (incorporated by reference to Exhibit 4.2 to the Registrant's Current Report on Form 8-K, filed with the SEC on April 5, 2024).
4.14^#	Form of Senior Secured Convertible Debenture Due May 24, 2026 (incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K, filed with the SEC on May 28, 2024)
10.1^+	Securities purchase agreement dated as of April 4, 2024 (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K, filed with the SEC on April 5, 2024).
10.2^	Letter Agreement between the Company and the Purchaser named therein, dated February 27, 2024 (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K, filed with the SEC on February 28, 2024).
10.3^#	Securities Purchase Agreement, dated May 24, 2024, by and among the Company and the Buyers named therein (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K, filed with the SEC on May 28, 2024)
10.4^#	Security Agreement, dated as of May 24, 2024, by and among the Company, BioDiscovery, LLC, Lineagen, Inc., Purigen Biosystems, Inc., and JGB Collateral LLC (incorporated by reference to Exhibit 10.2 to the Registrant's Current Report on Form 8-K, filed with the SEC on May 28, 2024)
10.5	Subsidiary Guaranty, dated as of May 24, 2024, by BioDiscovery LLC, Lineagen, Inc., Purigen Biosystems, Inc. in favor the Investors (incorporated by reference to Exhibit 10.3 to the Registrant's Current Report on Form 8-K, filed with the SEC on May 28, 2024)

10.6	Registration Rights Agreement, dated May 24, 2024, by and between the Company and the Investors (incorporated by reference to Exhibit 10.5 to the Registrant's Current Report on Form 8-K, filed with the SEC on May 28, 2024)
10.7	Letter Agreement Re: Agreement to Redeem Senior Secured Convertible Notes due 2025, dated May 23, 2024, by and between the Company and High Trail Special Situations LLC (incorporated by reference to Exhibit 10.6 to the Registrant's Current Report on Form 8-K, filed with the SEC on May 28, 2024)
10.8^+	Master Services Agreement by and between the Registrant and Skorpios Technologies, Inc. (f/k/a Novati Technologies, Inc. and f/k/a SVTC Technologies, LLC), dated March 2, 2009, as amended.
10.9^+	Manufacturing Services Agreement by and between the Registrant and Paramit Corporation, dated February 18, 2015
10.10^+	License Agreement by and between Princeton University and the Registrant, dated January 7, 2004.
10.11+	First Amendment to the License Agreement by and between Princeton University and the Registrant, dated December 17, 2004.
10.12+	Second Amendment to the License Agreement by and between Princeton University and the Registrant, dated February 25, 2010.
10.13+	Fourth Amendment to the License Agreement by and between Princeton University and the Registrant, dated February 9, 2012.
10.14^+	License Agreement by and between the Registrant and Q Biotechnology CV dated May 1, 2014.
10.15+	Amendment to Non-Exclusive Patent License Agreement by and between the Registrant and Q Biotechnology CV dated May 1, 2014.
10.16^+	License Agreement by and between the Registrant and New York University dated November 4, 2013.
10.17^+	Option and Sublicense Agreement by and between the Registrant and Pacific Biosciences of California, Inc. dated February 2, 2016.
31.1	Certification of Principal Executive Officer pursuant to Rules 13a-14(a) and 15d-14(a) promulgated under the Securities Exchange Act of 1934, as amended.
31.2	Certification of Principal Financial Officer pursuant to Rules 13a-14(a) and 15d-14(a) promulgated under the Securities Exchange Act of 1934, as amended.
32.1*	Certification of Principal Executive Officer and Principal Financial Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
101.INS	Inline XBRL Instance Document—the instance document does not appear in the Interactive Data File as its XBRL tags are embedded within the Inline XBRL document.
101.SCH	Inline XBRL Taxonomy Extension Schema Document.
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document.
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document.
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase Document.
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Document.
104	Cover Page Interactive Data File (formatted in Inline XBRL and contained in Exhibit 101)

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* This certification is deemed not filed for purpose of section 18 of the Exchange Act or otherwise subject to the liability of that section, nor shall it be deemed incorporated by reference into any filing under the Securities Act or the Exchange Act.

^ Certain schedules to this agreement have been omitted pursuant to Item 601(a)(5) of Regulation S-K. The Company agrees to furnish a copy of all omitted schedules to the SEC upon its request.

\+ Pursuant to Item 601(b)(10)(iv) of Regulation S-K, certain portions of this exhibit have been redacted because they are both not material and is the type that the Registrant treats as private or confidential. The Registrant hereby agrees to furnish supplementally to the SEC, upon its request, an unredacted copy of this exhibit.

\# Portions of this exhibit have been omitted pursuant to Item 601(b)(2)(ii) of Regulation S-K. The Company agrees to furnish supplementally an unredacted copy of the Exhibits to the SEC upon its request.

SIGNATURES

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

BIONANO GENOMICS, INC.

Dated: August 7, 2024

By: /s/ R. Erik Holmlin, Ph.D.
R. Erik Holmlin, Ph.D.
President and Chief Executive Officer
(Principal Executive Officer)

Dated: August 7, 2024

By: /s/ Gülsen Kama
Gülsen Kama
Chief Financial Officer
(Principal Financial and Accounting Officer)

Exhibit 10.8

CERTAIN INFORMATION CONTAINED IN THIS EXHIBIT, MARKED BY [***], HAS BEEN EXCLUDED FROM THIS EXHIBIT BECAUSE THE REGISTRANT HAS DETERMINED THAT IT IS BOTH NOT MATERIAL AND IS THE TYPE THAT THE REGISTRANT TREATS AS PRIVATE OR CONFIDENTIAL.MASTER SERVICES AGREEMENT

MASTER SERVICES AGREEMENT

This **MASTER SERVICES AGREEMENT** (the "Agreement") is entered into effective as of March 2, 2009 ("***Effective Date***") by and between **SVTC TECHNOLOGIES**, **LLC**, a Delaware limited liability company, with principal offices at 3901 North First Street, San Jose, CA 95134, USA, ("SVTC") and BioNanomatrix, Inc., a Delaware Corporation, with principal offices located at 3701 Market St, 4th Floor, Philadelphia, Pennsylvania 19104, USA ("Customer").

RECITALS

WHEREAS, SVTC including its facilities located in San Jose, CA and Austin, TX, own and operate semiconductor manufacturing, research and development facilities, offers semiconductor-process engineering development and related services, and also licenses related intellectual property; and,

WHEREAS, Customer desires to engage SVTC to provide certain of the above services or to licenses SVTC intellectual property, NOW THEREFORE, for valuable consideration, the parties hereby agree as

follows:

1. **DEFINITIONS**

1.1 **"*Affiliate*"** shall mean any entity that controls, is controlled by or is under common control with SVTC or Customer. For purposes of this definition, "control" shall mean beneficial ownership of (i) more than fifty percent (50%) of the shares of the subject entity entitled to vote in the election of directors (or, in the case of an entity that is not a corporation, for the election of the corresponding managing authority); or (ii) such lesser percentage as is the maximum control or ownership right permitted in the country where the subject entity exists. A "Wholly Owned Affiliate" shall mean an entity that is at least eighty percent (80%) controlled by a party to this Agreement.

1.2 **"*Confidential Information*"** shall mean information that is disclosed between the parties under this Agreement conspicuously marked or confirmed in writing if oral, that the disclosure is confidential, including the disclosure of any Technology, intellectual property or other documentation or any product plans, business, financial or personnel information. "Confidential Information" shall not include information which: (i) is publicly disclosed by the receiving party with the prior written approval of the disclosing party; (ii) is independently developed by the receiving party without use of the disclosing party's Confidential Information; (iii) is intentionally disclosed by the disclosing party to a third party without restriction on disclosure; (iv) is rightfully received by the receiving party from a third party without a duty of confidentiality; or (v) is disclosed pursuant to any judicial or governmental order, provided that the receiving party gives the disclosing party sufficient prior written notice to contest such order.

1.3 **"*Customer Personnel*"** shall mean all employees, contractors, agents and any others brought onto SVTC premises by or at the behest of Customer, who are therefore subject to provisions of this Agreement.

1.4 **"*Intellectual Property Rights*"** shall mean those rights emanating from forms of intellectual property as defined by applicable laws including any or all of the following and all rights in, arising out of, or associated therewith: (i) all patent rights and all reissues, renewals, re-examinations, continuations, continuations in part, divisions and extensions thereof or foreign counterparts thereto, and all applications for any of the foregoing; (ii) all trade secrets and other rights in know-how and confidential or proprietary information; (iii) all copyrights, copyrights registrations and related applications and all other rights in or to works of authorship corresponding thereto throughout the world; (iv) all mask works, mask work registrations and applications, and any equivalent or similar rights in semiconductor masks, layouts, architectures or topology; (v) all trademarks, service marks, trade names, service names, trade dress, domain names and similar rights; and (vi) any corresponding or equivalent rights to any of the foregoing now known or hereafter recognized anywhere in the world.

1.5 "*Line*" or "*Pilot Line*" shall mean semiconductor wafer processing facilities, which also may be referred to as the "fab" or "foundry" and that are operated by SVTC.

1.6 "*Start Date*" shall mean the mutually agreed date that SVTC will begin providing services under this Agreement and the attached Schedules.

1.7 "*Schedule*" means one or more documents attached to this Agreement, spelling out the details of Customer projects and the specific terms and conditions that will apply to the provision of SVTC services for those projects; exhibits may be attached to Schedules. By way of example, A "Statement of Work" or "Scope of Work" or "SOW" may be attached.

1.8 "*SVTC Personnel*" shall mean all employees, contractors or agents of SVTC.

1.9 "*Technology*" means embodiments of Intellectual Property Rights, whether in electronic, written or other media, including technical documentation, specifications, designs, bills of material, build instructions, test reports, schematics, algorithms, user interfaces, routines, formulae, process libraries or recipe books, test vectors, IP cores, net lists, photomasks, reticles, databases, lab notebooks, processes, prototypes, samples, studies, wafers, chips, know-how, or other works of authorship.

1.10 "*Term*" means the period commencing on the Effective Date and ending on the date that this Agreement expires or is terminated.

2. SERVICES AND SUPPORT

1.1 Services. SVTC will provide Customer the services described in Schedules and other attachments to this Agreement, which are incorporated by reference. In the event of a conflict between the terms and conditions of any attachment and this Agreement, the terms and conditions of this Agreement shall govern unless explicitly superseded in such attachment.

1.2 Premises Support for Customer Personnel. Customer may request support or facilities for Customer Personnel on SVTC premises such as that provided to Resident Partner customers, as defined and described in applicable attachments. Unless agreed in writing otherwise, SVTC shall not make available for Customer, clerical, administrative or infrastructure support or any physical space on its premises.

1.3 Equipment. Except as otherwise set forth herein or in a Schedule, as between the parties, SVTC will own all equipment in the fab or elsewhere on SVTC's premises and Customer will acquire no rights or interest in or to any equipment at SVTC premises as a result of this Agreement. If it is agreed in an attachment that Customer may bring equipment into the fab or elsewhere on SVTC premises, whether to be operated by SVTC or by Customer, such equipment must be pre-approved by SVTC, is subject to being located or relocated during the term of this Agreement if required by SVTC, and must be promptly removed on the termination of this Agreement. Customer shall have no right to any particular space on the premises and the space that is assigned may expand or contract as required or as mutually agreed for specific projects pursuant to this Agreement.

1.4 Legal Status While On Premises. The legal status of Customer Personnel while on SVTC premises is that of an invitee. In the event that any individual who is an employee of Customer, or anyone else who is on the SVTC premises at the invitation of Customer, fails to comply with the safety, security, confidentiality, or other applicable conditions in this Agreement, its attachments, or in other mutually agreed documents, then SVTC may order such individuals off the premises and their continued presence will be considered that of a trespasser.

1.5 Wafer/Silicon Reclamation and Recycling. SVTC supports the reclamation and recycling of discarded wafers and scrap silicon. If applicable to Customer, it is acknowledged that if any is not removed by Customer, it will be destroyed, reclaimed, or recycled at SVTC's sole discretion.

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1.6 Hazardous Materials. No hazardous or toxic materials may be brought onto SVTC premises without SVTC's prior written consent. All materials to be used in the fab, whether or not toxic or otherwise hazardous, must be pre-approved by SVTC.

3. CUSTOMER PAYMENT ARRANGEMENTS

1.1 Fees and Costs. All information on prices, fees, and costs to be paid by Customer shall be listed in attached Schedule[s]. Unless otherwise specifically stated in the applicable Schedule, the payment terms shall be as described below in Section 3.4.

1.2 Taxes. All fees stated herein or otherwise provided by SVTC pursuant to this Agreement are exclusive of taxes. Customer shall be responsible for and shall pay any applicable sales, use, excise, withholding or similar taxes, including value added taxes (VAT) and customs duties, that may be due for the provision of services and licenses under this Agreement, or for the purchase of wafers or other deliverables hereunder, excluding any taxes based on SVTC's net income. Customer will make all payments hereunder free and clear of, and without reduction for, any withholding taxes; any such taxes imposed on payments of the fees to SVTC will be Customer's sole responsibility. Customer will provide SVTC with official receipts issued by the appropriate taxing authority, or such other evidence as SVTC may reasonably request, to establish that such taxes have been paid. No tax shall be billed to Customer if Customer provides SVTC with either (i) an exemption certificate provided in good faith and in accordance with applicable law, or (ii) a direct pay permit number provided in accordance with applicable law.

1.3 Extraordinary Expenses. To the extent that Customer intends to use raw materials that are different or more expensive than those used by SVTC, or to take any other action that it or SVTC expects (or should expect in the exercise of prudent technical and commercial judgment) will increase expenses above those in the normal course (any expense so incurred, an "Extraordinary Expense"), SVTC will invoice Customer in accordance with Section 3.4 or as otherwise specified in the applicable Schedule. Extraordinary Expenses will not be incurred without the prior written approval of Customer, and no activities that might result in such Extraordinary Expenses will be conducted by SVTC absent Customer's agreement to bear such Extraordinary Expenses.

1.4 Payment Terms.

(a) Customer will be invoiced monthly for all services and deliverables provided by SVTC during the previous month. All other payments required hereunder shall be invoiced on a monthly basis at the beginning of each calendar month and shall be paid within […***…]. Each SVTC invoice hereunder shall be accompanied by a detailed report containing supporting information, as Customer may reasonably request, used to determine the amounts due hereunder.

(b) Except as may be agreed otherwise in writing, all payments due to SVTC under this Agreement shall be made by bank wire transfer to a designated bank account. All payments shall be made in U.S. dollars unless otherwise agreed by the parties. If any payments are more than […***…] late, Customer will pay SVTC, in addition to any other remedies that may be available to SVTC, a late payment of the lower of […***…] per month or the highest rate allowed by law for all past due amounts until paid.

4. INTELLECTUAL PROPERTY RIGHTS

1.1 Joint Development. Unless otherwise expressly set forth in a Schedule attached hereto, SVTC and Customer do not plan any joint development at the time of this Agreement. Any joint development activities intended by the parties must be agreed to in writing and ownership of any resulting Technology and Intellectual Property Rights shall be as set forth therein. If Technology and Intellectual Property Rights are created or invented jointly, unless expressly agreed in writing otherwise, such Technology and Intellectual Property Rights shall be jointly owned in accordance with US intellectual property laws but without any right of accounting, except that it is agreed that any jointly created patent improvements or copyright derivatives shall be assigned to the owner of the underlying Technology.

1.2 New Technology and Related Intellectual Property Rights. Any Technology and related Intellectual Property Rights, invented, created, or authored solely or independently by either party shall be owned by that party, except that it is agreed that all rights in any patent improvements or copyright derivatives to the other party's Technology shall be assigned to the other party subject to a license back for use solely in connection with the purposes of this Agreement. The creating party agrees to promptly notify the other party and to cooperate in any government filings undertaken.

1.3 Pre-existing Technology and Ownership. Any Technology and any related Intellectual Property Rights, pre-existing this Agreement shall stay with the owning party and is no ownership rights are assigned or otherwise transferred by this Agreement, save and except for license rights granted by each party to the other necessary to perform the obligations of this Agreement or as otherwise provided in section 5, below. For purposes of clarity, SVTC agrees that the chip design, composition, layout, topology, fabrication process flow, process selection and material selection described in Exhibit D is Customer Technology and all related Intellectual Property is the property of the Customer.

1.4 Trade Secrecy. SVTC shall treat all knowledge of Customer's projects and development work pursuant to this Agreement, including by way of example process flows and recipes, whether or not subject to protection under other intellectual property laws, as Customer's trade secrets subject to the confidentiality provisions of section 10, below, and/or other agreements between the parties; SVTC agrees to scrupulously prevent other customers of SVTC or third parties from gaining knowledge of such Customer trade secrets.

1.5 Intellectual Property Prosecution. To avoid a flawed prosecution, Customer agrees that if it decides to file for a patent or to otherwise perfect ownership through any other government registration for Technology created pursuant to the performance of this Agreement that is related to or is an improvement of SVTC Technology, Customer agrees to notify SVTC before filing to confirm whether the subject matter of the intended filing has not previously become part of SVTC's intellectual property program or whether it has been previously disclosed by SVTC to other customers or is already intellectual property owned by others.

5. LICENSES

1.1 License from Customer. Customer grants no rights to SVTC except for a non-exclusive, non-transferable, royalty-free license under Customer's applicable Intellectual Property Rights, to use any of Customer's Technology, products or processes as necessary for SVTC to provide the services requested by Customer pursuant to this Agreement, for the purposes of this Agreement.

1.2 License from SVTC. Subject to the terms and conditions of this Agreement, SVTC grants Customer a non-exclusive, perpetual, irrevocable, royalty free and paid up right and license, under all applicable SVTC Intellectual Property Rights (including any Technology developed by SVTC pursuant to activities under this Agreement) (the "***Licensed Technology***") for the manufacture of Customer's products (including any unique equipment configurations and modifications used therein and any unique semiconductor or integrated circuit structures resulting from such modules). Subject to the terms and conditions set forth herein, such right and license shall include (i) the right to have Customer products made by third party manufacturers, and (ii) the right to sublicense such rights to third parties solely as a part of a license to such party for the manufacture of a Customer product.

1.3 No Other Rights. Except as expressly provided in this Section or the applicable Schedule, neither party grants to the other party any license, right, title or interest in or to any Intellectual Property Rights or Technology, whether by implication, estoppel or otherwise. All rights not specifically granted herein are reserved by the Party owning the respective Technology and Intellectual Property Rights.

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6. INDEMNIFICATION

1.1 SVTC Indemnification Obligations. SVTC shall defend, indemnify, and hold Customer harmless from and against any claim of liability, loss, damage, cost or expense (including reasonable attorneys' fees and other legal expenses) (collectively, "***Losses***") resulting from any third party claim that (i) is based upon any act or omission of SVTC or any SVTC Personnel, (ii) based upon any material breach by SVTC of any obligation imposed by this Agreement (iii) use of Customer equipment by SVTC Personnel or (iv) Licensed Technology infringes or misappropriates the Intellectual Property Rights of any third party. This indemnity shall not apply to the extent that any such claim is based upon (i) modification to the Licensed Technology made by or on behalf of Customer, (ii) Customer's use of the Licensed Technology outside of the scope of the license granted pursuant to this Agreement, or (iii) a claim that is subject to Customer's indemnification obligations pursuant to Section 7.2. SVTC's obligation under this paragraph shall expire as to any claim that Customer has not provided written notification of to SVTC within one year after receipt by Customer or becomes known by Customer.

1.2 Customer Indemnification Obligations. Customer shall defend, indemnify, and hold SVTC or any Affiliate of SVTC harmless from and against any Losses (as defined in the preceding paragraph) resulting from any third party claim (i) that any Customer Personnel is an employee of SVTC (such Losses including any employee benefit that any such person claims to be entitled to from SVTC as an employee of SVTC), (ii) based upon any act or omission of any Customer Personnel (such Losses including but not limited to any fire or other catastrophic loss to the Line or any significant portion of the Line that is attributable to any such act or omission), (iii) based upon any breach by Customer or any Customer Personnel of any obligation imposed by this Agreement, (iv) relating to Customer equipment in the event that customer equipment fails to perform as designed, (v) relating to Customer's implementation or use of Customer's Technology at the SVTC premises, including claims related to bodily injury, damage or loss of tangible property, and (vi) that Customer equipment, Customer processes or Customer Technology infringes or misappropriates the Intellectual Property Rights of any third party. Customer shall not be obligated to defend, indemnify, or hold SVTC harmless to the extent that any such claim is based upon a modification to the Customer equipment or Customer's Technology made by SVTC, if such modification was not made at the instruction or on behalf of Customer. Customer's obligation under this paragraph shall expire as to any claim that SVTC has not provided written notification of to Customer within one year after receipt by SVTC or becomes known by SVTC.

1.3 Procedure. Each party seeking indemnification under this Section 6 (i) agrees to provide the indemnifying party prompt written notice of an indemnifiable claim, (ii) agrees to provide control of the defense or settlement of such claim to the indemnifying Party, provided that the indemnifying party shall not settle or compromise a claim in a manner that does not unconditionally release the indemnified party from liability and that does not adversely affect the Intellectual Property Rights owned by the indemnified party unless the indemnifying party obtains the indemnified party's prior written consent; and (iii) agrees to provide assistance in the defense or settlement of a claim at the indemnifying Party's request and reasonable expense.

1.4 Insurance. During the term of this Agreement, each party will, for its respective liability, secure and maintain a comprehensive general liability insurance policy providing sufficient coverage for personal injury (including as a result of product liability) and property damage, at the level as is usual and customary in the industry to procure, provided, that in the event that Customer Personnel is actually working on the Line and using SVTC equipment, then such insurance shall be in accordance with Exhibit C.

7. REPRESENTATIONS AND WARRANTIES

1.1 SVTC Limited Warranties. SVTC represents and warrants that (i) SVTC has the full right and authority to enter into this Agreement and grant the rights and licenses granted herein; (ii) SVTC has not previously granted and will not grant any rights that prevent SVTC from fulfilling its obligations under this Agreement; and (iii) SVTC will comply with all applicable laws and regulations in connection with its performance under this Agreement. SVTC warrants that it will use commercially reasonable efforts to provide the services contracted for in this Agreement. Due to the research and development nature of the services to be provided, and in particular, any services that are novel or unprecedented, no warranty is offered or made that all services performed by SVTC will be successful or that the goals of the Customer will be achieved.

1.2 Customer Limited Warranties. Customer represents and warrants that (i) Customer has the full right and authority to enter into this Agreement and grant the rights and licenses granted herein; (ii) Customer has not previously granted and will not grant any rights that prevent Customer from fulfilling its obligations under this Agreement; and (iii) Customer will comply with all applicable laws and regulations in connection with its performance under this Agreement. Customer warrants that it has fully disclosed information to SVTC in advance regarding any hazardous or toxic materials. Customer further warrants that none of the wafers or other materials processed by SVTC will be used in or on human subjects, experimental or otherwise, without SVTC's prior written consent.

1.3 Disclaimer of Warranties. EXCEPT AS EXPRESSLY STATED IN THIS AGREEMENT OR IN A SCHEDULE ATTACHED HERETO, SVTC AND CUSTOMER EACH EXPRESSLY DISCLAIM ANY AND ALL REPRESENTATIONS, WARRANTIES OR CONDITIONS, RELATING TO ANY TECHNOLOGY OR SERVICES PROVIDED UNDER THIS AGREEMENT, WHETHER EXPRESS, IMPLIED, OR STATUTORY, INCLUDING ANY WARRANTIES OF TITLE, NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

8. LIMITATION ON LIABILITY

1.1 Damages Waiver. EXCEPT FOR THE BREACH OF A CONFIDENTIALITY OBLIGATION, AND EXCEPT FOR AN INDEMNIFICATION OBLIGATION UNDER THIS AGREEMENT, AND EXCEPT FOR MISCONDUCT OR NEGLIGENT ACTS OF CUSTOMER PERSONNEL THAT INTERFERE WITH THE NORMAL OPERATIONS OF THE FAB, IN NO EVENT SHALL EITHER PARTY BE LIABLE TO THE OTHER, OR TO ANY THIRD PARTY CLAIMING THROUGH OR UNDER SUCH PARTY, FOR ANY LOST PROFITS, LOSS OF DATA, EQUIPMENT DOWNTIME OR FOR ANY INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, EVEN IF SUCH PARTY HAS BEEN ADVISED OF THE POSSIBILITY THEREOF.

1.2 Liability Cap. EXCEPT FOR CLAIMS BASED ON BREACHES OF A CONFIDENTIALITY OBLIGATION, AND EXCEPT FOR AN INDEMNIFICATION OBLIGATION UNDER THIS AGREEMENT, , AND EXCEPT FOR MISCONDUCT OR NEGLIGENT ACTS OF CUSTOMER PERSONNEL THAT INTERFERE WITH THE NORMAL OPERATIONS OF THE FAB, IN THE EVENT THAT ANY LIABILITY IS IMPOSED ON EITHER PARTY HEREUNDER, THE AGGREGATE AMOUNTS PAYABLE BY EITHER PARTY TO THE OTHER BY REASON THEREOF SHALL NOT EXCEED THE AMOUNT PAID OR PAYABLE BY CUSTOMER TO SVTC DURING THE TWELVE (12) MONTHS PRECEDING THE CLAIM TO WHICH SUCH LIABILITY RELATES.

1.3 Acknowledgement. Each party acknowledges that the foregoing limitations are an essential element of the Agreement between the parties and that in the absence of such limitations the pricing and other terms set forth in this Agreement would be substantially different. Customer acknowledges that the risk of its acts may interfere with the normal operations of the Line and that it has been advised to exercise special caution in its activities in the fab.

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9. CONFIDENTIALITY

1.1 Obligations. All Confidential Information exchanged between the parties pursuant to this Agreement shall not be disclosed by the recipient to anyone except its own employees, consultants or subcontractors or those of its Affiliates, who have a need to know such Confidential Information consistent with the purposes of this Agreement and who have been advised of the confidential nature and who have been contractually obligated to observe the terms and conditions hereof; nor shall Confidential Information be used by the receiving party for any purpose other than exercising its rights or fulfilling its obligations under this Agreement. Parties shall not disclose confidential information of third parties without the owner's prior consent. Parties shall at all times and notwithstanding any termination or expiration of this Agreement hold received Confidential Information in strict confidence with at least the degree of care it uses for its own confidential information and with not less than a legally reasonable degree of care. Recipient's obligations to maintain confidentiality shall survive termination of the Agreement and shall be binding upon the Recipient's heirs, successors and assigns. Upon request of the disclosing party, copies and embodiments of the disclosing party's Confidential Information shall be promptly returned to the disclosing party by the receiving party, unless such copies are required to fulfill the terms of this Agreement. Upon termination of this Agreement for any reason, each party shall promptly return to the other party all Confidential Information provided by the other party, including all copies, except that a receiving party may keep one copy solely for archival purposes. If either party becomes an unauthorized disclosure, even if not confirmed, it shall promptly notify the original disclosing party and promptly take reasonable actions to mitigate the effects of the unauthorized disclosure.

1.2 Independent Development. The disclosing party acknowledges that the receiving party may currently or in the future be developing information internally, or receiving information from other parties, that is similar to provided Confidential Information. Nothing in this Agreement will prohibit the receiving party from developing or having developed for it products, concepts, systems or techniques that are similar to or compete with the products, concepts, systems or techniques contemplated by or embodied in the Confidential Information, provided that no Confidential Information is referenced, accessed or used and the receiving party does not violate its obligations under this Agreement. Parties shall have no obligation to limit or restrict the assignment of its employees or consultants as a result of their having had access to Confidential Information.

1.3 Terms of Agreement; Publicity. Parties shall not to disclose to any third party the financial terms of this Agreement without the prior written consent of the other party, except to its advisors, independent accountants, investors and others on a need-to-know basis under circumstances that reasonably ensure confidentiality, or to the extent required by law. Any press release relating to this Agreement that is issued by one party and which mentions the other party shall be jointly released and mutually agreed upon by the parties or, if released by one party, approved by the other party. Notwithstanding the foregoing, SVTC may disclose that Customer is a customer of SVTC and Customer may disclose that it is a customer of SVTC. Notwithstanding the foregoing, either party may disclose the terms of this Agreement to existing or potential acquirers or merger candidates; investment bankers, existing or potential investors, venture capital firms or other financial institutions or investors solely for purposes of obtaining financing, each of whom prior to disclosure must be bound by obligations of confidentiality and non-use no less stringent than those set forth in this Agreement.

10. NON-SOLICITATION

10.1 Non-solicitation. During the term of this Agreement and for one (1) year after expiration or termination of this Agreement, neither party shall, directly or indirectly, without the prior written consent of the other party solicit, encourage, or take any other action which is intended to induce or encourage, any employee of the other party to terminate his or her employment with the other party. Customer shall not directly or indirectly, without prior written consent of the other SVTC customer solicit, encourage, or take any other action that is intended to induce or encourage, any employee of another customer working on the SVTC premises to terminate his or her employment with the other customer.

11. TERM AND TERMINATION

1.1 Initial Term. Unless terminated earlier pursuant to the terms and conditions of this Agreement, this Agreement shall commence on the Effective Date and shall remain in force for two (2) year(s) from the Start Date. The Agreement will automatically renew thereafter for additional one (1) year terms, unless either party notifies the other party in writing at least thirty (30) days prior to the expiration of the then-current term of its intent not to renew the Agreement for any further additional term.

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1.2 Early Termination

(a) Customer may terminate this Agreement or any Schedule after the Start Date upon giving SVTC at least thirty (30) days written notice. At the same time as giving notice of termination for convenience, SVTC shall invoice and Customer shall make a non-refundable payment to SVTC for all Services provided under this proposal up to and including the date of final termination net 30.

(b) Either party may terminate this Agreement upon written notice as set forth in Section 12.4 below in the event of a Force Majeure event.

1.3 Termination for Breach. Either party to this Agreement may terminate this Agreement in the event the other Party materially breaches this Agreement and does not cure such breach within thirty (30) days after written notice thereof by the non-breaching party.

1.4 Customer Equipment and Personnel. If applicable, then no later than the date of termination or expiration of this Agreement, Customer shall remove all of its equipment and shall cause all Customer Personnel to have removed all of their personal property from the SVTC premises. After that date, no such persons shall have any right to access the SVTC premises, except such reasonable access as SVTC and Customer shall agree in advance in writing in furtherance of the purposes hereof. Unless otherwise agreed, access badges and passwords will be disabled on the date of termination or expiration of this Agreement.

1.5 Survival; Effect of Termination. Sections 1, 4, 5.2 (unless Customer materially breachs an obligation under this Agreement), 6, 7, 8, 9, 10 (for one year following expiration or termination of the Agreement), 11.5 and 12 shall survive any termination or expiration of this Agreement. Except for purposes of exercising continuing license rights hereunder, upon termination or expiration of this Agreement, each party shall return or destroy any Confidential Information of the other party then in its possession.

12. MISCELLANEOUS

1.1 Governing Law. The rights and obligations of the parties under this Agreement shall not be governed by the provisions of the 1980 United Nations Convention on Contracts for the International Sale of Goods or the United Nations Convention on the Limitation Period in the International Sale of Goods, as amended. This Agreement and any dispute arising from the performance or breach hereof shall be governed by and construed and enforced in accordance with the laws of the State of Delaware, without reference to conflicts of laws provisions.

1.2 Assignment. This Agreement shall not be assigned by either party, whether voluntarily or involuntarily or by operation of law, in whole or in part, to any other entity without the prior written consent of the other party, which consent shall not unreasonably be withheld, conditioned or delayed. Notwithstanding the foregoing, either party may assign this Agreement to an Affiliate, without the other's prior consent, subject to providing written notice of such assignment. Further, upon written notice to the other party, either party may assign this Agreement to a successor in interest, upon a merger, acquisition, reorganization, change of control, or sale of all or virtually all of the assets of the assigning party, and any such assignment shall not require the consent of the non-assigning party. Any assignment in violation of this Section 13.3 shall be null and void from the beginning, and shall be deemed a material breach of this Agreement.

1.4 Force Majeure. Neither party shall be liable to the other in any way whatsoever for any failure or delay in performance of any of the obligations under this Agreement (other than obligations to make payment), arising out of any event or circumstance beyond the reasonable control of such party (including, war, rebellion, civil commotion, strikes, lock-outs or industrial disputes; fire, explosion, earthquake, acts of God, flood, drought or bad weather; the unavailability of deliveries, supplies, software, disks or other media or the requisitioning or other act or order by any government department, council or other constituted body). If either party's performance is prevented by a force majeure event for a period of more than forty-five (45) days, the other party may terminate this Agreement without further obligation or liability, subject to any payment amounts due and payable immediately prior to the commencement of such force majeure event.

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1.5 Compliance with Law. In performing its duties under this Agreement, each party shall at all times comply with all applicable international, federal, state and local laws and shall not engage in any illegal or unethical practices. Without limiting any of the foregoing, each party agrees to comply with all applicable US and foreign export control laws and regulations.

1.6 Waiver. Failure or neglect by either party to enforce at any time any of the provisions hereof shall not be construed nor shall be deemed to be a waiver of such party's rights hereunder nor affect the validity of the whole or any part of this Agreement nor prejudice such party's rights to take subsequent action.

1.7 Independent Contractors. It is agreed and understood that neither party is the agent, representative or partner of the other and neither has the authority or power to bind or contract in the name of or to create any liability against the other party in any way or for any purpose. It is understood that each party is an independent contractor. Each party expressly reserves the right to enter other similar agreements with other parties on the same or on different terms.

1.8 Notices. All notices, requests and other communications hereunder shall be in writing and shall be (a) personally delivered or (b) sent by facsimile and registered or certified mail, return receipt requested, postage prepaid, in each case to the respective address specified below, or such other address as may be specified in writing to the other party hereto:

To SVTC:

SVTC, LLC
3901 North First Street San Jose, CA 95134 Attn: […***…]
cc: Legal Department

To Customer:

BioNanomatrix, Inc.
3701 Market St, 4th Floor Philadelphia, PA 19104
Attn: Michael Boyce-Jacino, President and CEO

Notices shall be deemed received on the earlier of the following: (i) notices delivered by hand or sent by fax shall be deemed received the first business day following such delivery or sending; and (ii) notices which have been posted or sent via courier shall be deemed received on the date of the courier's delivery receipt.

1.9 Modification. No amendment or modification of any provision of this Agreement shall be effective unless in writing signed by both parties hereto. No provision of this Agreement shall be varied, contradicted or explained by any oral agreement, course of dealing or performance or any other matter not set forth in an agreement in writing and signed by both parties.

1.10 Severability. In the event that any clause, sub-clause or other provision contained in this Agreement shall be determined by any competent authority to be invalid, unlawful or unenforceable to any extent, such clause, sub-clause or other provision shall to that extent be severed from the remaining clauses and provisions, or the remaining part of the clause in question, which shall continue to be valid and enforceable to the fullest extent permitted by law.

1.11 Headings; Construction. The headings to the clauses, sub-clause and parts of this Agreement are inserted for convenience of reference only and are not intended to be part of or to affect the meaning or interpretation of this Agreement. The terms "this Agreement," "hereof," "hereunder" and any similar expressions refer to this Agreement and not to any particular Section or other portion hereof. The Parties hereto agree that any rule of construction to the effect that ambiguities are to be resolved against the drafting Party will not be applied in the construction or interpretation of this Agreement. As used in this Agreement, the words "include" and "including," and variations thereof, will be deemed to be followed by the words "without limitation."

1.12 Counterparts. This Agreement may be executed in multiple counterparts, each of which shall be deemed an original and all of which together shall constitute one instrument.

1.13 Entire Agreement. This Agreement, together with the Schedules and any exhibits attached to the Schedules, listed below, all of which are hereby incorporated into this Agreement by reference, supersedes any arrangements, understandings, promises or agreements made or existing between the parties hereto prior to or simultaneously with this Agreement and constitutes the entire understanding between the parties hereto. It is acknowledged that the terms of this Agreement have been negotiated between the parties.

LIST OF ATTACHMENTS. Following is a list of attachments to this Agreement, including all Schedules and Exhibits. Each future added attachment must include a dated Amendment cover page or provision referencing this Agreement and must be executed by all parties.

Customer Managed Project Services Schedule Exhibit A - Proposal

Exhibit B - Equipment List

Exhibit C — Insurance Requirements

Exhibit D — […***…] — deliverables, timeline, details and specifications quoted are goals only and not binding on SVTC. Actual project work will be as specified in Exhibit A. IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be duly executed and delivered in duplicate originals as of the date first above written.

	SVTC Technologies, Inc.		**BioNanomatrix, Inc.**
Signature:	/s/ Jon Myers	**Signature:**	/s/ Michael Boyce-Jacino
Printed Name:	Jon Myers	**Printed Name:**	Michael Boyce-Jacino
Title:	Vice President, Global Sales	**Title:**	President & CEO
Date:	February 19, 2009	**Date:**	March 23, 2009

CUSTOMER MANAGED PROJECT SERVICES SCHEDULE

This **Customer Managed Project Services Schedule** (the "**Schedule**") is entered into effective as of March , 2009 ("Effective Date") between **SVTC TECHNOLOGIES, LLC**, and BioNanomatrix, Inc., ("Customer") as an attachment to the Master Services Agreement ("Agreement"), between the parties, dated March 2, 2009. Capitalized terms used but not defined herein have the meanings ascribed to them in the Agreement. All terms and conditions in this Schedule are in addition to the terms and conditions set forth in the Agreement. In the event of any conflict between the provisions of this Schedule and the Agreement, the Agreement shall govern unless explicitly superseded in this Schedule.

Customer desires access to the fab and other premises of SVTC in connection with the provision of services. Customer Personnel may operate SVTC equipment and have other capabilities as provided in this Schedule.

1. DEFINITIONS

1.1 "***Activity***" or "***Move***" shall mean one wafer going through one semiconductor wafer production process step as delineated by SVTC in its normal operating practice. A semiconductor wafer production process step constitutes the actions performed and processes, procedures or associated equipment used in a single physical transformation of a wafer or one or more layers thereon, including: (i) […***…] (ii) […***…] (iii) […***…] (iv) […***…] (v) […***…]; and (vi) […***….

1.2 "***Activity Allocation***" shall mean the allocation of Activities set forth in Exhibit A attached hereto.

1.3 "***Customer Equipment***" shall mean any equipment on the Line owned or installed by Customer and shall include any upgrades thereto.

1.4 "***Engineering Services***" means services performed by SVTC's personnel, agents or subcontractors.

1.5 "***Minimum Batch Size***" shall mean the minimum total number of wafers in a Process Batch.

1.6 "***Moves per Inventory***" or "***M/I***" is defined as the activities generated in a given day divided by the average Work In Progress ("WIP") that is not on hold for engineering development or on problem lot for engineering evaluation.

1.7 "***Non-Hold WIP***" shall mean semiconductor wafers that can be processed and are not subject to any move restrictions by Customer. The current standard procedure for calculating Non-Hold WIP is as follows:

Daily Required Non-Hold WIP = […***…] […***…]

1.8 "***Product***" means a wafer manufactured by SVTC for Customer hereunder prior to qualification by Customer per Customer's qualification specifications, excluding all Prototypes.

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1.9 "***Prototype***" means prototypes of Products provided to Customer by SVTC.
1.10 "***Problem Lot***" means a Process Batch that is not moveable due to unforeseen issues that must be resolved by engineering.
1.11 "***Process Lot***" or "***Process Batch***" shall mean a group of wafers that are processed together as a group.
1.12 "***Production Product***" means products or wafers ordered by Customer after qualification and issuance of a prototype approval by Customer.
1.13 "***Standard Operating Procedure***" or "***SOP***" shall mean SVTC's then current standard administrative operating procedure, including the standard operating manual, specifications, and other applicable documentation,. . SVTC may update the SOP from time to time in its sole discretion.
1.14 "***Start-Up Costs***" shall have the meaning set forth in Exhibit A and which may include a separate "***Library Access Fees***" for the applicable process libraries.
1.15 "***Wafer Starts***" shall mean the number of new wafers that will be allowed.

2. PROCESS OPERATIONS

2.1 Activity Allocation to Customer.

1.1.1 SVTC will allocate Wafer Starts on a weekly basis and review and assign Activities on a daily basis, and shall provide the detail of its Activity Allocation in accordance with the process described in Exhibit A attached hereto.

1.1.2 Subject to the terms and conditions set forth herein, the allocation of Activities to Customer will be made by SVTC in its sole discretion and in accordance with SVTC's SOP for the allocation of Activities among SVTC's Customers, provided, that allocation of Activities to Customer for a specific period of time shall not be less than the amount provided for such period in Exhibit A unless agreed to by Customer.

1.1.3 Customer will have the responsibility for maintaining Customer's Non-Hold WIP at levels defined by SVTC to ensure that it receives its Activity Allocation. SVTC will not be held accountable for Activity Allocations missed by Customer if Customer does not maintain the Non-Hold WIP level required by SVTC. The current standard procedure for calculating Non-Hold WIP is as set forth in this Schedule A, Section 1.7, above.

1.1.4 The minimum Process Batch size is […***…] wafers for wafers in the Pre-Prototype, Prototype and Production product Phases. Any process batch that is smaller than […***…] wafers will be charged as if […***…] wafers are in the Process Batch, thus the minimum Activity charge is […***…] for any step. The Maximum Process Batch size is […***…].

2.2 Carry-forward. If for any reason whatsoever Customer does not use Activities or engineering hours allocate to the Customer for the project (as defined in Exhibit A), Customer shall have the right to carry forward either the total unused Activities and total unused engineering hours, or up to […***…] Activity and engineering hour Allocation (as defined in Exhibit A), whichever is less, for a period of up to […***…] beyond the termination date of the Agreement. If the Carry Forward is not used within the […***…], any residual of the Carry Forward Allocation will terminate.

2.3 Additional Allocations. Customer may request to increase its Activity Allocation upon thirty (30) days' prior written notice. Customer may request an increase in its Activity Allocation only up to an additional […***…] per fiscal quarter. Any increased Activity Allocation is subject to an increased payment as defined in attached Exhibits. Additional Allocations shall be provided at SVTC's sole discretion.

3. PROCESS MANAGEMENT

3.1 SVTC shall exercise day-to-day managerial authority over the semiconductor wafer fabrication facilities, referred to as the "**Line**," including over the allocation of Activities and all aspects of the operation, development and planning of the Line, consistent with the provisions of this Agreement.

3.2 Customer shall appoint employees with decision-making authority to an operating committee ("Operating Committee") to work with SVTC. The Operating Committee shall meet in person or telephonically once every […***…] at a regularly scheduled time to review operational results and approve future operational matters, including changes to the Line operating procedures applicable to Customer; provided however, that SVTC shall retain ultimate control over any changes to the Line and its operating procedures. The Operating Committee shall attempt to resolve by good faith negotiations any operating disputes that arise with respect to the Line, or any other disputes arising under this Agreement, except as specifically set forth herein.

3.3 SVTC will hold a daily Line operations meeting in which the daily Activities on the Line are reviewed, discussed and planned; a Customer representative is expected to attend all operations meetings.

3.4 Customer shall submit for prior written approval to the Operating Committee or its designee, a list of all proposed operations, including all equipment intended to be used. Failure to adhere to the approved list may be considered grounds for termination as provided in Section 12.3 of the Master Services Agreement.

3.5 SVTC shall have no liability nor be responsible for any costs or damages arising out of or related to the work of Customer Personnel including but not limited to results other than those desired by Customer in the wafers processed on the Line solely by Customer Personnel.

4. EQUIPMENT

4.1 The Line. The Line is equipped to run various process technologies utilizing the equipment listed in Exhibit B. SVTC may update this list from time to time in its sole discretion.

4.2 Equipment Ownership on the Line. Except as may otherwise agreed in writing between the parties, SVTC will own the Line including all its equipment and Intellectual Property Rights. Customer acknowledges that the Line including all of the equipment, is used by multiple customers and that Customer is obligated under this Schedule and the Agreement to avoid misusing any equipment, causing any damages, or causing Line operations to be interrupted.

4.2.1 If Customer damages any equipment other than it own, Customer agrees to indemnify SVTC without limitation for the costs of repair, replacement, or extraordinary servicing.

4.2.2 If Customer damages any equipment other than it own, or otherwise causes any disruption to the Line, and if the forgoing results in lost revenue to SVTC, or if claims are made against SVTC by other customers for delays attributable to Customer, then Customer agrees to indemnify SVTC without limitation for all such claims and lost revenue.

4.2.3 Sections 4.2.1 and 4.2.2 shall not apply if Customer has strictly adhered to the operations approved by the Operating Committee, all Customer use of equipment was within normal or approved parameters, and all Customer Personnel involved had satisfactorily completed all required training.

4.2.4 No Customer Personnel except those who have satisfactorily completed the required training to the satisfaction of SVTC, whether or not paid for, shall be allowed into the fab or to operate SVTC equipment; SVTC reserves the right at its sole discretion, to determine if Customer Personnel have achieved sufficient knowledge and understanding of the training materials to be considered having satisfactorily completed the training. If SVTC reasonably determines that someone needs more or retraining, it may require such training to allow continued access and use privileges.

4.3 Customer Equipment.

1.1.1 Upon Customer's request, SVTC will, in its sole discretion, permit Customer to install Customer Equipment on SVTC premises. SVTC, in its sole discretion, may allow Customer to make modifications to the applicable SVTC premises reasonably necessary for the installation and operation of the Customer Equipment. Customer shall bear the responsibility and cost of such installation, project management and clean room rental. Customer shall pay the applicable taxing authority any tax invoice with respect to Customer Equipment. Customer shall also pay all costs to upgrade such Customer Equipment. Any such upgrade will be performed in accordance with Customer's specifications, but all such specifications are subject to the pre-approval of SVTC in its sole discretion. Customer has the right to remove any Customer Equipment at any time, provided that the removal minimizes disturbance to the Line and is done with reasonable advance written notice to SVTC and solely at Customer 's expense. Without limiting the foregoing, Customer shall bear all costs of installation, deinstallation and removal of Customer Equipment and any damages resulting therefrom.

1.1.2 Customer shall bear all costs associated with ownership of any Customer Equipment or upgrade, including all sales or use taxes or property taxes imposed on or otherwise determined on the basis of any such Customer Equipment or upgrade, and all insurance costs associated with any Customer Equipment.

1.1.3 SVTC shall have no responsibility to Customer for loss or damage to any Customer Equipment unless such damage or loss is caused by SVTC. Customer shall be responsible for securing insurance for Customer Equipment on SVTC premises. Customer shall be responsible for installation, all maintenance and repairs for Customer Equipment unless stated otherwise. Customer shall be responsible for maintaining Customer Equipment at a satisfactory working level defined by the equipment manufacturers listed uptime and operational quality specifications.

1.1.4 Customer shall allow SVTC access to Customer Equipment for safety and maintenance purposes as well as for other mutually agreed purposes. No SVTC Personnel except those who have satisfactorily completed the required training to the satisfaction of Customer, whether or not paid for, shall be allowed to operate Customer equipment; Customer reserves the right at its sole discretion, to determine if SVTC Personnel have achieved sufficient knowledge and understanding of the training materials to be considered having satisfactorily completed the training.

4.4 Use of Equipment. All equipment listed in Exhibit B may be used in manufacturing the products of either Party without cost to Customer other than such amount payable under Section 4. Customer Equipment shall only be used to manufacture Customer products or otherwise for the benefit of Customer and for no other purpose except during instances in which SVTC is the user of such customer owned equipment.

4.5 Access of Equipment. Customer shall not have access to equipment that is not included in Exhibit B under this Agreement unless the new equipment replaces a piece of equipment listed in Exhibit B or is otherwise added to Exhibit B by SVTC. Customer and SVTC may agree upon conditional access to SVTC-owned, non-replacement equipment as needed for newly added equipment.

4.6 Maintenance Down Time. Although the Line generally operates 24/7/365, occasionally the Line must be shut down in whole or in part for maintenance. Customer will be given notice of planned shut-downs in advance. If there is an unplanned shut-down, as may happen if there is an event beyond SVTC's control, SVTC will use commercially reasonable efforts to get the Line back up as soon as possible; Customer agrees that SVTC shall not be liable for any damages resulting from the aforementioned shut-downs.

5. EXPENSES

5.1 Training. Included in the Start-Up Costs shall be the number of hours as defined in any Exhibits attached hereto for up to […***…] from the Start Date of SVTC Engineering Services to be used for equipment training, wafer management training and integration support. The number of Customer Personnel who will be trained and/or the number of hours allocated to training Customer Personnel is limited to that stated in the attachments, however, if Customer desires later to train a greater number than agreed, SVTC shall provide such training at an additional charge.

5.2 Non-Recurring Engineering Expenses. After the initial set-up included in the Start-Up Costs, Customer will have the option to purchase from SVTC Engineering Services at a rate as defined in an attached Exhibits or in other documents attached to the Agreement such an Engineering Services Schedule. SVTC may increase the hourly rate from time to time in its sole discretion upon advance written notice. Customer understands that Engineering Services may not always be available due to staffing availability. The terms and conditions for such Engineering Services shall be set forth on a separate Schedule.

5.3 Reticle and Analytical Laboratory Services Expenses. Customer will have the option to purchase photomasks or to have analytical laboratory services through SVTC's approved vendors subject to specifically applicable terms and conditions.

5.4 Payment Terms. Customer will be invoiced monthly based upon Activities allocated as described in Section 2.1. The invoice will be for at least the minimum number of Moves equal to the monthly Activity Allocation. If the actual Moves for the preceding month are more than the Activity Allocation, the total Moves will be invoiced. Each SVTC invoice hereunder shall be accompanied by a detailed report containing Activity Allocation, actual Moves, quantity of Moves invoiced and other payment due and payable. Payment obligations under this Schedule shall survive any termination or expiration of this Schedule.

6. PREMISES SERVICES, SECURITY AND SUPPORT

6.1 Limited Support for Customer Personnel. Customer acknowledges that SVTC will not be providing support or facilities for Customer Personnel except as expressly set forth in the Agreement or it attachments, and in particular shall not make available clerical, administrative or technical support personnel other than for the limited purposes explicitly referred to herein. If requested by Customer for a designated number of Customer Personnel, and as agreed by SVTC, then in addition to cubicle or office space that may be made temporarily available to Customer Personnel, SVTC may make available office telephones and internet connectivity and may provide access to conference rooms (subject to allowing access to such rooms on an equal priority basis to other customers and SVTC needs), break rooms, printers, faxes, copiers, and equipment for engineering-only time for recipe development or optimization (subject to allowing access to such equipment to other SVTC customers as determined by SVTC in its reasonable judgment). SVTC will ensure that all Customer Personnel are provided prompt and unqualified access at all times to data and information residing on SVTC equipment and computers that is specific to Customer.

6.2 Status of Personnel. Customer acknowledges that Customer is responsible for the activities of all Customer Personnel on the SVTC premises and to assure compliance with all SVTC rules and guidelines. Customer has an affirmative duty to inform all Customer Personnel, including but not limited to agents, contractors or employees of affiliates of Customer, of their obligations under this Agreement. Customer Personnel who are other than immediate employees of Customer, including but not limited to agents, contractors or employees of affiliates of Customer, shall not enter or work within SVTC fab facilities without SVTC's prior written consent expressly naming each such individual.

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6.3 Security.

6.3.1 Customer acknowledges that the security of SVTC's facilities generally and of SVTC's computer systems and networks in particular is of paramount importance to SVTC and to all of SVTC's customers, including Customer. Customer Personnel are not authorized to enter any zone of SVTC's facilities other than the SVTC premises specified in the applicable Schedule or the parking lot associated with such SVTC premises unaccompanied by an authorized employee of SVTC. For security purposes, SVTC will require each one of the Customer Personnel to wear a security badge at all times that each is on SVTC property and to conform with all site policies and procedures, as updated from time to time by SVTC in its sole discretion.

6.3.2 Customer Personnel shall not access any SVTC computer or networking equipment except as agreed upon by SVTC on a case-by-case basis. If provided access, each one of the Customer Personnel shall be assigned his or her own individual password by SVTC in order to obtain any such access, and such individual may not share that password with any other Customer Personnel or others.

6.3.3 SVTC shall keep and maintain logs of access to its network and systems by Customer Personnel, and in the event SVTC discovers that any Customer Personnel has gained unauthorized access to any portion of SVTC's systems or network or has removed, used or disclosed any Confidential Information of SVTC or of any other SVTC customer, or if any Customer Personnel have otherwise failed to comply with SVTC's site policies and procedures, such persons may immediately have their access badge and passwords canceled and may be physically barred from SVTC premises; such persons' actions may be deemed a material breach of this Agreement by Customer.

6.4 Safety. When using the SVTC premises, Customer shall at all times comply with all of SVTC's environmental, health, security and safety site policies, procedures, and programs, and to ensure that all Customer Personnel also comply. SVTC will provide Customer copies of any such policies, as updated from time to time by SVTC in its sole discretion. It is Customer's responsibility to understand all site policies, procedures and programs relating to site security, environmental protection, safety and health and to ensure that the Customer Personnel also understand and comply with such policies, procedures, and programs. This includes chemical handling, lock-out-tag-out, EHS and OHS safety rules, and use of safety gear. Customer also understands that all chemicals brought onto the SVTC premises or any SVTC location must be approved on a case-by-case basis by SVTC in advance in order to maintain compliance with local, state and federal codes. The foregoing does not limit Customer's responsibility for compliance with all applicable law.

6.5 Insurance. Customer represents that it has procured, and at all times during the Term shall maintain, levels of insurance as necessary or as may be specified by SVTC to cover the activities and obligations of Customer and Customer Personnel while working on the SVTC premises. Customer shall provide evidence of insurance to SVTC on the Effective Date of this Agreement, and at other times upon request by SVTC. Depending upon the nature of Customer's activities on the premises, SVTC may require specific insurance levels and certificates in an attachment to this Agreement.

6.6 Third-Party Materials and Information. Except as otherwise set forth herein, Customer shall not permit Customer Personnel, to knowingly use, remove or tamper with any equipment, materials or documents of other customers that may be on the SVTC premises.

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7. ENGINEERING SERVICES

7.1 Work. Customer may request advanced engineering services including but not limited process development. Depending upon the nature and complexity of the requested engineering services, additional documentation may be required such as an SOW, that would include the number and qualifications of the desired engineers, the period of time needed, and what type of work is desired. SVTC will provide a written quote or proposal for such services and if mutually agreed, a written confirmation will be provided. SVTC will use commercially reasonable efforts to render the mutually agreed services by the projected completion dates. The manner and means by which SVTC chooses to complete such services are in SVTC's sole discretion and control. Unless otherwise agreed in writing, all SVTC engineering services pursuant to this section of the Schedule will be during its normal local weekday business hours (not fab hours); services required outside normal hours (including after hours weekdays and/or on weekends) shall be subject to SVTC staff availability and shall be charged at additional cost to Customer.

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Exhibit A Commercial Terms
For BioNanomatrix, Inc.'s Nanochannel Array Development

START DATE: 04-07-2009 **DURATION:** Six (6) Months

SVTC proposes the date above on which SVTC will begin providing the following services under the Master Services Agreement ("***Start Date***"). Project Duration commences upon the ("***Start Date***").

1.0 DESCRIPTION OF SERVICES:

SVTC shall provide access to SVTC's Line for the defined Project Duration commencing upon the Start Date in order to process silicon wafers in support of BioNanomatrix, Inc.'s Nanochannel Array Development. SVTC will use manufacturing processes that exist or are being developed by BioNanomatrix, Inc., and BioNanomatrix, Inc. will be allocated a specific number of Activities, as well as other support and services, as described herein ("Services"). SVTC shall use commercially reasonable efforts to perform the Services requested by BioNanomatrix, Inc., subject to the ability of SVTC to perform these Services on SVTC's existing equipment and equipment contributed by BioNanomatrix, Inc. using standard materials and process recipes that are compatible with the equipment and resources of SVTC.

1.1 SUMMARY OF SERVICES TO BE PROVIDED:

- […***…]
- […***…]
- […***…]
- […***…]
- […***…]

3.0 SVTC SERVICE FEES:

Development	**Fees**		**Frequency**
Fab Access • Included Activities[…***…] • On-Site Workspace for 1 cube for 1 engineer […***…]	[…***…]		[…***…]
Activity Fee for activities in excess of the included 600 activities		[…***…]	[…***…]
Engineering Services - Fixed Fee Process Engineering Support • Up to […***…] • Duration for 1 quarter		[…***…]	[…***…]
Engineering Services for hours exceeding contracted hours per quarter	[…***…]		[…***…]
Process Library Access	[…***…]		[…***…]
Mask Design Services (including reticles) - Estimate	[…***…]		[…***…]
Analytical Services - Estimate	[…***…]		[…***…]

Prototype Production	**Fees**	**Frequency**
Prototype production - 2 months estimated duration **-** […***…] **Activities** **- Excess Activities at** […***…] **- Minimum lot:** […***…]	[…***…]	[…***…]
Prototype production Engineering Support - 2 months **-[…***…]** **- Excess Hours at** […***…]	[…***…]	[…***…]

Volume Production	**Fees**	**Frequency**
Volume Production		
- 101-200 wpm:	[…***…]	Per Wafer
- 201-300 wpm:	[…***…]	Per Wafer
- 301-400 wpm:	[…***…]	Per Wafer
- > 400 wpm:	[…***…]	Per Wafer
[…*…]**		
[…*…]**		
[…*…]**		

4.0 TERMS:

1) Not withstanding herein or within related agreements and documents, SVTC agrees that if for any reason whatsoever Customer does not use Activities or engineering hours allocate to the Customer for the project (as defined in Exhibit A), Customer shall have the right to carry forward either the total unused Activities and total unused engineering hours, or up to […***…] *Activity and engineering hour Allocation (as defined in Exhibit A), whichever is less, for a period of up to* […***…] *beyond the termination date of the Agreement. If the Carry Forward is not used within the* […***…]*, any residual of the Carry Forward Allocation will terminate.*

EXHIBIT B

Equipment List — BioNanomatrix Vision Corporation

Table B1 — Equipment with Activity Multipliers and with Access Only Through SVTC Operation and/or Engineering — No Direct Hands-on Usage

[…*…]**

Table B2, P1 — Equipment with Access Only Through SVTC Operation and/or Engineering — No Direct Hands-on Usage

(Note – List includes tools both with and without activity multipliers.) […***…]

Table B2, P2 — Equipment with Access Only Through SVTC Operation and/or Engineering — No Direct Hands-on Usage
(Note – List includes tools both with and without activity multipliers.)

[…***…]

Table B2, P3 — Equipment with Access Only Through SVTC Operation and/or Engineering — No Direct Hands-on Usage
(Note – List includes tools both with and without activity multipliers.)

[…***…]

Table B2, P4 — Equipment with Access Only Through SVTC Operation and/or Engineering — No Direct Hands-on Usage
(Note – List includes tools both with and without activity multipliers.)

[…***…]

Exhibit C

Insurance Requirements for SVTC Customers

Within the timeframe specified in the Agreement stating insurance requirements or when requested by SVTC, Customer must provide Certificates of Insurance verifying it has the following types of insurance (including an attachment specifying additional or named insureds and any waiver endorsements). If the Agreement requires limits other than those below, the limits stated in the Agreement shall supersede those below. Customer agrees to maintain all such applicable insurance during its operations at SVTC.

Note that the following insurance requirements apply only to Customers working on SVTC premises using SVTC equipment. If there will be no use of SVTC equipment, the below insurance requirements do not apply. If the nature of Customer's work on SVTC premises changes during the term of the Agreement, the insurance requirements below may be imposed, waived or re-imposed. By way of example, if a customer desires access to the fabs but does not actually use the equipment , a lesser level of insurance may be acceptable, subject to the level being increased if the customer later starts directly using SVTC equipment.

Commercial General Liability Coverage: Policy must name SVTC, Technologies LLC., ("SVTC"), as an additional insured and include a waiver of subrogation in favor of SVTC; include Broad Form Property Damage, Blanket Contractual Liability (covering liability assumed by Supplier), Premises/Operations, and Products/Completed Operations.

$ […***…] General Aggregate
$ […***…] Products-Completed Operations Aggregate (as needed)
$ […***…] Personal & Advertising Injury $ 1,000,000 Each Occurrence
$ […***…] Fire Damage (Any one fire)
$ […***…] Medical Expense (any one person)

Excess/Umbrella Coverage: This policy must be in force in addition to the underlying coverage required above without any gaps and subject to all of the same requirements as the underlying coverage so that the total amount of insurance coverage (underlying plus umbrella) equals the following:

$ […***…] Each occurrence and general aggregate

AMEND462693-001

AMENDMENT 1

This Amendment, ("Amendment"), dated July 13, 2009 ("Effective Date") is to the Master Services Agreement dated March 2, 2009, and Exhibit A - Commercial Terms dated April 7, 2009 ("Agreement") between SVTC Technologies, LLC ("SVTC"), and BioNanomatrix, Inc. ("Company"). The Agreement mandates that all changes must be in a writing signed by the parties. Except as provided below, all the provisions of the Agreement shall remain in effect and apply to the amended language. Accordingly, the parties agree to the following:

1) Exhibit A states the Commercial Terms for development phase of the described six month Company project. Section 3.0 of Exhibit A states the Service Fees including the amount charged for Engineering Services which currently provides that Engineering Services hours in excess of […***…] will be billed at the rate of […***…].
2) It is hereby agreed to amend the forgoing language to provide that Engineering Services hours in excess of […***…] will be billed at the rate of […***…]. It is also agreed that this reduction only applies during the period of time ending September 25, 2009, when development is complete.

Effect of this Amendment. In the event of any conflict between the Agreement and this Amendment, this Amendment shall control. Except as amended or otherwise set forth in this Amendment, all terms and conditions of the Agreement remain in full force and effect and shall apply to this Amendment and the interpretation thereof.

With due authority from our respective companies, we hereby signify our consent to this Agreement by signing below,

SVTC Technologies, LLC

Signature: /s/ Brian A. Stein
Printed Name: Brian A. Stein
Title: CFO
Date: October 2, 2009

Customer: BioNanomatrix, Inc.

Signature: /s/ Michael Boyce-Jacino
Printed Name: Michael Boyce-Jacino
Title: President and CEO
Date:

BioNanomatrix
AMEND462693-002

AMENDMENT 2

This Amendment 2, ("Amendment"), dated October 21, 2009 ("Effective Date") is to the Master Services Agreement dated March 2, 2009 ("Agreement") between SVTC Technologies, LLC ("SVTC"), and BioNanomatrix, Inc. ("Company"). The Agreement mandates that all changes must be in a writing signed by the parties. Except as provided below, all the provisions of the Agreement, including section 11, shall remain in effect and apply to the amended language. Accordingly, the parties agree to the following:

1) The Agreement included an Exhibit A which included specific commercial terms to cover the development phase of the ongoing project. The services and charges in Exhibit A were for work during the six month period starting April 7, 2009. The parties are now ready to proceed to the next phase in the project . Note that an Amendment 1, dated July 13, 2009, was executed but is not relevant to this Amendment 2.
2) Pursuant to Section 2.1 of the SVTC Agreement, the SVTC Agreement is hereby amended to include attached Exhibit A2 describing services that will be provided by SVTC to Company for the next phase. SVTC will provide Company the services described in Exhibit A2 for the prices set forth therein, subject to any additional terms and conditions set forth therein. All work by SVTC for the project described in Exhibit A2 shall be pursuant only to the Agreement as amended herein, and not pursuant to any other agreements.

Effect of this Amendment. In the event of any conflict between the Agreement and this Amendment, this Amendment shall control. Except as amended or otherwise set forth in this Amendment, all terms and conditions of the Agreement remain in full force and effect and shall apply to this Amendment and the interpretation thereof.

LIST OF ATTACHMENTS: Following is a list of attachments to this Amendment, including all Schedules and Exhibits. Any future added attachment must include a dated Amendment or provision referencing the Agreement and must be executed by all parties.

Exhibit A2

(signatures on next page)

With due authority from our respective companies, we hereby signify our consent to this Agreement by signing below,

SVTC Technologies, LLC

Signature: /s/ Brian A. Stein
Printed Name: Brian A. Stein
Title: CFO
Date: 10/23/09

Customer: BioNanomatrix, Inc.

Signature: /s/ Lorraine G. LoPresti
Printed Name: Lorraine G. LoPresti
Title: VP – Finance & Administration
Date: 10/22/2009

BioNanomatrix
AMEND462693-002

Exhibit A2 Commercial Terms
For BioNanomatrix, Inc.'s Revised Nanochannel Array Development Project

START DATE: 10-19-2009 **DURATION:** Six (6) Months*

SVTC proposes the date above on which SVTC will begin providing the following services under the Agreement ("Start Date"). *Project Duration commences upon the ("Start Date") and shall continue for six months unless extended as provide in section 6, 2), below.

1.0 DESCRIPTION OF SERVICES:

SVTC shall provide services for the defined Project Duration in order to develop and process experimental prototype silicon wafers in support of BioNanomatrix, Inc.'s Revised Nanochannel Array Development Project. SVTC will use manufacturing processes that are being developed and BioNanomatrix, Inc. will be allocated a specific number of Activities, as well as other support and services, as described herein ("Services"). SVTC shall use commercially reasonable efforts to perform the Services requested by BioNanomatrix, Inc., subject to the ability of SVTC to perform these Services on SVTC's existing equipment and equipment contributed by BioNanomatrix, Inc. using standard materials and process recipes that are compatible with the equipment and resources of SVTC.

1.2 SUMMARY OF SERVICES TO BE PROVIDED:

- Fab Services for experimental prototype wafers
- Engineering Services
- Process Library Access

3.0 SVTC SERVICE DEFINITIONS:

Fab Access Services:

1. […***…]
2. […***…]
3. […***…]
4. […***…]
5. […***…]
6. […***…]

Engineering Services: (in addition to those included within the Activities pricing)

1. Contracted engineering time may be utilized for the following development tasks a. […***…]
   b […***…] c. […***…]
   d. […***…]
   e. […***…]

2. These services are to be executed in collaboration with Company

Process Library Services:

1. […***…]

4.0 ADDITIONAL SERVICES:

Additional Services are subject to availability at SVTC's sole discretion for additional fees

Reticles […***…]
Analytical Services […***…]

BioNanomatrix
AMEND462693-002

5.0 SVTC ESTIMATED SERVICE FEES:

BioNanomatrix Fees Summary	**Cal Q4'09**	**Cal Q1'10**
[…***…]	[…***…]	
[…***…] […***…] […***…] […***…]		
[…***…] […***…] […***…] […***…] […***…] […***…]		
[…***…]	[…***…]	[…***…]
Total Revised Prototype Wafers	**[…***…]**	**[…***…]**
[…***…]	[…***…]	[…***…]
- […***…]		
- […***…]	- […***…]	
- […***…]	- […***…]	
- […***…]		
IP License Fee (actual - not estimated)	[…***…]	[…***…]
Total Alpha2 Development	**[…***…]**	**[…***…]**
Sub-Total (By Quarter)	**[…***…]**	**[…***…]**
TOTAL		**[…***…]**

AMEND462693-001*3*0735133165169523093351257156528849427565203603*1*1

6.0 TERMS:

1) *The project summary in Section 5.0 represents a non-binding total estimated project cost and timeline. However, the Minimum Financial Commitment Fee for the Duration is […***…]. As part of this Amendment, Company commits to have […***…] Prototype wafers constructed on the existing […***…] flow upon execution of this Amendment.*
2) *Fees for all services actually provided by SVTC to Company. shall be invoiced at the end of each SVTC fiscal month and payment shall be due within 30 days. IP License fees shall be billed at the end the first month of each quarter. Company will have the option to extend the Duration by up to three months, at the same rates as above, in the event that the above development services are not concluded within six months; to exercise the extension, Company must notify SVTC in writing at least thirty days prior to the end of the initial six month Duration. Should the extension occur, SVTC will waive the associated quarterly IP License fee for the extension.*
3) *All invoicing shall follow SVTC fiscal month start and end dates.*
4) *Additional Activities, Engineering Hours, Additional Tool Training, access to additional equipment and resources, and other Extraordinary Expenses ("Additional Services) shall be made available at SVTC's sole discretion and shall be agreed to in writing prior to being performed by SVTC. Company shall pay for all Additional Services per the terms of the Agreement, with rates fixed at […***…] and […***…].*
5) *No Company terms and conditions, including but not limited to any stated on Company's Purchase Orders or other documents, shall apply to SVTC's services.*
6) *Outsourcing charges for any outsourced steps are estimates only and may be subject to additional fees and/or outsource non-reoccurring engineering charges. If outsourcing occurs, […***…].*

1.1 LICENSED TECHNOLOGY:

The Services listed above and SVTC's process technology, including recipes and steps, used in the performance of services shall be provided and licensed to Company under the terms, conditions and limitations of the Agreement, which shall override and supersede any terms and conditions in any Company provided documents.

Table 1 Process Flows

[…*…]**

[…***…]

BioNanomatrix
AMEND462693-004
Initials: SVTC: JC Customer:

This Amendment 3, ("Amendment"), dated July 9, 2010 ("Effective Date") is to the Master Services Agreement dated March 2, 2009 ("Agreement") between SVTC Technologies, LLC ("SVTC"), and BioNanomatrix, Inc. ("Company"). The Agreement mandates that all changes must be in a writing signed by the parties. Except as provided below, all the provisions of the Agreement shall remain in effect and apply to the amended language. Accordingly, the parties agree to the following:

1) Previous draft of Amendment 3, dated in November, 2009, which was not finalized or executed, is superseded and replaced with this version of Amendment 3.
2) SVTC and Customer agree to again extend the expiration of the Commercial Terms in Exhibit A2 of Amendment 2 of the Agreement, which Customer previously extended, by exercising the option to extend the duration as stated in Section 6, sub-paragraph 2 of Exhibit A2, for a prior revised expiration date of July 19, 2010. By this Amendment the parties agree that the Commercial Terms in Exhibit A2 shall now extended to now expire on October 19, 2010.
3) SVTC agrees to […***…] for the duration of this extension.
4) During the duration of this extension SVTC shall invoice Customer at the end of each SVTC fiscal month for actual services provided and payment shall be due within 30 days.

Effect of this Amendment: In the event of any conflict between the Agreement and this Amendment, this Amendment shall control. Except as amended or otherwise set forth in this Amendment, all terms and conditions of the agreement remain in full force and effect and shall apply to this Amendment and the interpretation thereof.

With due authority from our respective companies, we hereby signify our consent to this Agreement by signing below,

SVTC Technologies, LLC

Signature: /s/ Jeffrey E. Calvello

Printed Name: ~~Brian A. Stein~~ JEFFREY E. CALVELLO
Title: ~~Chief Financial Officer~~ CORPORATE CONTROLLER
Date: July 20, 2010

Customer: BioNanomatrix, Inc.

Signature: /s/ Edward L. Erickson

Printed Name: Edward L. Erickson
Title: President & CEO
Date: 7/19/2010

BioNanomatrix
AMEND462693-005
Initials: SVTC: Customer:

This Amendment 4, ("Amendment"), dated September 23, 2010 ("Effective Date") is to the Master Services Agreement dated March 2, 2009 ("Agreement") between SVTC Technologies, LLC ("SVTC"), and BioNanomatrix, Inc. ("Company"). The Agreement mandates that all changes must be in a writing signed by the parties. Except as provided below, all the provisions of the Agreement shall remain in effect and apply to the amended language. Accordingly, the parties agree to the following:

1) The Agreement is hereby amended to include attached Exhibit A4 describing services that will be provided by SVTC for Customer starting on the Effective Date. SVTC will provide Customer the services described in Exhibit A4 for the fees set forth therein, subject to any additional terms and conditions set forth therein. Starting ~~September 23~~, 2010, attached Exhibit A4, including the service and fee provisions therein, shall replace and supersede the provisions of prior Exhibit A2 to the Agreement in its entirety. *October 15 JC LL*

Effect of this Amendment: In the event of any conflict between the Agreement and this Amendment, this Amendment shall control. Except as amended or otherwise set forth in this Amendment, all terms and conditions of the agreement remain in full force and effect and shall apply to this Amendment and the interpretation thereof.

LIST OF ATTACHMENTS: Following is a list of attachments to this Amendment, including all Schedules and Exhibits. Any future added attachment must include a dated Amendment or provision referencing the Agreement and must be executed by all parties.

Exhibit A4 - Commercial Terms

With due authority from our respective companies, we hereby signify our consent to this Agreement by signing below,

SVTC Technologies, LLC

Signature: /s/ Jeffrey E. Calvello

Printed Name: ~~Brian A. Stein~~ JEFFREY E. CALVELLO
Title: ~~Chief Financial Officer~~ CORPORATE CONTROLLER
Date: 10/20/2010

Customer: BioNanomatrix, Inc.

Signature: /s/ Lorraine G. LoPresti

Printed Name: Lorraine G. LoPresti
Title: VP – Finance & Admin, CFO
Date: 10/20/2010

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AMEND462693-005*1*3562676222612785742041677759144308475396900458 71*1*11

BioNanomatrix
AMEND462693-005
Initials: SVTC Customer:

Exhibit A4 Commercial Quotation
For BioNanomatrix, Inc.'s Alpha3.0 Technology

START DATE: 10-15-2010 **DURATION:** One (1) Year

SVTC proposes the date above on which SVTC will begin providing the following services under the Master Services Agreement ("Start Date"). Project Duration is the period of time for the project described in this Quotation.

1.0 DESCRIPTION OF SERVICES:

SVTC shall provide research and development services in support of BioNanomatrix, Inc.'s Alpha3.0 Technology. SVTC will start with semiconductor processes that exist or are being developed by BioNanomatrix, Inc., and will provide such research and development services, as well as other support as described herein (collectively, "Services"). SVTC shall use its best efforts, which shall be no less than commercially reasonable efforts, to perform the Services requested by BioNanomatrix, Inc.,in accordance with this Exhibit A4 subject to the ability of SVTC to perform these Services on SVTC's existing equipment and using standard materials and process recipes that are compatible with the equipment and resources of SVTC.

1.1 SUMMARY OF SERVICES THAT MAY BE PROVIDED:

- Fab Services
- Engineering Services
- Process Library Licenses

3.0 SVTC SERVICE DEFINITIONS:

Fab Access Services:

1. […***…]

2. […***…]

3. […***…]

4. […***…]

5. […***…]

6. […***…]

7. […***…]

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BioNanomatrix
AMEND462693-005
Initials: SVTC Customer:

Engineering Services: (Defined in the Agreement)

1. Contracted engineering time may be utilized for the following development tasks a. […***…]

b […***…] c. […***…]
d. […***…]
e. […***…]
f. […***…]

2. These services are to be executed in collaboration with customers direction and management

Library License Fee:
1. […***…]

4.0 ADDITIONAL SERVICES:**

Additional Training Services [***]
Additional Cubicles & Lockable Office Space Subject to availability priced upon request Reticles [***]
Analytical Services Full service capabilities available priced upon request

** Additional Services subject to availability

556253-1-1-11
AMEND462693-005*1*3562676222612785742041677759144308475396900458 71*1*11

5.0 SVTC SERVICE FEE SCHEDULE:

	Development Contract	Fees	Frequency
a)	**Fab Services**		
		[…***…]	
	Development Activity unit pricing	[…***…]	per
	Yield Engineering Activity unit pricing	[…***…]	per
d)	**Engineering Services - Process Engineering Support**		
	• Duration for 4 quarters		
	Engineering Services hours exceeding Included Hours	[…***…]	
f)	**Library License Fee**	[…***…]	
	• IP License Fee waived with 1 year contract commitment		
g)	**Analytical Services**	[…***…]	
	• […***…]		
g)	**Reticles**	[…***…]	
	Flexible spending with quarterly Financial Commitment	**[…***…]**	

*** Actual spend rate is expected to exceed the minimum financial commit. Predicted run rate based on scope of work is between $175 and $225K per quarter**

6.0 PILOT / LOW VOLUME PRODUCTION:

Wafers per year	Activity Pricing
100 – 1,200	[…***…]
12,000 – 3,000	[…***…]
> 3,000	[…***…]

- […***…]

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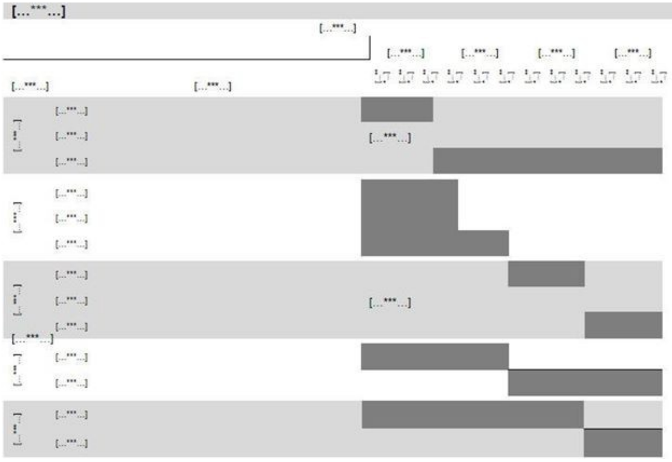
AMEND462693-005*1*3562676222612785742041677759144308475396900458 71*4*11

7.0 SCOPE OF WORK:

- **Alpha2.0 Chip Development Requirements**
  - **Remaining technical challenges:**
    - None; baseline process exists
  - **Estimated Scope:**
    - […***…]
      - […***…]
- **Alpha3.0 Chip Development Requirements:**
  - **Remaining technical challenges**
    - […***…]
    - […***…]
    - […***…]
  - **Estimated Scope:**
    - […***…]
    - […***…]
    - […***…]
      - […***…]
    - […***…]
- **Total Scope Estimate: […***…]**



9.0 TERMS:

1) *Actual usage shall be invoiced at the end of each SVTC fiscal month for actual activities or engineering hours used, due NET30 days. It is anticipated that actual spend rate will exceed the monthly minimum financial commitment. Minimum financial commitment shall be […***...], with a minimum of […***...]. Any adjustments to fulfill the contracted fee requirements shall be invoiced at the end of every six (6) month duration.*
2) *Product wafers will be ordered under this agreement, and will be invoiced upon shipment, and shall be included in the minimum financial commitment.*
3) *The first and last billing cycle fees and service quantities other than set up shall be prorated to the actual start date and then continue in accordance with SVTC's fiscal calendar such that all invoicing shall follow SVTC fiscal month start and end dates.*

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AMEND462693-005*1*3562676222612785742041677591443084753969004587 1*4*11

1.1 PRODUCT WAFER SPECIFICATIONS:

- **Production Wafer Specifications**
  - **SVTC and BNM agree that at the conclusion of process verification of the Alpha2.0 chip, a robust, in-line test specification will be established to determine "good wafers". It is expected that this specification will include top-down CD, profilometry for depth verification, and visual defect inspect. Actual criteria to be mutually agreed by SVTC and BNM.**
  - **SVTC and BNM agree that at the conclusion of the Alpha3.0 technology development and process verification, a robust, in-line test specification will be established to determine "good wafers". Specification requirements are yet to be determined, and will be mutually agreed by SVTC and BNM.**
  - **It is the intent of SVTC and BNM to integrate the TSV module into the Alpha2.0 flow and eliminate the back-grind process. Once the TSV module is fully developed and the existing Alpha2.0 flow has been released, it is expected that the development required to integrate the two will be minimal. SVTC cannot predict the absolute effort required, as there is currently no data on which to base this conclusion. However, SVTC anticipates at least 2 lots of 6 wafers will be required for validation. SVTC will commit to complete this specific development at pilot production activity pricing, and at the least number of validation lots reasonable to mitigate the cost.**

1.1 SUPPLY CHAIN MANAGEMENT:

- **Supply Chain**
  - Incoming Material: SVTC will by the end of the second quarter of this contract, assume control of incoming supply chain, specifically silicon substrates and glass lid wafers. These materials will be added to monthly invoices with SVTC standard […***…] applied
  - Packaging: SVTC will engage prospective packaging suppliers to develop an integrated solution for BNM. Once a viable technology demonstrator has been produced, SVTC will manage it as part of the integrated supply chain solution with a standard […***…]

556253-1-7-11

AMEND462693-005*1*3562676222612785742041677759144308475396900458 71*7*11

BioNanomatrix
AMEND462693-005
Initials: SVTC: Customer:

12.0 STANDARD ANALYTICAL SERVICES PRICE LIST:

Note: Pricing listed is typical pricing per technique. Actual price will be determined following review of customer specific material and objectives and is subject to change.

SVTC Analytical Services	Price	Unit
[…***…]	[…***…]	Sample
[…***…]	[…***…]	Sample
[…***…]	[…***…]	Each
[…***…]		
[…***…]	[…***…]	Each
[…***…]	[…***…]	Each
[…***…]	Quote	Each
[…***…]	[…***…]	1st Wafer
[…***…]	[…***…]	Additional Wafer
[…***…]		
[…***…]	[…***…]	Each
[…***…]	[…***…]	Each
[…***…]	[…***…]	Each
[…***…]	[…***…]	Each
[…***…]		
[…***…]	[…***…] Lot	
[…***…]	[…***…]	Each
[…***…]	[…***…]	Each
[…***…]	[…***…]	Hour
[…***…]	[…***…]	Hour
[…***…]	[…***…]	Each
[…***…]	[…***…]	Each
[…***…]		
[…***…]	[…***…]	Each
[…***…]	[…***…]	Each
[…***…]	[…***…]	Each
[…***…]	[…***…]	Each
[…***…]	[…***…]	Each

[…***…]
[…***…]

[…***…]	[…***…]	Each
[…***…]	[…***…]	Each
[…***…]	[…***…]	Each
[…***…]	[…***…]	Each
[…***…]	[…***…]	Each
[…***…]	[…***…]	Each
[…***…]	[…***…]	Lot
[…***…]	[…***…]	Each
[…***…]	[…***…]	Lot
[…***…]	[…***…]	Each
[…***…]	[…***…]	Each
[…***…]	[…***…]	Each
[…***…]		
[…***…]		
[…***…]	[…***…]	Each
[…***…]	[…***…]	Each
[…***…]	[…***…]	Each
[…***…]	[…***…]	Each
[…***…]	[…***…]	Each
[…***…]	[…***…]	Each
[…***…]	[…***…]	Each
[…***…]	[…***…]	Each
[…***…]	[…***…]	Lot
[…***…]	[…***…]	Each
[…***…]		
[…***…]	[…***…]	Hour
[…***…]	[…***…]	Hour
[…***…]	[…***…]	Hour
[…***…]	[…***…]	Hour
[…***…]	[…***…]	Hour
[…***…]	[…***…]	Hour
[…***…]	[…***…]	Hour
[…***…]	[…***…]	Hour
[…***…]	[…***…]	Hour
[…***…]	[…***…]	Hour

[…***…]
[…***…]

[…***…]

[…***…]	[…***…]	Each
[…***…]	[…***…]	Each
[…***…]	[…***…]	Each
[…***…]	[…***…]	Hour

556253-1-8-11
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BioNanomatrix
AMEND462693-005
Initials: SVTC: Customer:

[...***...]
[…***…] […***…] Hour

[…***…]			
	[…***…]	[…***…]	Sample
	[…***…]	[…***…]	Sample
	[…***…]	[…***…]	Sample
	[…***…]	[…***…]	Sample
[…***…]			
	[…***…]	[…***…]	Sample
	[…***…]	[…***…]	Sample
	[…***…]	[…***…]	Sample
	[…***…]	[…***…]	Sample
[…***…]		[…***…]	Hour
[…***…]		[…***…]	Sample
[…***…]			
	[…***…]	[…***…]	Hour
	[…***…]	[…***…]	Hour
	[…***…]	[…***…]	Sample
	[…***…]	[…***…]	Sample
	[…***…]	[…***…]	Each
	[…***…]	[…***…]	Sample
	[…***…]	[…***…]	Sample
	[…***…]	[…***…]	Sample
	[…***…]	[…***…]	Each
	[…***…]	[…***…]	Sample
[…***…]			
[…***…]		[…***…]	Each
[…***…]		[…***…]	Each
[…***…]		[…***…]	Each
[…***…]		[…***…]	Each
[…***…]		[…***…]	Each
[…***…]		[…***…]	Each
[…***…]		[…***…]	Each
[…***…]		[…***…]	Each
[…***…]		[…***…]	1st Wafer
[…***…]		[…***…]	Additional Wafer
[…***…]		[…***…]	Sample w/prep
[…***…]		[…***…]	Sample w-out prep

556253-1-9-11

AMEND462693-005*1*35626762226127857420416777591443064753969004587 1*9*11

** Expedite Pricing Options Available for ALL Services Listed**

TERMS AND CONDITIONS FOR ANALYTICAL SERVICES

SVTC, LLC 3901 North First Street, San Jose, CA 95134

1. Except as otherwise agreed in writing by the parties, these Terms and Conditions shall govern analytical services provided to Customer by SVTC. These Terms and Conditions supersede all previous communications, representations, or agreements, either verbal or written, between the parties. The Parties also agree that these Terms and Conditions shall supersede additional, inconsistent or conflicting terms, whether printed or otherwise set forth in any purchase order or other documents provided by Customer to SVTC.

2. Services. SVTC agrees to perform the services described in the proposal/quotation to which these Terms and Conditions are attached. Unless specifically agreed, completion times are not assured. Unless otherwise agreed, SVTC will electronically transmit the results of the analytical services which constitute full performance of SVTC's obligations.

3. Legal. This agreement shall be interpreted under the laws of the State of California. The invalidity or unenforceability, in whole or in part of any provision shall not affect the validity or enforceability of the remainder of the Terms and Conditions. Wavier by SVTC of any provision or of any breach by or obligation of the Customer shall not constitute a waiver of such provision on any other occasion or a waiver of any other breach by or obligation of the Customer. Modifications to this Agreement must be in writing and approved by authorities of the Parties.

4. Methodology. Customer acknowledges that unless otherwise agreed in writing, analytical services may be outsourced to subcontractors of SVTC at SVTC's sole discretion. Industry standard methodologies will normally be used; however, SVTC reserves the right if necessary to deviate from standard methodologies. Customer shall provide a prior written disclosure of known or suspected hazards of toxicity and shall provide written instructions concerning handling. Customer warrants that all submissions will be packaged, labeled, transported and delivered in accordance with applicable laws. Customer will be responsible for disposal.

5. Warranty. SVTC warrants only that it will perform analytical services and prepare reports consistent with current generally accepted analytical laboratory principles and practices. No specific results are guaranteed. Preliminary results may be given in advance of a final report. If provided to Customer, preliminary results are subject to change and final review by SVTC and Customer's use of preliminary results shall be at Customer's risk. SVTC DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED.

6. Liability. Customer's exclusive remedy in the event of a breach of this Agreement shall be that SVTC will repeat the services at its own expense, and SVTC shall have no other liability whatsoever. All claims shall be deemed waived unless made in writing and received by SVTC within sixty (60) days following completion of services. Results are provided only for the use of SVTC Customers. Customer shall indemnify SVTC from any claims by third parties arising out of or related to the services provided under this agreement. IN NO EVENT SHALL SVTC BE LIABLE TO CUSTOMER OR TO ANY THIRD PARTY CLAIMING THROUGH OR UNDER CUSTOMER FOR INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, EVEN IF ADVISED OF THE POSSIBILITY THEREOF IN THE EVENT THAT ANY LIABILITY IS IMPOSED ON SVTC HEREUNDER. AWARDED DAMAGES SHALL NOT EXCEED THE AMOUNT PAID OR PAYABLE BY CUSTOMER TO SVTC FOR THE SERVICE TO WHICH SUCH LIABILITY RELATES. Each party acknowledges that the foregoing limitations are an essential element of the Agreement and that in the absence of such limitations the pricing and other terms set forth in this Agreement would be substantially different.

7. Handling. SVTC shall have no responsibility or liability for the actions of any carrier or for delivery problems to or from SVTC. All shipment arrangements will be at Customer's expense. If not picked up, submissions will be held for a limited time after which they will be destroyed unless otherwise agreed in writing. Disposal of hazardous materials is the responsibility of the Customer. SVTC reserves the right to refuse accept any submission if SVTC determines in its sole discretion, that a submission is of insufficient volume, or that it poses a risk due to health, safety, environmental or other factors, even if not a hazardous substance or notice was made by Customer.

8. Compensation. Services performed will be billed in the amounts quoted or as stated on applicable SVTC Fee Schedules. If Customer notified SVTC to terminate services prior to completion. Customer shall remain liable for all services performed prior to receipt of notice. Payment terms are stated on SVTC's invoice. Unless stated, charges do not include any sales, use or other taxes that will be added to invoice prices if required. SVTC reserves the right to require payment prior to commencing services or release of data. Forensic testimony or other services not stated on the quotation are not included the services to be provided.

9. Intellectual Property. Customer's proprietary data or information submitted by SVTC shall remain the Customer's property. Upon satisfactory payment to SVTC for services provided, data or information generated by SVTC for the Customer shall be deemed the Customer's property. SVTC or its subcontractors shall retain ownership of all analytical methods, protocols, and equipment. Without SVTC's prior written consent, Customer shall not use SVTC's or its subcontractor's names or trademarks in any marketing or reporting materials, press releases or in any other manner and shall not attribute to SVTC any test result tolerance or specification derived from SVTC's data.

556253-1-11-11

AMEND462693-005*1*356267622261278574204167775914430847539690045871*11*11

AMENDMENT 5

This Amendment 5, ("Amendment"), dated September 26, 2011 ("Effective Date") is to the Master Services Agreement dated March 2, 2009 ("Agreement") between SVTC Technologies, LLC ("SVTC"), and BioNanomatrix, Inc. ("Customer"). The Agreement mandates that all changes must be in a writing signed by the parties. Except as provided below, all the provisions of the Agreement shall remain in effect and apply to the amended language. Accordingly, the parties agree to the following:

1) The Agreement is here by amended to include attached Exhibit A5 describing services that will be provided by SVTC for Customer starting on the effective Date. SVTC will provide to Customer the services described in Exhibit A5 for the fees set forth therein, subject to any additional terms and conditions set forth therein. Starting on September 26, 2011, attached Exhibit A5, including the service and fee provisions herein, shall replace and supersede the provisions of prior Exhibit A4 to the Agreement in its entirety.
2) SVTC and Customer also agree to extend the expiration of the Agreement itself from its current expiration date of March 02, 2012, so that the Agreement shall now expire on September 25, 2012 to coincide with the expiration of the Duration in Exhibit A5.

Effect of this Amendment: In the event of any conflict between the Agreement and this Amendment, this Amendment shall control. Except as amended or otherwise set forth in this Amendment, all terms and conditions of the agreement remain in full force and effect and shall apply to this Amendment and the interpretation thereof.

LIST OF ATTACHMENTS: Following is a list of attachments to this Amendment, including all Schedules and Exhibits. Any future added attachment must include a dated Amendment or provisions referencing the Agreement and must be executed by all parties.

Exhibit A5 - Commercial Terms

With due authority from our respective companies, we hereby signify our consent to this Agreement by signing below,

SVTC Technologies, LLC

Signature: /s/ Kevin Kassekert
Printed Name: Kevin Kassekert
Title: General Manager
Date: 9/22/11

Customer; BioNanomatrix, Inc.

Signature: /s/ R. Erik Holmlin
Printed Name: R. Erik Holmlin
Title: CEO
Date: 9/22/2011

Exhibit A5 Commercial Terms
For BioNanomatrix, Inc.'s Fluidics Chip Technology

START DATE: 09-26-2011 DURATION: One (1) Year

SVTC proposes the dale above on which SVTC will begin providing the following services under the Master Services Agreement ("Start Date"). Project Duration is the period of time for the project described in this Amendment.

1.0 DESCRIPTION OF SERVICES:

SVTC shall provide research and development services in support of Customer's Fluidics Chip Technology. SVTC will start with semiconductor processes that exist or are being developed by Customer. and will provide other support as described herein ("Services"). SVTC shall use commercially reasonable efforts to perform the Services requested by BioNanomatrix. Inc., subject to the ability of SVTC to perform these Services on SVTC's existing equipment and using standard materials and process recipes that are compatible with the equipment and resources of SVTC.

1.1 SUMMARY OF SERVICES THAT MAY BE PROVIDED:

- Fab Services
- Engineering Services
- Process Library Licenses

3.0 SVTC SERVICE DEFINITIONS:

Fab Services:

1. […***…]
2. […***…]
3. […***…]
4. […***…]
5. […***…]
6. […***…]

Engineering Services: (Defined in the Agreement)

1. Contracted engineering services may be utilized for the following developmental tasks a. […***…]

b. […***…]
c. […***…]
d. […***…]
e. […***…]
f. […***…]

Library License Fee:
1. […***…]

4.0 ADDITIONAL SERVICES :**

Reticles […***…]
Analytical Services […***…]
** Additional Services subject to availability

5.0 SVTC SERVICE FEE SCHEDULE:

	Development Contract Fees	Frequency	Fees	Frequency
a)	**Fab Services**			
	[…***…]			
	Development Activities unit pricing	[…***…] per activity		
b)	**Engineering Services - Process Engineering Support**			
	• […***…]		[…***…] hourly	
	Engineering Services hours exceeding Included Hours		[…***…] quarterly	
c)	**Library License Fee**			
	• […***…]		[…***…]	
d)	**Analytical Services**			
	• […***…]			
a)	**Reticles**	Quoted upon request		

	[…*…]**	**[…***…]**	**Annual**

1.1 PILOT / LOW VOLUME PRODUCTION:

AMEND462693-006*3*699144388471190871147184900084505397879911909512*1*12

Activity Pricing

Wafers per year

[…*…]**	[…***…]
[…*…]**	[…***…]
[…*…]**	[…***…]

- […***…]
- […***…]

BioNanomatrix
AMEND462693-006
Initials: SVTC: KK Customer:

1.1 TERMS:

1) *Actual usage shall be invoiced* at *the end of each SVTC fiscal month for actual activities or engineering hours used, due NET 30 days. Minimum Financial Commitment (MFC) shall be […***...].*
2) *Product wafers will be ordered under this agreement, and will be invoiced upon shipment, and shall be included in the quarterly minimum financial commitment.*
3) *The first and last billing cycle fees and service quantities other than set up shall be prorated to the actual start date and then continue in accordance with SVTC's fiscal calendar such that all invoicing shall follow SVTC fiscal month start and end dates.*
4) […***…]

10.0 PRODUCT WAFER SPECIFICATIONS:

(BNM refers to BioNanomatrix, Inc.)

Production Wafer Specifications

SVTC and BNM agree that at the collision of process verification of the alpha 2.0 chip, a robust, in-line test specification will be established to determine "good wafers". It is expected that this specification will include top-down CD, profilometry for depth verification, and visual defect inspect. Actual criteria to be mutually agreed by SVTC and BNM.

SVTC and BNM agree that at the conclusion of the Alpha 3.0 technology development and process verification, a robust, in-line test specification will be established to determine "good wafers". Specification requirements are yet to be determined, and will be mutually agreed by SVTC and BNM.

It is the intention of SVTC and BNM to integrate the TSV module into the Alpha 2.0 flow and eliminate the back-grind process. Once the TSV module is fully developed and the existing Alpha 2.0 flow has been released, it is expected that the development required to integrate the two will be minimal. SVTC cannot predict the absolute the absolute effort required, as there is currently no data on which to base this conclusion. However, SVTC anticipates at least 2 lots of 6 wafers will be required for validation. SVTC will commit to complete this specific development at pilot production activity pricing, and the least number of validation lots reasonable to mitigate the cost.

1.1 STANDARD ANALYTICAL SERVICES PRICE LIST:

Note: Pricing listed is typical pricing per technique. Actual price will be determined following review of customer specific material and objectives and is subject to change.

SVTC Analytical Services	Price	Unit
[…***…]	[…***…]	Sample
[…***…]	[…***…]	Sample
[…***…]	[…***…]	Each
[…***…]		
[…***…]	[…***…]	Each
[…***…]	[…***…]	Each
[…***…]	[…***…]	Each
[…***…]	[…***…]	1st Wafer
[…***…]	[…***…]	Additional Wafer
[…***…]		
[…***…]	[…***…]	Each
[…***…]	[…***…]	Each
[…***…]	[…***…]	Each
[…***…]	[…***…]	Each
[…***…]		
[…***…]	[…***…]	
[…***…]	[…***…]	Each
[…***…]	[…***…]	Each
[…***…]	[…***…]	Hour
[…***…]	[…***…]	Hour
[…***…]	[…***…]	Each
[…***…]	[…***…]	Each
[…***…]		
[…***…]	[…***…]	Each
[…***…]	[…***…]	Each
[…***…]	[…***…]	Each
[…***…]	[…***…]	Each
[…***…]	[…***…]	Each

BioNanomatrix
AMEND462693-006
Initials: SVTC: KK Customer:

[…***…]			
[…***…]			
[…***…]	[…***…]	[…***…]	Each
[…***…]	[…***…]	[…***…]	Each
[…***…]	[…***…]	[…***…]	Each
[…***…]	[…***…]	[…***…]	Each
[…***…]	[…***…]	[…***…]	Each
[…***…]	[…***…]	[…***…]	Each
[…***…]	[…***…]	[…***…]	Lot
[…***…]	[…***…]	[…***…]	Each
[…***…]	[…***…]	[…***…]	Lot
[…***…]	[…***…]	[…***…]	Each
[…***…]	[…***…]	[…***…]	Each
[…***…]	[…***…]	[…***…]	Each
[…***…]			
[…***…]			
[…***…]	[…***…]	[…***…]	Each
[…***…]	[…***…]	[…***…]	Each
[…***…]	[…***…]	[…***…]	Each
[…***…]	[…***…]	[…***…]	Each
[…***…]	[…***…]	[…***…]	Each
[…***…]	[…***…]	[…***…]	Each
[…***…]	[…***…]	[…***…]	Each
[…***…]	[…***…]	[…***…]	Each
[…***…]	[…***…]	[…***…]	Lot
[…***…]		[…***…]	Each
[…***…]			
[…***…]	[…***…]	[…***…]	Hour
[…***…]	[…***…]	[…***…]	Hour
[…***…]		[…***…]	Hour
[…***…]			
[…***…]	[…***…]	[…***…]	Hour
[…***…]	[…***…]	[…***…]	Hour
[…***…]	[…***…]	[…***…]	Hour
[…***…]		[…***…]	Hour
[…***…]		[…***…]	Hour
[…***…]		[…***…]	Hour
[…***…]		[…***…]	Hour
[…***…]			
[…***…]	[…***…]	[…***…]	Each
[…***…]	[…***…]	[…***…]	Each
[…***…]	[…***…]	[…***…]	Each
[…***…]		[…***…]	Hour

[…***…]
[…***…] […***…] Hour

[…***…]
[…***…] […***…] Sample
[…***…] […***…] Sample
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[…***…] […***…] Hour
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[…***…] […***…] Hour
[…***…] […***…] Hour
[…***…] […***…] Sample
[…***…] […***…] Sample
[…***…] […***…] Each
[…***…] […***…] Sample
[…***…] […***…] Sample
[…***…] […***…] Sample
[…***…] […***…] Each
[…***…] […***…] Sample
[…***…] […***…] Each
[…***…] […***…] Each
[…***…] […***…] Each
[…***…] […***…] Each
[…***…] […***…] Each
[…***…] […***…] Each
[…***…] […***…] Each
[…***…] […***…] Each
[…***…] […***…] Each
[…***…] […***…] 1st Wafer
Additional
[…***…] Wafer
[…***…] […***…] Sample w/prep
Sample w-out prep
[…***…]

** Expedite Pricing Options Available for ALL Services Listed**

AMENDMENT 6

This Amendment 6, ("Amendment"), dated September 26, 2011 ("Effective Date") is to the Master Services Agreement dated March 2, 2009 ("Agreement") between SVTC Technologies, LLC ("SVTC"), and BioNanomatrix, Inc. ("Customer"). The Agreement mandates that all changes must be in a writing signed by the parties. Except as provided below, all the provisions of the Agreement shall remain in effect and apply to the amended language. Accordingly, the parties agree to the following:

The Agreement is hereby amended to include attached Exhibit C1, Insurance Requirements for SVTC Customers. Starting on September 26, 2011, attached Exhibit C1, including the insurance requirements therein, shall replace and supersede the provisions of prior Exhibit C to the Agreement in its entirety.

Effect of this Amendment: In the event of any conflict between the Agreement and this Amendment, this Amendment shall control. Except as amended or otherwise set forth in this Amendment, all terms and conditions of the agreement remain in full force and effect and shall apply to this Amendment and the interpretation thereof.

LIST OF ATTACHMENTS: Following is a list of attachments to this Amendment, including all Schedules and Exhibits. Any future added attachment must include a dated Amendment or provision referencing the Agreement and must be executed by all parties.

Exhibit C1 – Insurance Requirements for SVTC Customers

With due authority from our respective companies, we hereby signify our consent to this Agreement by signing below.

SVTC Technologies, LLC

Signature: /s/ Kevin Kassekert
Printed Name: Kevin Kassekert
Title: General Manager
Date: 9/23/11

Customer; BioNanomatrix, Inc.

Signature: /s/ Lorraine LoPresti
Printed Name: Lorraine LoPresti
Title: CFO
Date: 9/23/2011

Exhibit C1 Insurance Requirements

BioNanomatrix September 26, 2011

Insurance Requirements for SVTC Customers

Within the timeframe specified in the Agreement stating insurance requirements or when requested by SVTC, Customer must provide Certificates of insurance verifying it has the following types of insurance (including an attachment specifying additional or named insureds and any waiver endorsements). If the Agreement requires limits other than those below, the limits stated in the Agreement shall supersede those below. Customer agrees to maintain all such applicable insurance during its operations at SVTC.

Note that the following insurance requirements apply only to Customers working on SVTC premises using SVTC equipment. If there will be no use of SVTC equipment, the below insurance requirements do not apply. If the nature of Customer's work on STC premises changes during the term of the Agreement, the insurance requirement below may be imposed, waived or re-imposed. By way of example, if a customer desires access to the fabs but does not actually use the equipment, a lesser value of insurance may be acceptable, subject to the level being increased if the customer later starts directly using SVTC equipment.

Commercial General Liability Coverage: Policy must name SVTC, Technologies LLC., ("SVTC"), as an additional insured and include a waiver of subrogation in favor of SVTC; include Broad Form Property Damage, Blanket Contractual Liability (covering liability assumed by Supplier), Premises/Operations, and products/Completed Operations.

$ […***…] General Aggregate
$ […***…] Products-Completed Operations Aggregate (as needed)
$ […***…] Personal 7 Advertising Injury
$ […***…] Each Occurrence
$ […***…] Fire Damage (Any one fire)
$ […***…] Medical Expense (any one person)

Excess/Umbrella Coverage: This policy must be in force in addition to the underlying coverage required above without any gaps and subject to all of the same requirements as the underlying coverage so that the total amount of insurance coverage (underlying plus umbrella) equals the following:

$ […***…] Each occurrence and general aggregate

SVTC and BioNanomatrix agree that under no circumstances will BioNanomatrix personnel enter SVTC's facilities unescorted, nor will Bionanomatrix personnel operate SVTC equipment.

AMENDMENT 7

This Amendment 7, ("Amendment"), dated March 26, 2012 ("Effective Date") is to the Master Services Agreement dated March 2, 2009, as amended, (collectively, the "Agreement") between SVTC Technologies, LLC ("SVTC"), and BioNanomatrix, now known as BioNano Genomics, ("Customer"). The Agreement mandates that all changes must be in a writing signed by the parties. Except as provided below, all the provisions of the Agreement shall remain in effect and apply to the amended language. Accordingly, the parties agree to the following:

1) The Agreement is hereby amended to include attached Exhibit A7 describing services that will be provided by SVTC for Customer starting on the Effective Date. SVTC will provide to Customer the services described in Exhibit A7 for the fees set forth therein, subject to any additional terms and conditions set forth therein. Starting on March 26, 2012, attached Exhibit A7, including the service and fee provisions therein, shall replace and supersede the provisions of prior Exhibit A5 to the Agreement in its entirety.
2) SVTC and Customer also agree to amend the Agreement to include attached Exhibit D.
3) SVTC and Customer also hereby agree to extend the expiration of the Agreement from its current expiration date of September 25, 2012, to March 24, 2013.

Effect of this Amendment. IN THE EVENT OF ANY CONFLICT BETWEEN THE AGREEMENT AND THIS AMENDMENT, THIS AMENDMENT SHALL CONTROL. Except as amended or otherwise set forth in this Amendment, all terms and conditions of the Agreement remain in full force and effect and shall apply to this Amendment and the interpretation thereof.

LIST OF ATTACHMENTS: Following is a list of attachments to this Amendment, including all Schedules and Exhibits. Any future added attachment must include a dated Amendment or provision referencing the Agreement and must be executed by all parties.

Exhibit A7 - Commercial Terms

Exhibit D — Process Controls and Metrics

With due authority from our respective companies, we hereby signify our consent to this Agreement by signing below,

SVTC Technologies, LLC

Signature: _____

Printed Name: Kevin Kassekert
Title: Vice President, Silicon Services Date: _____

Customer: BioNano Genomics
Signature: /s/ Erik Holmlin
Printed Name: Erik Holmlin
Title: CEO
Date: May 3, 2012

Exhibit A7 Commercial Terms
For BioNano Genomics's […*…] Validation Phase**

START DATE: 03-26-2012 **DURATION:** Twelve (12) Fiscal Months

SVTC proposes the date above on which SVTC will begin providing the following services under the Master Services Agreement ("Start Date"). Project Duration is the period of time for the project described in this Amendment.

1.0 DESCRIPTION OF SERVICES:

SVTC shall provide research and development services in support of Customer's […***…]. SVTC will start with […***…], as well as other support as described herein ("Services"). SVTC shall use commercially reasonable efforts to perform the Services requested by Customer, subject to the ability of SVTC to perform these Services on SVTC's existing equipment and using standard materials and process recipes that are compatible with the equipment and resources of SVTC.

1.2 SUMMARY OF SERVICES THAT MAY BE PROVIDED:

- […***…]
- […***…]
- […***…]

3.0 SVTC SERVICE DEFINITIONS Fab Services:

1. […***…]
2. […***…]
3. […***…]
4. […***…]
5. […***…]
6. […***…]

Engineering Services: (Defined in the Agreement)

1. Contracted engineering services may be utilized for the following development tasks a. […***…]
   b. […***…]
   c. […***…]
   d. […***…]
   e. […***…]
   f. […***…]
2. These services are to be executed in collaboration with customers direction and management

Library License Fee:

1. Library access, use, and license is limited to recipes available on the SVTC equipment list (MSA Exhibit B) at the time of contract closure.

4.0 ADDITIONAL SERVICES*:

Reticles […***…]
Analytical Services […***…]

** Additional Services subject to availability

BioNano Genomics
AMEND462693-008
Initials: SVTC:_____ Customer:

1.1 SERVICE FEE SCHEDULE: ONGOING DEVELOPMENT: […*…] OPTIMIZATION & NEXT GEN PRODUCT**

Item	Fees	Frequency
a) Tier 1 Pricing		
• […***…]	[…***…]	[…***…]
Engineering Services - Process	[…***…]	[…***…]
Analytical	[…***…]	[…***…]
Tier 1 Minimum Financial Commitment		[…***
b Tier 2 Pricing (Baseline		
Engineering Services - Process	[…***…]	[…***…]
Analytical	[…***…]	[…***…]
Tier 2 Minimum Financial Commitment		[…***
• […***…] – […***…]	[…***…]	[…***…]
c Tier 3		
– […***…]	[…***…]	[…***…]
Engineering Services - Process Engineering Support	[…***…]	[…***…]
Analytical Services	[…***…]	[…***…]
Tier 3 Minimum Financial Commitment	[…***…]	[…***…]
d) Hot Lot Fee	[…***…]	[…***…]
e) Baseline Minimum Financial Commitment (Tier 2 Above)	[…***…]	[…***…]

1.1 SERVICE FEE SCHEDULE: […*…] CHARACTERIZATION & VALIDATION - DURATION – 9 FISCAL MONTHS**

Phase	**Deliverables: Turnkey Project**	**Total**
1.2 Phase 1	**Complete Process Characterization for Validation**	**[…***…]**
	[…***…] […***…] […***…] […***…] […***…] […***…]	
	Milestones:	
	[…***…]	[…***…]
	[…***…]	[…***…]
	[…***…]	[…***…]
	[…***…]	[…***…]
	[…***…]	[…***…]
	[…***…]	[…***…]
	[…***…]	[…***…]
	[…***…]	[…***…]

Phase	Deliverables: Turnkey Project	Total
6.2 Phase 2	**Validate Process for Specialty Production**	**[…***…]**

[…*…] […***…]** […***…]

Milestones:

[…***…]	[…***…]
[…***…]	[…***…]
[…***…]	[…***…]
[…***…]	[…***…]
[…***…]	[…***…]
[…***…]	[…***…]
[…***…]	[…***…]
[…***…]	[…***…]
[…***…]	[…***…]
[…***…]	[…***…]
[…***…]	[…***…]

Change in the scope of work: If Customer, during the course of the project execution, materially changes the scope of work such that the SVTC's engineering resources are increased or if the costs to SVTC increase to perform the work as per the changes, Customer will be notified in order to reconvene to re-negotiate the agreement. In case the parties do not agree regarding the changes, Customer is responsible for the payments according to the Early Termination clause, below.

7.0 TERMS:

1) *Section 5.0 (above) Actual usage shall be invoiced at the end of each SVTC fiscal month for actual services provided, due NET30 days. At the end of SVTC's fiscal year, […***…].*
2) *Customer must provide SVTC with advanced written notice of its election of the pricing tier, section 5 above, twice a year, at least […***…] prior to the start of the first and third SVTC fiscal quarters. If no written notice is received […***…] prior to the beginning of any quarter, the pricing tier […***…]. In the event […***…] is selected by Customer, the price structure for that tier will be applied to […***…]. In the event a […***…].*
3) *These commercial terms may be terminated with 90 days prior written notice of project termination.*
4) *Product/sample wafers will be ordered under this agreement, and will be invoiced upon shipment, and shall be included in the quarterly financial commitment.*
5) *The first and last billing cycle fees and service quantities other than set up shall be prorated to the actual start date and then continue in accordance with SVTC's fiscal calendar such that all invoicing shall follow SVTC fiscal month start and end dates.*
6) *Section 6.0 (above): SVTC shall invoice Customer upon completion of each milestone as defined in sub-sections 6.1 and 6.2 above, and payment shall be due 30 days from date of invoice.*
7) *Upon execution, this proposal will supersede the existing agreement between Customer and SVTC, and that agreement (AMEND462693-006) will become null and void with no penalty to Customer.*
8) *The parties agree that the final outcome of the […***…] cannot be known at the time of this agreement. Therefore it is agreed that in the event […***…], then the parties will agree to convene and decide on next steps. In such case, BioNano Genomics would be under no obligation to […***…]. In the event that […***…], then […***…] will be the responsibility of SVTC.*

8.0 LICENSED TECHNOLOGY:

The Services listed above and SVTC's process technology, including recipes and steps, used in the performance of services shall be provided and licensed to Customer under the terms, conditions and limitations of the Master Services Agreement, which shall override and supersede any terms and conditions in any customer provided documents.

AMEND462693-007*1*3655745199128439050260404021580712827810409151450*2*2

1.1 ASSUMPTIONS, RISKS & MITIGATIONS:

Cornerstone Assumptions

[…***…] process flow as developed will not require major changes in process integration. […***…] will provide hardware for new wetting quality checks.

AMEND462693-007*1*365574519912843906026404021580712827810409151450*2*2

BioNano Genomics
AMEND462693-008
Initials: SVTC:_____ Customer:

Risk Mitigation Plan

Risks

[...***...]	[...***...]
[...***...]	[...***...]
[...***...]	[...***...]
[...***...]	[...***...]
[...***...]	[...***...]
[...***...]	[...***...]

AMEND462693-Q07*1*365574519912843905026404021580712827810409151450*2*2

BioNano Genomics
AMEND462693-008
Initials: SVTC:_____ Customer:

Exhibit D

Process Controls and Metrics To be defined at a future date

AMENDMENT 8

This Amendment 8, ("Amendment"), dated October 29, 2012 ("Effective Date") is to the Master Services Agreement dated March 2, 2009 ("Agreement") between Novati Technologies, Inc. ("Novati"), and BioNano Genomics ("Customer"). The Agreement mandates that all changes must be in a writing signed by the parties. Except as provided below, all the provisions of the Agreement shall remain in effect and apply to the amended language. Accordingly, the parties agree to the following:

1) The parties acknowledge the successful assignment of the Agreement by SVTC Technologies, LLC to Novati Technologies, Inc. ("Novati") effective as of October 15, 2012.
2) The parties agree to amend the Agreement describing services that Novati will perform for Customer starting on the Effective Date.
3) Starting on October 19, 2012 and ending on December 31, 2012, Novati will continue the ongoing Development of the […***…]. Accordingly, the parties agree to use the Tier 2 pricing in Section 5 of Exhibit A7. The proposed estimated volume is […***…] over this time period.
4) Customer agrees to prepay the charges for the activities and engineering hours in item 2) above, for a total amount of […***…] which is the estimated November and December spend. Novati shall invoice the November prepayment of […***…] upon execution of this Amendment, and Customer agrees to pay on or before November 16, 2012. Furthermore, Customer agrees to prepay […***…] on or before December 1, 2012 which is the estimated spend for December.
5) The Wafer minimum Lot size for all activities under this agreement shall be 6.
6) Any pre-paid funds which are unutilized as of December 31, 2012 shall be carried forward as a credit balance. Any activities, engineering hour charges, or other billable services in excess of the pre-paid amount shall be reconciled and billed as of December 31, 2012 at the unit cost consistent with that specified in 3) above and are due Net 30.
7) The parties may extend the term of the Agreement by mutual agreement in writing on a quarterly basis.
8) Novati's address for notices, set forth in section 12.8 of the Agreement is hereby replaced with: 2706 Montopolis Drive, Austin, TX 78741, ATTN: Legal Department.

Effect of this Amendment: In the event of any conflict between the Agreement and this Amendment, this Amendment shall control. Except as amended or as otherwise set forth in this Amendment, the Agreement shall continue unchanged and in full force and effect in accordance with its terms.

{***AMEND462693-008*1*522558879341273387043830578381211095845623583893*10*10***}

With due authority from our respective companies, we hereby signify our consent to this Agreement by signing below,

Novati Technologies, Inc.

Signature: _____

Printed Name: David B. Anderson
Title: CEO
Date: _____

Customer: **BioNano Genomics**

Signature: /s/ Erik Holmlin
Printed Name: Erik Holmlin
Title: Chief Executive Officer
Date: 11/14/12

["AMEND462693-009"1"26291085149341830373076647195499576473806927692 6"2"2""]

NOVATI TECHNOLOGIES, INC

BioNano Genomics
AMEND462693-010
Initials: Novati Customer:

AMENDMENT 9

This Amendment 9, ("Amendment"), dated December 31, 2012 ("Effective Date") is to the Master Services Agreement dated March 2, 2009 ("Agreement") between Novati Technologies, Inc. ("Novati"), and BioNano Genomics ("Customer"). Novati is the legal successor in interest to SVTC Technologies, LLC on the Agreement. The Agreement mandates that all changes must be in a writing signed by the parties. Except as provided below, all the provisions of the Agreement shall remain in effect and apply to the amended language.
Accordingly, the parties agree to the following:

1) The parties agree to amend the Agreement to describe services that will be provided by Novati for Customer on the effective date. Novati will continue to provide to Customer the services described in Amendment 7 for the fees set forth therein using the Tier 2 pricing in Section 5.0, subject to any additional terms and conditions set forth therein.
2) The parties hereby agree to amend paragraph 3 of Amendment 7 to revise the expiration date from March 24, 2013 to March 31, 2013 to align with the Novati fiscal quarter.
3) The parties agree to delete in its entirety Section 6.2 – Phase 2, described in Amendment 7.
4) The parties agree that section 12.1 of the Agreement is hereby amended to state that the laws of the State of Texas, without regard to the conflict of laws provisions, shall govern this Agreement.

Effect of this Amendment: In the, event of any conflict between the Agreement and this Amendment, this Amendment shall control. Except as amended or as otherwise set forth in this Amendment, the Agreement shall continue unchanged and in full force and effect in accordance with its terms.

With due authority from our respective companies, we hereby signify our consent to this Agreement by signing below,

Novati Technologies, Inc.

Signature: /s/ David B. Anderson
Printed Name: David B. Anderson
Title: Chief Executive Officer
Date: 1-31-13

Customer: BioNano Genomics

Signature: /s/ Erik Holmlin
Printed Name: Erik Holmlin
Title: Chief Executive Officer
Date: Jan 30, 2013

["AMEND462693-009"1"26291085149341830373076647195499576473806927692 6"2"2""]

NOVATI TECHNOLOGIES, INC

BioNano Genomics
AMEND462693-010
Initials: Novati: Customer:

AMENDMENT 10

This Amendment 10, ("Amendment"), dated April 1, 2013 ("Effective Date") is to the Master Services Agreement dated March 2, 2009 ("Agreement") between Novati Technologies, Inc. ("Novati"), and BioNano Genomics ("Customer"). The Agreement mandates that all changes must be in a writing signed by the parties. Except as provided below, all the provisions of the Agreement shall remain in effect and apply to the amended language. Accordingly, the parties agree to the following:

1) The parties agree to amend the Agreement describing services that will be provided by Novati for Customer starting on the Effective Date. Novati will provide to Customer the services described in Exhibit A10 for the fees set forth therein subject to any additional terms and conditions set forth therein.

Effect of this Amendment: In the event of any conflict between the Agreement and this Amendment, this Amendment shall control. Except as amended or as otherwise set forth in this Amendment, the Agreement shall continue unchanged and in full force and effect in accordance with its terms.

LIST OF ATTACHMENTS: Following is a list of attachments to this Amendment, including all Schedules and Exhibits. Any future added attachment must include a dated Amendment or provision referencing the Agreement and must be executed by all parties.

Exhibit

With due authority from our respective companies, we hereby signify our consent to this Agreement by signing below,

Novati Technologies, Inc.

Signature: /s/ David B. Anderson

Printed Name: David B. Anderson
Title: President and CEO
Date: March 18, 2013

Customer: BioNano Genomics

Signature: /s/ Erik Holmlin

Printed Name: Erik Holmlin
Title: Chief Executive Officer
Date: March 15, 2013

[***AMEND462693-011*2*550619168865826308795323706867240751779597722463*1*5***]

NOVATI TECHNOLOGIES, INC.

BioNano Genomics
AMEND462693-011
Initials: Novati: Customer:

Exhibit A Commercial Quotation
For BioNano Genomics's Alpha Chip Continued Development - Q2'13 - Q1'14

START DATE: 04-01-20139 **DURATION:** Four Fiscal (4) Quarters

Novati proposes the date above on which Novati will begin providing the following services under the Master Services Agreement ("Start Date"). Project Duration is the period of time for the project described in this Quotation.

1.0 DESCRIPTION OF SERVICES:

Novati shall provide research and development services in support of BioNano Genomics's Alpha Chip Continued Development Q2'13 - Q1'14. Novati will start with semiconductor processes that exist or are being developed by BioNano Genomics, and will provide other support as described herein ("Services"). Novati shall use commercially reasonable efforts to perform the Services requested by BioNano Genomics, subject to the ability of Novati to perform these Services on Novati's existing equipment and using standard materials and process recipes that are compatible with the equipment and resources of Novati.

1.3 SUMMARY OF SERVICES THAT MAY BE PROVIDED:

- Fab Services
- Engineering Services

3.0 NOVATI SERVICE DEFINITIONS:

Fab Services:

1. […***…]
2. […***…]
3. […***…]
4. […***…]
5. […***…]
6. […***…]
7. […***…]

["***AMEND462693-011*2*5506191688658263087953237098672407917759772463*2*5***]

Engineering Services: (Defined in the Agreement)

1. […***…]
2. These services are to be executed in collaboration with customers direction and management

4.0 ADDITIONAL SERVICES:**

Additional Training Services […***…]

["***AMEND462693-011*2*5506191688658263087953237098672407917759772246 3*2*5***]

NOVATI TECHNOLOGIES, INC.

BioNano Genomics
AMEND462693-011
Initials: Novati: Customer:

Additional Cubicles & Lockable Office Space	[…***…]

Reticles […***…]
Analytical Services […***…]

** Additional Services subject to availability

[***AMEND462693-011*2*5506191688658203087953237058672407917705977224 63*2*5***]

5.0 NOVATI SERVICE FEE SCHEDULE:

	Item	Fees	Frequency
a)	**Tier 1 Pricing**	[…***…]	Per activity
	[…*…]**	[…***…]	per hour
	[…*…]**	per standard price list	
	Tier 1 Minimum Financial Commitment	[…***…]	Quarterly
b)	**Tier 2 Pricing (Baseline Minimum Financial Commitment)**	[…***…]	Per activity
	[…*…]**	[…***…]	per hour
	[…*…]**	per standard price list	
	Tier 2 Minimum Financial Commitment	[…***…]	Quarterly
c)	**Tier 3 Pricing**	[…***…]	Per activity
	[…*…]**	[…***…]	per hour
	[…*…]**	per standard price list	
	Tier 3 Minimum Financial Commitment	[…***…]	Quarterly
d)	**Tier 4 Pricing**	[…***…]	Per activity
	[…*…]**	[…***…]	per hour
	[…*…]**	per standard price list	
	Tier 4 Minimum Financial Commitment	[…***…]	Quarterly
e)	**Hot Lot Fee**	[…***…]	Per request
f)	**Baseline Minimum Financial Commitment (Tier 2 above)**	**[…***…] Quarterly**	

["**AMEND462693-011*2*5506191688658263087953237058672407917759772463*2*5**]

NOVATI TECHNOLOGIES, INC.

BioNano Genomics
AMEND462693-011
Initials: Novati: Customer:

6.0 TERMS:

1) *The Minimum Financial Commitment (MFG) for Fab Services and Engineering Services shall be per the selected Tier in Section 5. At the signing of contract, the Minimum Financial Commitment will be set at the Tier 2 Baseline. Novati will invoice Customer [… ***…] 15 days prior to the start of the fiscal quarter and each subsequent fiscal month thereafter. All prepayments are due immediately upon receipt of invoice. Actual usage shall be invoiced at the end of each Novati fiscal month for actual services provided and is due within 30 days from date of invoice. At the end of Novati's fiscal quarter, the actual usage will be 'trued-up" against the designated MFC tier, and any under usage shall be invoiced and is due within 30 days from date of invoice. Other than the foregoing, Novati shall invoice Customer when services are rendered, products shipped and/or deliverables are provided in the Novati fiscal month that they occur. Payments shall be due within 30 days from date of Invoice.*
2) *Customer may change the election of the pricing tier on a quarterly basis by providing 20 days advanced written notice prior to each Novati fiscal quarter. If no written notice is received 20 days prior to the beginning of any quarter, the pricing tier will automatically be set to Tier 2.*
3) *The first and last billing cycle fees and service quantities other than set up shall be prorated to the actual start date and then continue in accordance with Novati's fiscal calendar such that all invoicing shall follow Novati fiscal month start and end dates.*
4) *Additional Activities, Engineering Hours, Additional Tool Training, access to additional equipment and resources, and other Extraordinary Expenses ("Additional Services") shall be made available at Novati's sole discretion and shall be agreed to in writing prior to being performed by Novati BioNano Genomics shall pay for all Additional Services per the terms of the Master Services Agreement.*

1.1 LICENSED TECHNOLOGY:

The Services listed above and Novati's process technology, including recipes and steps, used in the performance of services shall be provided and licensed to Customer under the terms, conditions and limitations of the Master Services Agreement, which shall override and supersede any terms and conditions in any customer provided documents.

[***AMEND462693-011*2*5506191688658263087953237058672407917759772463*2*5***]

NOVATI TECHNOLOGIES, INC.

BioNano Genomics
AMEND462693-011
Initials: Novati: Customer:

AMENDMENT 11

This Amendment 11, ("Amendment"), dated April 29, 2013 ("Effective Date") is to the Master Services Agreement dated March 2, 2009 ("Agreement") between Novati Technologies, Inc. ("Novati"), and BioNano Genomics ("Customer"). The Agreement mandates that all changes must be in a writing signed by the parties. Except as provided below, all the provisions of the Agreement shall remain in effect and apply to the amended language. Accordingly, the parties agree to the following:

1) The parties agree to amend the Agreement describing services that will be provided by Novati for Customer starting on the Effective Date. Novati will provide to Customer the services described for the fees set forth therein subject to any additional terms and conditions set forth therein.
2) The following activity has occurred against Amendment 10 to date: Novati invoiced Customer the April prepayment against invoice 616 on 3/18/13 for […***…] and has been paid by Customer. Novati invoiced Customer the May prepayment against invoice 800 on 4/15/13 for […***…]. Novati agrees to credit Customer for the invoice amount.
3) Starting on April 29, 2013 Section 6, item 1 in Amendment 10 shall be replaced and superseded in its entirety with the following.
4) The Minimum Financial Commitment (MFC) for Fab Services and Engineering Services shall be per the selected Tier in Section 5. At the signing of contract, the Minimum Financial Commitment will be set at the Tier 2 Baseline. Novati will invoice Customer actual usage bi-weekly for actual services provided and will be due immediately upon receipt of invoice. At the end of Novati's fiscal quarter, the actual usage will be "trued-up" against the designated MFC tier, and any under usage shall be invoiced and is due immediately upon receipt of invoice. Other than the foregoing, Novati shall invoice Customer when services are rendered, products shipped and/or deliverables are provided in the Novati fiscal month that they occur. Payments shall be due Net 0 from date of invoice.

Effect of this Amendment: In the event of any conflict between the Agreement and this Amendment, this Amendment shall control. Except as amended or as otherwise set forth in this Amendment, the Agreement shall continue unchanged and in full force and effect in accordance with its terms.

LIST OF ATTACHMENTS: Following is a list of attachments to this Amendment, including all Schedules and Exhibits. Any future added attachment must include a dated Amendment or provision referencing the Agreement and must be executed by all parties.

["**AMEND462693-011*2*5506191688658263087953237058672407917759772246 3*2*5***]

With due authority from our respective companies, we hereby signify our consent to this Agreement by signing below,

Novati Technologies, Inc.

Signature: /s/ David B. Anderson

Printed Name: David B. Anderson
Title: President and CEO
Date: April 24, 2013

Customer: BioNano Genomics

Signature: /s/ R. Erik Holmlin

Printed Name: R. Erik Holmlin
Title: President CEO
Date: 24-Apr-2013

[***AMEND462693-012*2*0826942249496201526602110702747021190908335033 1*2*2***]

NOVATI TECHNOLOGIES, INC.

BioNano Genomics
AMEND462693-013
Initials: Novati: Customer:_____ AMENDMENT 12

This Amendment 12, ("Amendment"), dated December 15, 2013 ("Effective Date") is to the Master Services Agreement dated March 2, 2009 ("Agreement") between Novati Technologies, Inc. ("Novati"), and BioNano Genomics ("Customer"). The Agreement mandates that all changes must be in a writing signed by the parties. Except as provided below, all the provisions of the Agreement shall remain in effect and apply to the amended language. Accordingly, the parties agree to the following:

1) The parties agree to amend the Agreement describing services that will be provided by Novati for Customer starting on the Effective date. Novati will provide to Customer the services described for the fees set forth therein subject to any additional terms and conditions set forth therein.
2) Starting on December 15th, 2013 Section 4 in Amendment 11 shall be replaced and superseded in its entirety with the original language stated Section 6.0, paragraph (1) in Amendment 10 to reinstate the prepayment provisions for Q1 2014.

Effect of this Amendment: In the event of any conflict between the Agreement and this Amendment, this Amendment shall control. Except as amended or as otherwise set forth in this Amendment, the Agreement shall continue unchanged and in full force and effect in accordance with its terms.

With due authority from our respective companies, we hereby signify our consent to this Agreement by signing below,

Novati Technologies, Inc.

Signature: /s/ David B. Anderson

Printed Name: David B. Anderson
Title: President and CEO
Date: DEC 17, 2013

Customer: BioNano Genomics

Signature: /s/ Lynne R. Rollins

Printed Name: Lynne R. Rollins
Title: CFO
Date: Dec 16 2013

[***AMEND462693-012*2*0826942249496201526602110702747021190908335033 1*2*2***]

NOVATI TECHNOLOGIES, INC.

BioNano Genomics
AMEND462693-013
Initials: Novati: Customer:_____ AMENDMENT 13

This Amendment 13, ("Amendment"), dated March 7, 2014 ("Effective Date") is to the Master Services Agreement dated March 2, 2009 ("Agreement") between Novati Technologies, Inc. ("Novati"), and BioNano Genomics ("Customer"). The Agreement mandates that all changes must be in a writing signed by the parties. Except as provided below, all the provisions of the Agreement shall remain in effect and apply to the amended language. Accordingly, the parties agree to the following:

1) Both parties agree to extend the expiration date of the Agreement from April 1, 2014 to March 31, 2015.
2) Effective April 1, 2014 item 4 in Amendment 11 shall be replaced and superseded with the following paragraph which was originally set forth in Section 6, item 1 in Amendment 10:

The Minimum Financial Commitment (MFC) for Fab Services and Engineering Services shall be per the selected Tier in Section 5. At the signing of contract, the Minimum Financial Commitment will be set at the Tier 2 Baseline. Novati will invoice Customer 1/3 of the quarterly commitment 15 days prior to the start of the fiscal quarter and each subsequent fiscal month thereafter. All prepayments are due immediately upon receipt of invoice. Actual usage shall be invoiced at the end of each Novati fiscal month for actual services provided and is due within 30 days from date of invoice. At the end of Novati's fiscal quarter, the actual usage will be "trued-up" against the designated MFC tier, and any under usage shall be invoiced and is due within 30 days from date of invoice. Other than the foregoing, Novati shall invoice Customer when services are rendered, products shipped and/or deliverables are provided in the Novati fiscal month that they occur. Payments shall be due within 30 days from date of invoice.

Effect of this Amendment: In the event of any conflict between the Agreement and this Amendment, this Amendment shall control. Except as amended or as otherwise set forth in this Amendment, the Agreement shall continue unchanged and in full force and effect in accordance with its terms.

LIST OF ATTACHMENTS: Following is a list of attachments to this Amendment, including all Schedules and Exhibits. Any future added attachment must include a dated Amendment or provision referencing the Agreement and must be executed by all parties.

["*AMEND462693-014*7*01680155544576900917012914144103793349016203000 2*1*2**]

NOVATI TECHNOLOGIES, INC.

BioNano Genomics
AMEND462693-014
Initials: Novati Customer:

With due authority from our respective companies, we hereby signify our consent to this Agreement by signing below,

Novati Technologies, Inc.

Signature: /s/ David B. Anderson

Printed Name: David B. Anderson
Title: President and CEO
Date: 3/13/2014

Customer: BioNano Genomics

Signature: /s/ Erik Holmlin

Printed Name: Erik Holmlin
Title: CEO
Date: 3/13/14

["*AMEND462693-014*7*01680155544576900917012914144103793349016203000 2*1*2**]

NOVATI TECHNOLOGIES, INC.

BioNano Genomics
AMEND462693-014
Initials: Novati Customer:

AMENDMENT 14

This Amendment 14, ("Amendment"), dated June 10, 2014 ("Effective Date") is to the Master Services Agreement dated March 2, 2009 ("Agreement") between Novati Technologies, Inc. ("Novati"), and BioNano Genomics ("Customer"). The Agreement mandates that all changes must be in a writing signed by the parties. Except as provided below, all the provisions of the Agreement shall remain in effect and apply to the amended language. Accordingly, the parties agree to the following:

1) The parties agree that the unspent portion of Customer's MFC for 2Q2014, shall carry forward into the next calendar quarter, 3Q2014.

Effect of this Amendment: In the event of any conflict between the Agreement and this Amendment, this Amendment shall control. Except as amended or as otherwise set forth in this Amendment, the Agreement shall continue unchanged and in full force and effect in accordance with its terms.

LIST OF ATTACHMENTS: Following is a list of attachments to this Amendment, including all Schedules and Exhibits. Any future added attachment must include a dated Amendment or provision referencing the Agreement and must be executed by all parties.

With due authority from our respective companies, we hereby signify our consent to this Agreement by signing below,

Novati Technologies, Inc.

Signature: /s/ David B. Anderson

Printed Name: David B. Anderson
Title: President and CEO
Date: June 10, 2014

Customer: BioNano Genomics

Signature: /s/ Joel R. Jung

Printed Name: Joel R. Jung
Title: CFO
Date: June 11, 2014

["**AMEND462693-015*5*39906292273020011652677427749133143225771693862 2*1*1***]

AMENDMENT 15

NOVATI TECHNOLOGIES, INC.

BioNano Genomics
AMEND462693-016
Initials: Novati: ____ Customer: ____

This Amendment 15, ("Amendment"), dated September 18, 2014 ("Effective Date") is to the Master Services Agreement dated March 2, 2009 ("Agreement") between Novati Technologies, Inc. ("Novati"), and BioNano Genomics ("Customer"). The Agreement mandates that all changes must be in a writing signed by the parties. Except as provided below, all the provisions of the Agreement shall remain in effect and apply to the amended language. Accordingly, the parties agree to the following:

1) The parties agree that the unspent portion of Customer's MFC for 3Q2014, shall carry forward into the next calendar quarter, 4Q2014.

Effect of this Amendment: In the event of any conflict between the Agreement and this Amendment, this Amendment shall control. Except as amended or as otherwise set forth in this Amendment, the Agreement shall continue unchanged and in full force and effect in accordance with its terms.

LIST OF ATTACHMENTS: Following is a list of attachments to this Amendment, including all Schedules and Exhibits. Any future added attachment must include a dated Amendment or provision referencing the Agreement and must be executed by all parties.

With due authority from our respective companies, we hereby signify our consent to this Agreement by signing below,

Novati Technologies, Inc.

Signature: /s/ David B. Anderson

Printed Name: David B. Anderson
Title: President and CEO
Date: 25 Sep. 2014

Customer: BioNano Genomics

Signature: /s/ R. Erik Holmlin

Printed Name: R. Erik Holmlin
Title: President & CEO
Date: 26 Sept 2014

[***AMEND462693-016*5*4441460192313718450944675938729040868082770253336*1*1***]

NOVATI TECHNOLOGIES, INC.

BioNano Genomics
AMEND462693-017
Initials: Novati: PLL Customer:

AMENDMENT 16

This Amendment 16, ("Amendment"), dated October 7, 2014 ("Effective Date") is to the Master Services Agreement dated March 2, 2009 ("Agreement") between Novati Technologies, Inc. ("Novati"), and BioNano Genomics ("Customer"). The Agreement mandates that all changes must be in a writing signed by the parties. Except as provided below, all the provisions of the Agreement shall remain in effect and apply to the amended language. Accordingly, the parties agree to the following:

1) Pricing for the […***…] is […***…] per wafer. Min lot size = […***…] wafers which is consistent with the current commercial terms.

Effect of this Amendment: In the event of any conflict between the Agreement and this Amendment, this Amendment shall control. Except as amended or as otherwise set forth in this Amendment, the Agreement shall continue unchanged and in full force and effect in accordance with its terms.

LIST OF ATTACHMENTS: Following is a list of attachments to this Amendment, including all Schedules and Exhibits. Any future added attachment must include a dated Amendment or provision referencing the Agreement and must be executed by all parties.

With due authority from our respective companies, we hereby signify our consent to this Agreement by signing below,

Novati Technologies, Inc.

Signature: /s/ David B. Anderson

Printed Name: David B. Anderson
Title: President and CEO
Date: 2014-10-22

Customer: BioNano Genomics

Signature: /s/ R. Erik Holmlin

Printed Name: Title:

Date:

[***AMEND462693-016*5*444146019231371845094467593672904066082776253336*1*1***]

AMENDMENT 17

This Amendment 17, (“Amendment”), dated April 1, 2015 (“Effective Date”) is to the Master Services Agreement dated March 2, 2009 (“Agreement”) between Novati Technologies, Inc. (“Novati”), and BioNano Genomics (“Customer”). The Agreement mandates that all changes must be in a writing signed by the parties. Except as provided below, all the provisions of the Agreement shall remain in effect and apply to the amended language. Accordingly, the parties agree to the following:

1) Both parties agree to extend the expiration date of the Agreement from March 31, 2015 to May 31, 2015.

Effect of this Amendment: In the event of any conflict between the Agreement and this Amendment, this Amendment shall control. Except as amended or as otherwise set forth in this Amendment, the Agreement shall continue unchanged and in full force and effect in accordance with its terms.

LIST OF ATTACHMENTS: Following is a list of attachments to this Amendment, including all Schedules and Exhibits. Any future added attachment must include a dated Amendment or provision referencing the Agreement and must be executed by all parties.

With due authority from our respective companies, we hereby signify our consent to this Agreement by signing below,

Novati Technologies, Inc.

Signature: /s/ David B. Anderson

Printed Name: David B. Anderson
Title: President and CEO
Date: 4/5/2015

Customer: **BioNano Genomics**

Signature: /s/ Mark Borodkin

Printed Name: Mark Borodkin
Title: VP, Systems Development
Date: 4/2/2015

[***AMEND462693-018*5*1477158233031678143960812750467235237470254372 65*1*1***]

AMENDMENT 18

This Amendment 18, ("Amendment"), dated June 1, 2015 ("Effective Date") is to the Master Services Agreement dated March 2, 2009 ("Agreement") between Novati Technologies, Inc. ("Novati"), and BioNano Genomics ("Customer"). The Agreement mandates that all changes must be in a writing signed by the parties. Except as provided below, all the provisions of the Agreement shall remain in effect and apply to the amended language. Accordingly, the parties agree to the following:

1) The parties agree to amend the Agreement describing services that will be provided by Novati for Customer starting on the Effective Date. Novati will provide to Customer the services described in Exhibit A for the fees set forth therein subject to any additional terms and conditions set forth therein.

Effect of this Amendment: In the event of any conflict between the Agreement and this Amendment, this Amendment shall control. Except as amended or as otherwise set forth in this Amendment, the Agreement shall continue unchanged and in full force and effect in accordance with its terms.

LIST OF ATTACHMENTS: Following is a list of attachments to this Amendment, including all Schedules and Exhibits. Any future added attachment must include a dated Amendment or provision referencing the Agreement and must be executed by all parties.

Exhibit

With due authority from our respective companies, we hereby signify our consent to this Agreement by signing below,

Novati Technologies, Inc.

Signature: /s/ David B. Anderson

Printed Name: David B. Anderson
Title: President and CEO
Date: 6-2-2015

Customer: BioNano Genomics

Signature: /s/ Erik Holmlin

Printed Name: Erik Holmlin
Title: Chief Executive Officer
Date: 29 May 2015

[***AMEND462693-011*2*550619168885826308795323706867240751779597722463*1*5***]

Exhibit A Commercial Quotation
For BioNano Genomics's Alpha Chip Development & Production

START DATE: 06-01-2015 **DURATION:** 05-31-2016

Novati proposes the date above on which Novati will begin providing the following services under the Master Services Agreement ("Start Date"). Project Duration is the period of time for the project described in this Quotation.

1.0 DESCRIPTION OF SERVICES:

Novati shall provide development and pilot production services in support of BioNano Genomics' Alpha Chip requirements. Novati will start with semiconductor processes that exist or are being developed by BioNano Genomics, and will provide other support as described herein ("Services"). Novati shall use commercially reasonable efforts to perform the Services requested by BioNano Genomics, subject to the ability of Novati to perform these Services on Novati's existing equipment and using standard materials and process recipes that are compatible with the equipment and resources of Novati.

1.4 SUMMARY OF SERVICES THAT MAY BE PROVIDED:

- Fab Services
- Engineering Services

3.0 NOVATI SERVICE DEFINITIONS:

Fab Services:

1. [...***...]
2. [...***...]
3. [...***...]
4. [...***...]
5. [...***...]
6. [...***...]

* or as available per Novati's then-current standard operating schedule

Engineering Services: (Defined in the Agreement)

1. […***…]
2. These services are to be executed in collaboration with customers direction and management

4.0 ADDITIONAL SERVICES:**

Additional Training Services	[...***...]
Additional Cubicles & Lockable Office Space	[...***...]
Reticles	[...***...]
Analytical Services	[...***...]

** Additional Services subject to availability

5.0 TABLE-1–MOVE PRICING:

Tool Type /Area	Category	Development (6-wfr min lot) Tier 1	Tier 2	Tier 3	Fixed Flow (25-wfr min lot)	Fixed Flow (25-wfr min lot)
[...***...]	[...***...]	[...***...]	[...***...]	[...***...]	[...***...]	[...***...]
[...***...]	[...***...]	[...***...]	[...***...]	[...***...]	[...***...]	[...***...]
[...***...]	[...***...]	[...***...]	[...***...]	[...***...]	[...***...]	[...***...]
[...***...]	[...***...]	[...***...]	[...***...]	[...***...]	[...***...]	[...***...]
[...***...]	[...***...]	[...***...]	[...***...]	[...***...]	[...***...]	[...***...]
[...***...]	[...***...]	[...***...]	[...***...]	[...***...]	[...***...]	[...***...]
[...***...]	[...***...]	[...***...]	[...***...]	[...***...]	[...***...]	[...***...]
[...***...]	[...***...]	[...***...]	[...***...]	[...***...]	[...***...]	[...***...]
[...***...]	[...***...]	[...***...]	[...***...]	[...***...]	[...***...]	[...***...]

6.0 NOVATI SERVICE FEE SCHEDULE:

Item	Fees	Frequency

a) Tier 1 Pricing

- [...***...] Per Table 1 Per move

Engineering Services — Process Engineering Support [...***...] per hour

Tier 1 Minimum Financial Commitment [...***...] Quarterly

b) Tier 2 Pricing (Baseline Minimum Financial Commitment)

- [...***...] Per Table 1 Per move

Engineering Services — Process Engineering Support [...***...] per hour

Tier 2 Minimum Financial Commitment [...***...] Quarterly

c) Tier 3 Pricing

- [...***...] Per Table 1 Per move

Engineering Services — Process Engineering Support [...***...] per hour

Tier 3 Minimum Financial Commitment [...***...] Quarterly

d) Expedite Fees

[...***...] [...***...] Per request

[...***...] [...***...] CoO approval

[...***...] [...***...] CoO approval

ADDITIONAL NOTES:

1. [...***...]
2. [...***...].
3. [...***...].
4. Wafers can be processed through any portion of the process Flow that is designated as “Fixed Flow”, at the Fixed Flow pricing per Table-1, provided minimum lot size criteria are met. These wafers can be staged for further development / small lot size processing through subsequent processes including TSV and bond. These “child” lots will be billed for all subsequent steps at the appropriate development pricing tier and minimum lot size. Fixed Flow is defined as any part of the process flow that is mutually agreed as not requiring engineering development or support to be processed in line.
5. Novati and Customer will mutually agree upon production FMEA criteria and risks, based upon completion of TDP (Technology Development Process) criteria to move from POC to a “validated” flow. Once established and agreed upon with risks effectively mitigated, Novati will commit to deliver wafers against those criteria, and wafers that fail to meet those criteria will be reimbursable or replaced at Novati expense. Prior to TDP completion and established FMEA criteria, reimbursable events will be limited to those in which a mis- process occurs at fault of Novati, or where a failed Novati tool qualification/spec causes a scrap event. In the event of Novati mis-process / tool-related event causing scrap, if a replacement lot is started it will be elevated to “Hot” status at no additional charge to customer, or “Rocket” status at […***…] up-charge. Customer may at their discretion apply this status to a lot already in line. If Customer requests expedited status prior to assignment of root cause, Customer agrees to bear potential expenses in the event root cause is determined not to be a Novati mis-process or tool-related issue. Expenses will be totalled and invoiced after the final failure analysis report has been presented to Customer.

6. The next lot to arrive at a step where the previous lot incurred a scrap event will be processed as follows: A single wafer will be sent ahead through the tool to verify correct operation before the rest of the lot is cleared to process. The lot will then be merged back into a single lot immediately after this operation. No min-lot or split-lot charge shall be assessed for this activity.
7. Novati shall furnish to Customer a list of current qualification/specs for each tool in Customer's process flow, and shall update Customer when specifications are revised.

7.0 TERMS:

1) *The Minimum Financial Commitment (MFC) for Fab Services and Engineering Services shall be per the selected Tier in Section 5. At the signing of contract unless otherwise specified, the Minimum Financial Commitment will be set at the Tier 1 Baseline. Novati will invoice Customer […***…] 15 days prior to the start of the fiscal quarter and each subsequent fiscal month thereafter. All prepayments shall be due NET15 days from invoice. Actual usage shall be "trued up" at the end of each Novati fiscal month for actual services provided and is due NET15 days from invoice. In the event the designated MFC is not fully consumed through no fault of Customer, up to […***…] of the MFC value can be carried forward to the next quarter. The carry-forward amount must be consumed in the subsequent quarter or it shall be forfeited. In the event that extended tool down events cause the MFC not to be fully consumed, the […***…] cap shall not apply, and the carry-forward period shall be extended to up to 6 months from the time the tool is re-qualified to meet specification.*
2) *Customer may change the election of the pricing tier on a quarterly basis by providing 2 weeks advanced written notice prior to each Novati fiscal quarter. If no written notice is received 2 weeks prior to the beginning of any quarter, the pricing tier will automatically be set to Tier 1.*
3) *The first and last billing cycle fees and service quantities shall be prorated to the actual start date and then continue in accordance with Novati's fiscal calendar such that all invoicing shall follow Novati fiscal month start and end dates.*
4) *Additional Activities, Engineering Hours, Additional Tool Training, access to additional equipment and resources, and other Extraordinary Expenses ('Additional Services") shall be made available at Novati's sole discretion. BioNano Genomics shall pay for all Additional Services per the terms of the Master Services Agreement.*

1.2 LICENSED TECHNOLOGY:

The Services listed above and Novati's process technology, including recipes and steps, used in the performance of services shall be provided and licensed to Customer under the terms, conditions and limitations of the Master Services Agreement, which shall override and supersede any terms and conditions in any customer provided documents.

AMENDMENT 19

This Amendment 19, ("Amendment"), dated July 25 2016 ("Effective Date") is to the Master Services Agreement dated March 2, 2009 ("Agreement") between Novati Technologies, Inc. ("Novati"), and BioNano Genomics ("Customer"). The Agreement mandates that all changes must be in a writing signed by the parties. Except as provided below, all the provisions of the Agreement shall remain in effect and apply to the amended language. Accordingly, the parties agree to the following:

1) The parties agree to amend the Agreement to incorporate Exhibit A, describing development services, which will be provided by Novati for Customer starting on the Effective Date for the fees set forth therein.
2) The parties agree to amend the Agreement to extend the expiration date to March 31, 2017.

Effect of this Amendment: In the event of any conflict between the Agreement and this Amendment, this Amendment shall control. Except as amended or as otherwise set forth in this Amendment, the Agreement shall continue unchanged and in full force and effect in accordance with its terms.

LIST OF ATTACHMENTS: Following is a list of attachments to this Amendment, including all Schedules and Exhibits. Any future added attachment must include a dated Amendment or provision referencing the Agreement and must be executed by all parties.

Exhibit A – Development Services

With due authority from our respective companies, we hereby signify our consent to this Agreement by signing below,

Novati Technologies, Inc.

Signature: /s/ Rod Langley (on behalf of John Behnke)

Printed Name: John Behnke
Title: President
Date: 7-18-2016

Customer: BioNano Genomics

Signature: /s/ Erik Holmlin

Printed Name: Erik Holmlin
Title: Chief Executive Officer
Date: 7/14/16

Exhibit A
Commercial Quotation – Development Services

START DATE: 07-01-2016 **END DATE:** 03-31-2017

Novati proposes the date above on which Novati will begin providing the following services under the Master Services Agreement ("Start Date"). Project Duration is the period of time for the project described in this quotation.

1.0 DESCRIPTION OF SERVICES:

Novati shall provide development and pilot production services in support of BioNano Genomics' Alpha Chip requirements. Novati will start with semiconductor processes that exist or are being developed by BioNano Genomics, and will provide other support as described herein ("Services"). Novati shall use commercially reasonable efforts to perform the Services requested by BioNano Genomics, subject to the ability of Novati to perform these Services on Novati's existing equipment and using standard materials and process recipes that are compatible with the equipment and resources of Novati.

1.5 SUMMARY OF SERVICES THAT MAY BE PROVIDED:

- Fab Services
- Engineering Services

3.0 NOVATI SERVICE DEFINITIONS:

Fab Services:

1. […***…]

2. […***…]

3. […***…]

4. […***…]

5. […***…]

6. […***…]

* or as available per Novati's then-current standard operating schedule

Engineering Services: (Defined in the Agreement)

1. […***…]

2. […***…]

4.0 ADDITIONAL SERVICES:**

Additional Training Services […***…]

Additional Cubicles & Lockable Office Space […***…]

Reticles […***…]

Analytical Services […***…]

** Additional Services subject to availability

5.0 TABLE-1–MOVE PRICING:

		Development (6-wfr min lot)		Fixed Flow (25-wfr min			Fixed Flow (25-wfr min	
Tool Type /Area	**Category**	**Tier 0**	**Tier 1**	**Tier 2**	**Tier 3**	**lot)**	**lot)**	
[…***…]		[…***…]	[…***…]	[…***…]	[…***…]	[…***…]	[…***…]	[…***…]
[…***…]		[…***…]	[…***…]	[…***…]	[…***…]	[…***…]	[…***…]	[…***…]
[…***…]		[…***…]	[…***…]	[…***…]	[…***…]	[…***…]	[…***…]	[…***…]
[…***…]		[…***…]	[…***…]	[…***…]	[…***…]	[…***…]	[…***…]	[…***…]
[…***…]		[…***…]	[…***…]	[…***…]	[…***…]	[…***…]	[…***…]	[…***…]
[…***…]		[…***…]	[…***…]	[…***…]	[…***…]	[…***…]	[…***…]	[…***…]
[…***…]		[…***…]	[…***…]	[…***…]	[…***…]	[…***…]	[…***…]	[…***…]
[…***…]		[…***…]	[…***…]	[…***…]	[…***…]	[…***…]	[…***…]	[…***…]
[…***…]		[…***…]	[…***…]	[…***…]	[…***…]	[…***…]	[…***…]	[…***…]

6.0 NOVATI SERVICE FEE SCHEDULE:

Item		Fees	Frequency
a)	**Tier 0 Pricing (no MFC)**	Per Table 1	Per move
b)	**Tier 1 Pricing**		
	• […***…]	Per Table 1	Per move

Engineering Services — Process Engineering Support […***…] per hour

Tier 1 Minimum Financial Commitment […***…] Quarterly

b)	**Tier 2 Pricing (Baseline Minimum Financial Commitment)**	Per Table 1	Per move
	• […***…]		

Engineering Services — Process Engineering Support […***…] per hour

Tier 2 Minimum Financial Commitment […***…] Quarterly

c) Tier 3 Pricing

- […***…]

Per Table 1 Per move

Engineering Services — Process Engineering Support […***…] per hour

Tier 3 Minimum Financial Commitment […***…] Quarterly

e) Expedite Fees

[…***…]	[…***…]	Per request
[…***…]	[…***…]	CoO approval
[…***…]	[…***…]	CoO approval

ADDITIONAL NOTES:

1. Deep silicon etch will have a […***…] move multiplier applied. […***…].

2. […***…].

3. Wafers can be processed through any portion of the process flow that is designated as "Fixed Flow", at the Fixed Flow pricing per Table-1, provided minimum lot size criteria are met. These wafers can be staged for further development / small lot size processing through subsequent processes including TSV and bond. These "child" lots will be billed for all subsequent steps at the appropriate development pricing tier and minimum lot size. Fixed Flow is defined as any part of the process flow that is mutually agreed as not requiring engineering development or support to be processed in line.

4. The next lot to arrive at a step where the previous lot incurred a scrap event will be processed as follows: A single wafer will be sent ahead through the tool to verify correct operation before the rest of the lot is cleared to process. The lot will then be merged back into a single lot immediately after this operation. No min-lot or split-lot charge shall be assessed for this activity. In the event of a Novati mis-process / tool-related event causing scrap, if a replacement lot is started it will be elevated to "Hot" status at no additional charge to customer, or "Rocket" status at […***…] up-charge. Customer may at their discretion apply this status to a lot already in line. If Customer requests expedited status prior to assignment of root cause, Customer agrees to bear potential expenses in the event root cause is determined not to be a Novati mis-process or tool-related issue. Expenses will be totaled and invoiced after the final failure analysis report has been presented to Customer.

5. Novati shall furnish to Customer a list of current qualification/specs for each tool in Customer's process flow, and shall update Customer when specifications are revised.

7.0 TERMS:

1) *The Minimum Financial Commitment (MFC) for Fab Services and Engineering Services shall be per the selected Tier in Section 5. At the signing of contract unless otherwise specified, the Minimum Financial Commitment will be set at the Tier 1 Baseline. Novati will invoice Customer […***...] 15 days prior to the start of the fiscal quarter and each subsequent fiscal month thereafter. All prepayments shall be due NET15 days from invoice. Actual usage shall be "trued up" at the end of each Novati fiscal month for actual services provided and is due NET15 days from invoice. In the event the designated MFC is not fully consumed through no fault of Customer, up to […***...] of the MFC value can be carried forward to the next quarter. The carry-forward amount must be consumed in the subsequent quarter or it shall be forfeited. In the event that extended tool down events cause the MFC not to be fully consumed, the […***...] cap shall not apply, and the carry-forward period shall be extended to up to 6 months from the time the tool is re-qualified to meet specification.*
2) *Customer may change the election of the pricing tier on a quarterly basis by providing 2 weeks advanced written notice prior to each Novati fiscal quarter. If no written notice is received 2 weeks prior to the beginning of any quarter, the pricing tier will automatically be set to Tier 1.*
3) *The first and last billing cycle fees and service quantities shall be prorated to the actual start date and then continue in accordance with Novati's fiscal calendar such that all invoicing shall follow Novati fiscal month start and end dates.*
4) *Additional Activities, Engineering Hours, Additional Tool Training, access to additional equipment and resources, and other Extraordinary Expenses ('Additional Services") shall be made available at Novati's sole discretion. BioNano Genomics shall pay for all Additional Services per the terms of the Master Services Agreement.*

5) This Agreement can be canceled by either party giving 90 days written notice in accordance with the terms of the MSA.

1.3 LICENSED TECHNOLOGY:

The Services listed above and Novati's process technology, including recipes and steps, used in the performance of services shall be provided and licensed to Customer under the terms, conditions and limitations of the Master Services Agreement, which shall override and supersede any terms and conditions in any customer provided documents.

NOVATI TECHNOLOGIES, INC.

BioNano Genomics
AMEND462693-021
Initials: Novati: Customer:

AMENDMENT 20

This Amendment 20, ("Amendment"), dated August 1, 2016 ("Effective Date") is to the Master Services Agreement dated March 2, 2009 ("Agreement") between Novati Technologies, Inc. ("Novati"), and BioNano Genomics ("Customer"). The Agreement mandates that all changes must be in a writing signed by the parties. Except as provided below, all the provisions of the Agreement shall remain in effect and apply to the amended language. Accordingly, the parties agree to the following:

1) Novati agrees to provide the production services set forth in Exhibit A in accordance with the provisions of the Production Services Schedule both of which are incorporated into the Agreement by this Amendment.
2) The parties set July 31, 2017 expiration date of Amendment 20 of the Agreement.

Effect of this Amendment: In the event of any conflict between the Agreement and this Amendment, this Amendment shall control. Except as amended or as otherwise set forth in this Amendment, the Agreement shall continue unchanged and in full force and effect in accordance with its terms.

LIST OF ATTACHMENTS: Following is a list of attachments to this Amendment, including all Schedules and Exhibits. Any future added attachment must include a dated Amendment or provision referencing the Agreement and must be executed by all parties.

Exhibit A – Production Services Production Service Schedule

With due authority from our respective companies, we hereby signify our consent to this Agreement by signing below,

Novati Technologies, Inc.

Signature: /s/ Rod Langley (on behalf of John Behnke)

Printed Name: John Behnke
Title: President
Date: 7/18/16

Customer: BioNano Genomics

Signature: /s/ Erik Holmlin

Printed Name: Erik Holmlin
Title: Chief Executive Officer
Date: 7/14/16

Exhibit A

Commercial Quotation – Production Services

START DATE: 08-01-2016 **END DATE:** 07-31-2017

Novati proposes the date above on which Novati will begin providing the following services under the Master Services Agreement ("Start Date"). Project Duration is the period of time for the project described in this quotation.

1.0 DESCRIPTION OF SERVICES:

Novati shall provide production services in support of BioNano Genomics' Alpha-9 Chip requirements. Novati will manage the production line to meet the committed production forecast as provided by BioNano Genomics.

1.6 SUMMARY OF SERVICES THAT MAY BE PROVIDED:

- Product Wafers

3.0 NOVATI SERVICE DEFINITIONS:

Fab Services:

1. […***…]
2. […***…]
3. […***…]
4. […***…]
5. […***…]
6. […***…]

* or as available per Novati's then-current standard operating schedule

Engineering Services: (Defined in the Agreement)

1. Contracted engineering services may be available to Customer upon request as deemed necessary by Customer, subject to Novati approval.

2. Engineering support for production wafers shall be provided to perform the agreed production services for Customer in accordance with the terms of the Production Services Schedule. Any additional engineering support that is requested by Customer, subject to Novati approval, shall be charged engineering hourly rates per Section 6 in Exhibit A to this Amendment.

4.0 ADDITIONAL SERVICES:**

Additional Training Services […***…]

Additional Cubicles & Lockable Office Space […***…]

Reticles […***…]

Analytical Services […***…]

** Additional Services subject to availability

NOVATI TECHNOLOGIES, INC.

BioNano Genomics
AMEND462693-021
Initials: Novati: Customer:

5.0 TABLE-2–PRODUCT WAFER PRICING:

WAFER PRICING TABLE 2.0			
[…***…]			
[…***…]	[…***…]	[…***…]	[…***…]
[…***…]	[…***…]	[…***…]	[…***…]
[…***…]	[…***…]	[…***…]	[…***…]
[…***…]	[…***…]	[…***…]	[…***…]
[…***…]	[…***…]	[…***…]	[…***…]
[…***…]			
[…***…]	[…***…]	[…***…]	[…***…]
[…***…]	[…***…]	[…***…]	[…***…]
[…***…]	[…***…]	[…***…]	[…***…]
[…***…]	[…***…]	[…***…]	[…***…]
[…***…]	[…***…]	[…***…]	[…***…]
[…***…]			
[…***…]	[…***…]	[…***…]	[…***…]
[…***…]	[…***…]	[…***…]	[…***…]
[…***…]	[…***…]	[…***…]	[…***…]
[…***…]	[…***…]	[…***…]	[…***…]

For all wafers, the […***…].

A Production Control and Inventory Management fee of […***…] of the price will be added to each lot shipped.

Note: Initial default contract value for the first three months is: […***…]. Customer is to specify in writing at time of execution of this Amendment if other values are required. Wafer volume and requirements for subsequent months can be adjusted based on Customers' written adjusted monthly forecast.

6.0 TERMS:

1) *Customer shall provide a rolling 12 month forecast for product wafers on a monthly basis. The immediate […***…] of said forecast shall be considered a binding Take-or-Pay commitment. The minimum monthly forecast shall be […***…]. Production deliveries will start in the third month after execution of this Amendment. Example: Amendment start date is August 1, 2016. The first three (3) months committed production forecast would be for November, December, January respectively. Unless approved by Customer in writing, Novati will limit actual lot sizes in*

*2) Customer shall place purchase orders for wafers in minimum lot sizes and pricing indicated in Table 2 — Product Wafer Pricing — and in accordance with the rolling forecast provided by Customer. Novati shall deliver wafers per individual purchase order subject to the terms of the Agreement. Novati shall ship wafers within 4 weeks of order placement, and shall maintain any buffer inventory as necessary to meet this lead time commitment. Novati reserves the right, in its sole discretion, to decline purchase orders In excess of the committed forecast, or to require other than the committed lead time to fulfill such orders. For all orders for which Novati has a lead time of 4 weeks or longer, if Novati is responsible for delivery delays of more than seven (7) days after the committed delivery date, customer will receive a [...***...] discount for each additional week of delay up to 3 weeks.*

*3) An Initial Deposit of 6 weeks of the agreed upon minimum product shipments [...***...] shall be invoiced to customer and due upon execution of this Amendment, in order to reserve future capacity. Customer shall indicate the minimum monthly production quantity in writing to Novati at the time of execution of this Amendment. Novati shall build buffer inventory and maintain said inventory in the line in order to meet <4 week Cycle Time from order placement in support of Customer's committed product requirements.*

4) The initial term of this Exhibit A is one (1) year. Production services under this Exhibit A may be terminated on 90 days written notice. Work in progress and any buffer inventory held in the line at the time of notice of termination shall be used to fulfill the final three months of production forecast. Upon termination, in addition to any pending charges for services rendered and product deliveries, Customer will be charged liquidated damages to cover Novati's costs, including without limitation charges for the partially processed buffer inventory in the line at the time of notice. Buffer inventory and WIP covered in liquidated damages shall be no more than the # of wafers to satisfy the forecast for the 3 months following the termination date. For example, if the forecast for each of months 1, 2, 3 is 6 wafers per month at time of termination, Customer is liable for liquidated damages of the actual number of wafers in WIP and buffer inventory up to 18 wafers. The Initial Deposit shall be applied to the final invoice for services and liquidated damages, with any remaining balance being due from Customer within 30 days of the date of the final invoice. In the event of expiration, work may continue after the expiration date only if both parties explicitly allow this in writing.

*5) All product wafers shipped will conform to the specifications for [...***...] associated with the selected wafer price and measured at the indicated operations outlined in Table 2. Additionally, all shipped wafers will have an average [...***...]. These measurements will be made inline and In accordance with the following Novati specifications: [...***...].*

6) A wafer that does not meet the above conditions will be classified as nonconforming material. Nonconformity will be determined by inline data. In cases of customer returns failure analysis techniques such as SEM and TEM can be used to verify nonconformity.

7) Product wafers shall be invoiced upon completion and arrival at Novati's shipping dock. All wafers are Ex-Works Novati and Customer shall directly arrange shipping and insurance. Payments shall be due NET-30 days from Invoice.

8) Borofloat glass lid wafers shall be procured by customer and drop-shipped to Novati in sufficient quantity and lead time as to support the production requirements. Novati will provide Customer with an update of their glass lid wafer Inventory and 3 month demand forecast within 2 weeks of the Customer submitting the monthly wafer forecast. Novati is not responsible for shortages resulting from incoming defective glass lid wafers. Customer is responsible for managing the right supply level of glass lid wafers at Novak including a buffer to account for incoming defective lids.

["**AMEND462693-021*2*168146139059316741953512557350932251541895635048*3*11**"]

7.0 LICENSED TECHNOLOGY:

The Services listed above and Novati's process technology, including recipes and steps, used in the performance of services shall be provided and licensed to Customer under the terms, conditions and limitations of the Master Services Agreement, which shall override and supersede any terms and conditions in any customer provided documents.

[***AMEND462693-021*2*168146138059316741953612557350632251541895635048*6*11***]

PRODUCTION SERVICE SCHEDULE

This Production Service Schedule (the "**Schedule**") is entered into effective as of August 1, 2016, ("Effective Date") between **NOVATI TECHNOLOGIES, INC.**, and BioNano Genomics, ("Customer") as an attachment to the Master Services Agreement ("Agreement"), between the parties, dated March 2, 2009. Capitalized terms used but not defined herein have the meanings ascribed to them in the Agreement. All terms and conditions in this Schedule are in addition to the terms and conditions set forth in the Agreement. In the event of any conflict between the provisions of this Schedule and the Agreement, the Agreement shall govern unless explicitly superseded in this Schedule.

Customer desires that Novati provide manufacturing services to produce certain agreed items for use in Customer's business or end product ("Production Services"). This Schedule shall apply only to such production services; other services provided by Novati shall be pursuant to other schedules for such services.

1. DEFINITIONS

1.1. Allowed Delivery Tolerance means the mutually agreed amount of deviation in the number of units of Product from the exact amount of units of Product Customer has released in a given Product Start Release that may be delivered and be considered to have to have fulfilled the Product Start Release order.

1.2. Critical Step Specification means a mutually agreed specification requested by Customer and agreed by Novati to be needed for the manufacturing of a Product. The critical step specification is based upon the FMEA approved by the parties and the SPC data available to substantiate the performance levels and expectations of customer technology.

1.3. Delivery Date means the date the Products desired by Customer for delivery to the Delivery Location, as specified on a Release, or as otherwise agreed to by the parties in writing.

1.4. Delivery Location means the location to which the Products are requested to be delivered, as specified in a Release or through other ordering mechanism.

1.5. Engineering Samples means finished substrate or the Product generated from a finished substrate delivered prior to completion of the Product Production Release Plan that may be provided to Customer's customer for evaluation purposes.

1.6. Excess In-Process Loss means any In-Process Loss during a Novati fiscal quarter in excess the amount allowed by the Mechanical Yield.

1.7. FMEA means Failure Mode Effect Analysis, and is a document used to describe process maturity at the critical steps within the product flow. The FMEA is a living document that will evolve through mutual agreement of the parties throughout the term of this Schedule.

1.8. In-Process Loss means any loss of partially completed Product substrates on a Production Line.

1.9. In-Process Loss Rate means the rate loss of partially completed Product substrates on a Production Line as defined by total number of Product substrates lost in a Novati fiscal quarter divided by the total number of Product substrates started in the same Novati Fiscal quarter.

1.10. Lead Time means the period of time, as may be specified by Novati, between the date a Release is received by Novati and the date Novati shall ship the Products to the Delivery Location.

1.11 Mechanical Yield means the allowable In-Process Loss Rate of partially completed Product substrates on a Production Line as mutually agreed in this Agreement.

1.12. Minimum Product Volume Commit means the minimum total amount of dollars of Product defined in the Agreement.

1.13. Production Line means the process flow sequence, route, recipes, equipment and specifications that have been utilized and mutually accepted as having had completed a Production Release Plan for one or more Products.

1.14. Product or Products mean finished substrate or substrates (usually wafers) requested of Novati by Customer.

1.15. Product Lot means a group of Product substrates started on the Production Line to be possessed together.

1.16. Production Release Plan means a plan that is mutually agreed between Novati and Customer defining the conditions required for release of a Product from development status to Production.

[***AMEND462693-021*2*16814613805931674195361255735063225154189563504$*6*11***]

1.17. Prototype or Prototype Product means any Product delivered prior to completion of the Production Release Plan.

1.18. Proven Product means a Product manufactured using a process that has verified functionality and yield and otherwise meets, and continues to meet, the Production Release Plan as demonstrated in one or more Production Release Lots.

1.19. Production Release Lot means a group of substrates that are processed together to validate that a Product can go into regular production pursuant to a Production Release Plan.

1.20. Product Start Release means a written order requesting and authorizing Novati to deliver a specified quantity of Products covered by a contractual commitment, on a specified Delivery Date.

1.21. SPC means Statistical Process Control and is a means for ensuring tools used in the product flow are maintained within an allowable specification range.

2. Customer Materials: Customer may be obligated to provide certain materials to Novati to enable it to manufacture Products, including but not limited to process flow, reticles/masks, Product reticle GDSII data, recipes, recipe characterization data, special equipment configurations, and non-Novati standard raw materials as specified in detail elsewhere in this Agreement.

2.1. If specific raw materials are required for the substrates to be processed for Customer, then it shall be mutually agreed who shall be responsible for procuring and setting stocking levels of such materials. If Novati purchases such materials, and they are such that they cannot be used by Novati for other customers, and if quantities of such materials are remaining after completion of orders or due to cancellations of orders, Customer agrees to pay Novati for such materials. Depending upon the nature of these materials and only if Customer pays for all packaging, transportation, and delivery charges, Novati may, in its sole discretion, determine whether such materials will be delivered to Customer.

2.2. In-Process Loss Claim Limitations: Unless mutually agreed in writing, Novati will not be liable for the costs of Customer supplier materials in the event of In-Process Loss.

3. Forecasts: Fifteen (15) days prior to the start of each month during the term of this Schedule, Customer shall provide a rolling forecast for the next 12 months of its desired production quantities. The forecast shall include the number of Products required each month for 12 months. The first 3 months of each 12 month forecast are firm contractual commitments such that Customer shall be obligated to pay each month to Novati the dollar commitment for each of` those 3 months notwithstanding any subsequent changes requested by Customer. The remaining 9 months of the forecast may be changed by Customer from the numbers for the corresponding months in previous monthly forecasts, provided however, that if any materials are procured by Novati solely for the services for Customer in anticipation of a forecast, Customer shall, if requested by Novati, reimburse Novati for such materials.

4. Periodic Management Business Review: Periodically depending on need, but at least semi-annually, the parties agree to meet to review mutually agreed key metrics for Production Line used for Customer's Product.

5. Product Scheduling: Consistent with previously provided forecasts, Customer shall provide Novati regularly, in a format to be mutually agreed, with an order detail tentatively titled "Product Start Release," setting forth the dates and quantities of Product it desires to be delivered. Product Releases will be, at a minimum, set by the Minimum Product Volume Commit. Novati shall review such submitted Product Start Release schedules and shall acknowledge in writing to Customer that all of the information is acceptable; provided, however, if portions of the Product Start Release schedule cannot be accommodated or met, Novati shall notify Customer and negotiate mutually acceptable changes.

6. Product Delivery: Novati will use commercially reasonable efforts to deliver the Novati-acknowledged volume of Product requested byCustomer within the mutually agreed Lead Time, subject to the Allowed Delivery Tolerance. Customer will be invoiced for the actual amount of Product delivered or for the charges associated with the Minimum Product Volume Commit, whichever is greater.

7. Expedited Product Schedules: Customer may request Delivery Dates with a Lead Time shorter than the normal Novati-defined Lead Time, which if accepted by Novati, may require additional fees. Customer acknowledges that Novati's obligations to its other customers may affect Novati's ability to agree to Customer's desired scheduling and agrees that Novati shall have sole discretion with respect to managing the scheduling of Novati resources.

8. Customer Cancellation Policies: In the event that Customer desires to cancel or delay all or portions of previously scheduled deliveries, Customer shall notify Novati in writing with specific details of its desired changes. Customer shall remain obligated to pay fees contractually committed, the Minimum Product Volume Commit, and charges owed by Customer under the terms of this Schedule, including without limitation material expenses due pursuant to Section 2.1. To the extent that minimum commitments are exceeded, cancellation of other orders shall incur a cancellation charge equal to fees incurred for actual processing performed prior to receipt of the cancellation notice.

9. Capacity Constraints and Allocation: At all times during the Agreement, Novati will allocate manufacturing capacity, components, raw materials and parts, for manufacture of Products on an equitable basis consistent with its capabilities and prior contractual commitments. If Customer's forecast exceeds Novati's then current ability to supply Customer's Product, Novati and Customer will negotiate in good faith the terms to, if feasible, add the necessary capacity to meet the forecast at Customer's cost. Customer acknowledges that clean room space, equipment availability, purchase lead time and installation lead time may limit Novati's ability to support Customer's forecast. Customer acknowledges that Novati's obligations to other customers may affect Novati's ability to agree to Customer's capacity requests.

10. Customer Equipment: In the event Customer desires to install equipment at Novati premises for use in processing Customer Products, the parties shall separately negotiate and agree to such installation terms and conditions, including but not limited to the cost, timing, and logistics of the installation, as well as related ongoing costs, maintenance fees, rights, and responsibilities, limitations of use, liabilities and responsibilities for such Customer equipment, Depending upon the volume of production, Customer may be required to pay an additional Equipment Hosting fee. At Customer's expense, Customer equipment must be promptly removed and the premises restored to pre-use condition by the effective date of the termination, expiration, or cancellation of this Agreement. Hosting fees shall apply from the date work begins to install Customer equipment and shall continue until all the equipment is full removed and the space is restored so that other usage of the space may occur. Fees for installation or removal of Customer equipment will be determined by quote from licensed subcontractors of Novati's choosing along with a commercially reasonable project management fee.

11. Warranty: For a period of one year from the date of shipment, Novati warrants that Products shall be processed in compliance with mutually agreed procedures, the FMEA, and Critical Step Specifications; free of any defect in materials or workmanship above levels demonstrated in the Production Release Plan; and that Product shall be processed in a commercially reasonable manner consistent with industry standards. Expressly excluded is any warranty that Products shall meet other specifications, goals or requirements of Customer unless mutually agreed. Also expressly excluded is any warranty of Product wafer level test yield, Product packaged unit electrical yield, Product package unit physical yield or Product reliability unless mutually agreed. **NOVATI HEREBY EXPRESSLY DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

12. Warranty Exclusions: The above warranty shall not apply to any Products which, by someone other than Novati, have been subject to (1) accident, abuse, misuse, neglect, improper installation or packaging, repair or alteration, (2) improper testing or use contrary to any instructions given by Novati, (3) placement in an unsuitable physical or operating environment or improper storage or maintenance improperly by Customer or the Customer's end customer, (4) or caused to fail solely or in part as a result of any component, material, product or service supplied by Customer; or (5) any Products with a defect solely or in part caused by the defective Customer proprietary design or other fault in any property provided by Customer. The above warranty is also not applicable to Prototype or Engineering Sample Product or Products that are not Proven Products.

13. Warranty Claim Limitations: Under no circumstances will Novati be liable for warranty compensation greater than the fees paid to Novati for the Product returned. Novati will at it sole option; 1) process replacement Product and deliver to Customer, or 2) pay Customer the fees paid by Customer to Novati for the Product or portion thereof which is the subject of the claim.

14. Shipment: Title to Products provided by Novati passes to Customer upon receipt by Customer or its carrier at Novati's shipping dock, EXW (Incoterms 2010); At Customer's request, Novati will arrange for transportation at Customer's expense in accordance with standard industry practices. Novati shall have no responsibility or liability for the actions of any carrier or for delivery problems to or from Novati. Novati will package substrates for shipment and storage in accordance with standard industry commercial practice at no additional cost to Customer, however, Customer may specify additional packaging instructions subject to agreement by Novati, with Customer paying for such additional packaging. Nan- substrate deliverables are shipped in a format deemed most appropriate by Novati.

15. Product Inspection Rights: Customer will be deemed to have waived its rejection rights for nonconformity unless Customer notifies Novati in writing of any nonconformity within thirty (30) days after receipt ("Inspection Period"). During the Inspection Period, Customer may reject and return to Novati any Products that do not conform to mutually agreed procedures. Customer's written notification must specifically identify how the nonconforming Products vary or do not conform. Customer will make transportation arrangements pursuant to standard industry practice, and Novati will reimburse Customer for reasonable return expenses unless Novati in good faith contests the validity of Customer's rejection. Customer's sole and exclusive remedies for Products that fail to conform, unless Novati in good faith contests the validity of Customer's rejection, shall be at Novati's sole discretion:
(I) Novati will retain the non-conforming Products and will refund to Customer any amounts that Customer paid to Novati for such nonconforming Products; (2) Novati will rework the nonconforming Products once and will submit such reworked Products to Customer per the delivery dates agreed upon by the parties; or (3) Novati will replace the non-conforming Products; or (4) Customer accepts the wafers notwithstanding their nonconformity and pays Novati a mutually agreed upon percentage of the amount that Customer would have paid the Novati according to the order had such wafers conformed to the specifications. If the parties elect option two as a remedy and the Products do not meet specifications the second time they are delivered, Customer may reject and return them to Novati unless Novati in good faith contests the validity of Customer's rejection. If not contested, upon receipt Novati will retain the Products and Novati will refund any money Customer has paid for the non-conforming Products or replace the Products, at Novati's sole discretion.

16. New Product Introduction: Customer may request priority support for validation of a new Product on an existing Production Line or at Novati's sole option, for Prototype Product or Engineering Sample Product. Customer acknowledges that this support shall be subject to non-reoccurring engineering charges and expedite fees as defined in this Agreement.

17. Limitation on Experimentation and Development Holds: Customer may not plan nor execute experiments, nor development holds on Product Lots started on the Production Line. At customer request, limited by Customer otherwise meeting the Minimum Product Volume Commit, Customer may request Novati to convert in its entirety a Product Lot to development status. All previously completed steps as well as any yet to be completed steps will be invoiced to the Novati standard development terms defined in this Agreement or other applicable agreements between Customer and Novati. Any experimentation or development holds done on Product Lots by Customer without prior authorized by Novati will be subject, at Novati's sole discretion, to conversion to development status with the consequences noted above.

18. Limitations on Problem Lot Issues: If a Customer's Product Lot on a Production Line goes on Problem Lot hold three times as defined in Novati's standard operating procedure, after the 3rd hold, the Product Lot, at Novati sole option, may be scrapped at Novati's sole expense.

19. CHANGE PROCEDURES

19.1. Novati Requested Change Procedure: Where Novati wishes to make a change to the Production Line (a "Process Change") which potentially impacts form, fit, or function, Novati shall issue a process change notice (PCN), which PCN shall include sufficient details regarding the nature of the proposed change, the reason for the proposed change, details regarding its implementation, the impact of the change (including but not limited to scheduling and Fees) on any contractual commitment or releases, and the proposed implementation date of the engineering change.

19.2. Promptly after issuing the foregoing PCN, Novati shall, at its expense, provide Customer with a mutually agreed number of evaluation samples of the affected Product and other information requested by Customer to enable Customer to evaluate the change. Customer may, acting in its reasonable discretion, reject any Process Change Notification and shalt notify Novati in writing of such rejection within thirty (30) days of time from its receipt of such Product samples and other information. While Customer is considering a Process Change or if Customer rejects a Process Change, Novati shall continue to manufacture and supply the Product, in accordance with the terms of this Agreement, without the requested Process Change, however Novati may refuse to accept additional Product orders beyond the existing order at the time Novati delivers the PCN to Customer. Where Customer provides its written approval of the Process Change, Novati shall implement the change on a mutually agreed schedule.

20. Customer Requested Changes: Customer may, at Customer's expense, by written notice to Novati, amend Customer drawings or designs, Production Line details or the Specifications, at any time prior to the manufacture of the affected Products and provided Customer pays to Novati any reasonable non-recurring charges, if any, and/or revised Fees for such Products, as mutually agreed by the parties in writing, Novati shall implement such amendment within a period of time as mutually agreed by the parties upon validation through a Production Release Plan if necessary.

21. Additional Indemnity of Novati by Customer: Since the Products that are provided by Novati to Customer will by their nature, be further processed, transformed, tested, and integrated into Customer's products without the involvement or control of Novati, it is expressly agreed that Customer shall indemnify, defend, and held Novati harmless from all third party claims of death, personal injury, costs, or damages of any description, irrespective of any theory of liability including but not limited to negligence, strict or products liability, and whether or not third parties are customers of Customer, where such claims arise out of or are related to the Products provided to Customer by Novati pursuant to this Agreement. This indemnity is in addition to and is not in lieu of any other indemnity obligations in this Agreement and this indemnity shall be excluded from and not be subject to any limitation or cap on liability that may be elsewhere in this Agreement. The parties agree that this contractual indemnity shall apply notwithstanding any liability legally attributable to Novati and that this indemnity is intended to extend to all third party claims of any kind or character, whether fixed or contingent, known or unknown. The parties agree that this indemnity shall survive the completion, expiration and/or termination of the Agreement. The parties acknowledge that this indemnity was an essential element in this Agreement and that in the absence of this indemnity the pricing and other terms set forth in this Agreement would be substantially different.

22. Quality & Quality Assurance: Novati shall use commercially reasonable effort to manufacture the Products in accordance with the then-current, written manufacturing specifications, Novati's then-current Global Quality Management procedure, and any other mutually agreed quality requirements including, without limitation those in the FMEA.

[***AMEND462693-021*2*16814613805931674195361255735063225154189563504$*6*11***]

23. CAR: Where a non-conformance is identified, Customer may issue a corrective action requests ("CAR") to Novati. Novati shall notify Customer as soon as non-conformance identified in a CAR is corrected. Customer will use a CAR process to notify Novati of defective Products (i.e., those not conforming to applicable specifications) or degradation of established quality requirements. Novati will initiate appropriate actions to minimize the possibility that additional defective Products will be delivered to Customer. Within a commercially reasonable amount of time of CAR notification, Novati will notify Customer in writing of its initial analysis on the cause for the defect and the interim actions being taken to continue delivery of defect-free Products conforming to applicable specifications while analysis continues to determine root cause and a final corrective action plan. Novati will deliver a formal written response to the CAR (or a request for an extension) to Customer within 30 (thirty) business days after notice of the CAR from Customer. CAR responses must include (a) a root cause or methodology to arrive at root cause, (b) a containment plan, (c) a corrective action implementation date, and (d) any follow-on preventive action plans. Upon Customer's request, Novati will use commercially reasonable efforts to provide such additional support as needed to achieve full corrective action. All costs incurred for such additional support and other correction action shall be borne by Novati provided that the defect is one for which Novati is responsible under the warranty terms under Section 1L The above remedy will be in addition to any other rights and remedies Customer may have under this Agreement.

24. Production Line Control: Novati will manage the control of the Product on the Production Line used for Customer's Product as defined in Novati standard operating procedures.

25. Data Retention: Product traceability information will be retained by Novati per Novati's record retention policy but is at a minimum for 2 years.

26. Attachments:

The Schedule includes the following attachments which are incorporated by this reference: the initial FMEA, the SPC controls, the measurement plan, and the full customer process flow with agreed to performance specifications. [*NOTE: This Schedule and the attachments are to be added to an existing Customer MSA by formal written amendment.]*

[***AMEND462693-021*2*168148138050316741953612557350632251541895635048*11*11***]

NOVATI TECHNOLOGIES, INC.

BioNano Genomics
AMEND462693-018
Initials: Novati Customer: mB

This Amendment 21, ("Amendment"), dated March 31, 2017 ("Effective Date") is to the Master Services Agreement dated March 2, 2009 ("Agreement") between Novati Technologies, LLC ("Novati"), and BioNano Genomics ("Customer")• The Agreement mandates that all changes must be in a writing signed by the parties. Except as provided below, all the provisions of the Agreement shall remain in effect and apply to the amended language, Accordingly, the parties agree to the following:

1) Both parties agree to extend the expiration date of the Amendment 19 and the End Date of the Exhibit A, Commercial Quotation — Development Services from March 31, 2017 to March 31, 2018.

Effect of this Amendment: In the event of any conflict between the Agreement and this Amendment, this Amendment shall control. Except as amended or as otherwise set forth in this Amendment, the Agreement shall continue unchanged and in full force and effect in accordance with its terms.

LIST OF ATTACHMENTS: Following is a list of attachments to this Amendment, including all Schedules and Exhibits. Any future added attachment must include a dated Amendment or provision referencing the Agreement and must be executed by all parties.

None.

With due authority from our respective companies, we hereby signify our consent to this Agreement by signing below,

Novati Technologies, Inc.

Signature: /s/ John R. Behnke

Printed Name: John R. Behnke
Title: CEO and President
Date: 4-26-2017

Customer: BioNano Genomics

Signature: /s/ Erik Holmlin

Printed Name: Erik Holmlin
Title: CEO
Date: April 25, 2017

2032297-4-1-1

["'AMEND462693-022'4'7200802027553260885812577033997056140355518903820'1'1'"']

This Amendment 22, ("Amendment"), dated March 31, 2018 ("Effective Date") is to the Master Services Agreement dated March 2, 2009 ("Agreement") between Novati Technologies, LLC ("Formerly Novati, now Skorpios"), and BioNano Genomics ("Customer")• The Agreement mandates that all changes must be in a writing signed by the parties. Except as provided below, all the provisions of the Agreement shall remain in effect and apply to the amended language, Accordingly, the parties agree to the following:

1) Both parties agree to extend the expiration date of the Amendment 19 and the End Date of the Exhibit A, Commercial Quotation — Development Services from March 31, 2018 to the earlier of March 31, 2019 or the execution of a […***…] between the parties for […***…].

Effect of this Amendment: In the event of any conflict between the Agreement and this Amendment, this Amendment shall control. Except as amended or as otherwise set forth in this Amendment, the Agreement shall continue unchanged and in full force and effect in accordance with its terms.

LIST OF ATTACHMENTS: Following is a list of attachments to this Amendment, including all Schedules and Exhibits. Any future added attachment must include a dated Amendment or provision referencing the Agreement and must be executed by all parties.

None.

With due authority from our respective companies, we hereby signify our consent to this Agreement by signing below,

Skorpios Technologies, Inc. (f/k/a Novati Technologies, LLC)

Signature: /s/ John Hamma

Printed Name: John Hamma
Title: SVP Foundry Services
Date: March 31, 2018

Customer: Bionano Genomics

Signature: /s/ Erik Holmlin

Printed Name: Erik Holmlin
Title: CEO
Date: March 31, 2018

CERTAIN INFORMATION CONTAINED IN THIS EXHIBIT, MARKED BY […*…], HAS BEEN EXCLUDED FROM THIS EXHIBIT BECAUSE THE REGISTRANT HAS DETERMINED THAT IT IS BOTH NOT MATERIAL AND IS THE TYPE THAT THE REGISTRANT TREATS AS PRIVATE OR CONFIDENTIAL.**

This AGREEMENT is entered into by **Paramit Corporation,** a California corporation (referred to in this agreement as "Paramit"), and the following party: **BioNano Genomics** (referred to in this agreement as "Customer").

Customer represents that it is a:

☒ Corporation ☐ Limited Liability Company ☐ Other:

Formed under the laws of:

☐ California ☒ Delaware ☐ Other:

1. RECITALS AND DEFINITIONS:

(a) From time to time, Paramit will quote a price to Customer for goods that Customer wants manufactured. Such quote is not a contractual offer or a contract, and such quote does not obligate Paramit to enter into any contract with Customer. When Customer wishes to engage Paramit to manufacture the goods based on Paramit's quote, Customer will issue its purchase order to Paramit.

(b) "Particular Purchase Order Terms" means the following terms in Customer's purchase order: the identification of the goods to be manufactured, Customer's specifications, the price per item of such goods, the quantity of goods that Paramit is to manufacture, the date or dates of shipment, and the "ship to" address. In the case of a purchase order for NREs, the term "Particular Purchase Order Terms" means the following terms in the Customer's purchase order: the identification of the NREs and the charge for the NREs.

(c) The issuance of a purchase order by Customer is an offer to enter into a contract between Customer and Paramit for the manufacture and sale of goods on the terms of this agreement and the Particular Purchase Order Terms. Paramit may accept Customer's purchase order only by: (1) beginning manufacture of goods for Customer, which includes ordering materials, whether or not notice of acceptance is sent by Paramit, or (2) a written notice of acceptance signed by the program manager assigned to Customer by Paramit, whether or not Paramit begins manufacture. If Paramit accepts Customer's purchase order, the contract between Customer and Paramit for the manufacture of goods consists of the terms of this agreement as supplemented by the Particular Purchase Order Terms contained in that purchase order. Agreed pricing is deemed to be fixed and determined as of the date of the purchase order. Any adjustments to pricing due to engineering changes and or material costs will be amortized over future shipments of product provided Customer issues updated purchase orders in a timely manner to eliminate further price delta. No retro-active adjustments will be made to Products already shipped and invoiced. The terms and conditions of Customer's purchase order other than the Particular Purchase Order Terms are not part of any contract between Paramit and Customer.

(d) If more than one product is to be manufactured by Paramit for Customer, there is a separate contract between Paramit and Customer for each such product. The terms of each contract consist of the terms of this agreement as

supplemented by the Particular Purchase Order Terms for that product set forth in a purchase order accepted by Paramit. For example, if Customer issues a purchase order for product A and another one for product 8 and Paramit accepts each purchase order, there are two separate contracts: one for product A on the terms of this

agreement as supplemented by the Particular Purchase Order Terms set forth in a purchase order accepted by Paramit for product A, and one for product B on the terms of this agreement as supplemented by the Particular Purchase Order Terms set forth in a purchase order accepted by Paramit for product B. If Customer issues a revised purchase order for a product, or if Customer issues a purchase order for NRE's associated with a product, and Paramit accepts the purchase order, that purchase order is an amendment to the contract for that product to the extent of the Particular Purchase Order Terms contained in that purchase order.

(e) The term "product" means the goods identified in a purchase order from Customer that has been accepted by Paramit.

(f) The term "Customer's Specifications" means Customer's specifications that are in effect at the time of Paramit's commencement of manufacture of a product and that have been accepted by Paramit. If Customer provides specifications to Paramit for packaging the product and Paramit agrees to provide packaging in accordance with such specifications, "Customer's Specifications" includes such packaging specifications.

(g) The term "inventory" refers to work in process (if any) and to finished goods (if any) but not to materials.

(h) The term "materials" refers to goods of the type listed on Customer's bill of materials. By way of example, materials include resistors, capacitors, coils, integrated circuits, BGA's, FPGA's, power supplies, printed circuit boards, sheet metal, plastics, cases, fasteners, labels, cabling, connectors, grommets, and customer-specified packaging.

(i) The term "NREs" means non-recurring expenses associated with a product, and include tooling, stencils, test fixtures, and test programs.

(j) As used in this agreement, the word "include" and its variants are used to illustrate and not to limit. Thus, the word "including" means "including (but not limited to),"

2. BASIC AGREEMENT.

(a) Paramit agrees to manufacture and sell, and Customer agrees to buy and pay for, the product on the terms set forth in this agreement and the Particular Purchase Order Terms for the product.

(b) Subject to the limitations set forth in this agreement, Paramit warrants to Customer that: (1) product will be manufactured in accordance with Customer's Specifications. (2) product will be manufactured in accordance with IPC-A-610, Acceptability of Electronic Assemblies, Class 3 standards in effect at the time of manufacture unless otherwise specified in Customer's specifications.

(c) This agreement does not obligate Customer to issue any purchase orders to Paramit. Paramit is not required to accept any purchase order from Customer. This agreement applies only to the extent Customer issues purchase orders that Paramit accepts.

3. PRODUCT ACCEPTANCE.

(a) During the acceptance period for a product, Customer may inspect and test the product with the same identical test that is provided to Paramit for manufacture of product and may reject any

product found not to conform to Customer's specifications or to be defective in materials or workmanship. The acceptance period for a product is a period of […***…], beginning with receipt of the product by Customer. Products not rejected during the acceptance period are accepted; however, should failure(s) occur after acceptance but during the warranty period, product will be covered with warranty remedies outlined in this Agreement.

(b) To reject a product, Customer must give to Paramit written notice during the acceptance period in accordance with Exhibit A, REPAIR/ UPGRADE TERMS AND CONDITIONS. The notice must specify the nonconformity or defect. Customer shall obtain a return material authorization (RMA) number from Paramit, properly pack the product for shipping, display the RMA number on the shipping container, and ship the nonconforming or defective product to Paramit, which Customer may do freight collect. Paramit will promptly repair or replace rejected product, at Paramit's option, and will deliver the repaired or replaced product freight pre-paid. If Paramit is unable to make the repair or replacement within a commercially reasonable period of time, Paramit will refund the price paid for such product or cancel the obligation to pay for such product.

(c) The provisions of this paragraph apply to the repaired or replaced product (for which there will be a like acceptance period and a like procedure for defects). Thus, if a product is rejected because of a defect and Paramit provides a replacement product, the acceptance period for the replacement product will start with Customer's receipt of the replacement product.

(d) If Customer rejects product and returns it to Paramit under this section, but the product conforms to Customer's Specifications and there is no defect, Customer will bear all the risk and expense associated with the return, including shipping expense both ways, plus Paramit's customary charges for testing.

4. REPAIR AND REPLACEMENT AFTER ACCEPTANCE.

(a) If any product has a defect in workmanship that manifests itself after Paramit's shipment of the product and before the first anniversary of the date of such shipment, Paramit will repair or replace the product as defined in Exhibit A, and Paramit will pay for the shipping to return the product to Paramit and to re-send the repaired or replaced product to Customer. If Paramit is unable to repair or replace such product within a commercially reasonable period of time, Paramit will refund the price paid for such product. Paramit's obligation to repair or replace the product (or to refund the price) is conditioned on Customer's making a claim in writing to Paramit no later than the first anniversary of the date of the shipment of the product. Paramit has no obligation with respect to a defect in workmanship that manifests itself after the first anniversary of the date of Paramit's shipment of the product. The obligations set forth in this paragraph are Paramit's sole and exclusive obligations with respect to a defect in workmanship.

(b) Defects in materials will be covered by their respective manufacturers' warranties. Customer will pay for shipping the product to Paramit and back to Customer. If Paramit is unable to repair or replace such product within a commercially reasonable period of time, Paramit will refund the price paid for such product. Paramit's obligation to repair or replace (or to refund the price) is conditioned on Customer's making a claim in writing to Paramit no later than […***…] after the defect in materials first manifests itself or […***…] after the date of shipment, whichever comes first. Paramit has no obligation with respect to a defect in materials that manifest itself after the expiration of the component manufacturer warranty period. The foregoing warranty does not apply

to materials supplied to Paramit by or at the direction of Customer. The obligations set forth in this paragraph are Paramit's sole and exclusive obligations with respect to a defect in materials. Upon request, Paramit will assign to Customer rights under warranties made by suppliers of materials that are used.in the product.

(c) Customer may, at its option, issue a written Corrective Action Request (CAR) to Paramit. If Customer issues a CAR, Paramit shall acknowledge receipt of the CAR no later than the close of business the next business day. Paramit's response to a CAR shall be organized in a mutually agreeable format. Within […***…] from the receipt of a CAR, Paramit shall develop and submit to Customer a plan to identify and solve the root cause for nonconformity to Customer's specifications or for product defects.

(d) Any item under warranty is covered in accordance with section 4; Customer shall not reverse or short pay invoices for returned items, as this will create accounting issues.

(e) Customer to notify Paramit in advance of returning any products that may have been contaminated with hazardous materials. Customer to decontaminate all internal & external sections of products destined to return to Paramit, including tubes, waste tanks and other similar hazardous material pathways and remove all fluid and solid substances, as well as disposable parts from the device prior to return to Paramit. Customer to provide product identification information such as device serial number at the time of requesting RMA number.

(1) Customer shall not return any instruments to Paramit that may be contaminated with viable biological agents, harmful quantities of hazardous chemicals, or radioactive materials. Customer understands and agrees that decontamination is critical to issues of health and safety. Customer represents and warrants to Paramit to perform and complete all decontamination requirements prior to returning any such product to Paramit.

(2) Customer hereby assumes all responsibility and liability for, and shall defend and indemnify Paramit against injury or damage incurred by Paramit and its employees, contractors, and/or agents that result directly or indirectly from the Customer's breach of this representation and warranty.

(3) Customer accepts that Paramit Corporation has no obligation to repair, service, or transport any product if it is determined that the product is contaminated.

(4) Customer shall comply with all applicable laws and regulations when returning any product to Paramit under this Agreement.

5. ADDITIONAL WARRANTY MATIERS.

(a) Subject to the limitations set forth in this agreement, Paramit warrants to Customer that:

(1) Title to each product will be good and transfer of title to Customer will be rightful. The foregoing warranty does not apply to materials supplied to Paramit by, or at the direction of, the Customer.

(2) Each product will be delivered free from any security interest or other encumbrance created by Paramit. The foregoing warranty does not apply to any security interest in favor of Paramit to secure an obligation of Customer to Paramit.

(3) Paramit will not infringe any patent, copyright, trade secret, trade-mark, maskwork, or other intellectual property right of a third party in manufacturing the product. The foregoing warranty does not apply to any claim that is based, in whole or in part, on Paramit's compliance with Customer's Specifications.

(b) Any warranty by Paramit against defects (whether set forth in this section, another section, or implied by law) and any obligation by Paramit to repair or replace product (or to refund the purchase price) does not apply to the following:

(1) Defects resulting from compliance with Customer's Specifications.

(2) Defects resulting from use of Customer-provided test equipment or Customer-provided test software.

(3) Any product that has been misused, damaged, or altered after shipment or that is damaged in shipping. Misuse includes improperly handling static-sensitive electronic devices or an attempt by Customer or a third party to repair the product.

(4) Materials consigned, supplied by, or purchased at the direction of Customer.

(c) Paramit has no responsibility if Customer's specifications fail to comply with any governmental regulation or industrial specification, or if the product manufactured to Customer's specifications fails to meet the requirements of Customer's customer or the end user.

(d) THE WARRANTIES MADE BY PARAMIT IN THIS AGREEMENT ARE THE SOLE AND EXCLUSIVE WARRANTIES OF PARAMIT. PARAMIT DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. PARAMIT HAS NO LIABILITY TO CUSTOMER FOR ANY ACTIVE OR PASSIVE NEGLIGENCE ON PARAMIT'S PART IN THE MANUFACTURE OF PRODUCTS OR THE PROVISION OF SERVICES RELATING TO PRODUCTS.

6. CUSTOMER'S OPTION TO CANCEL OR MODIFY ORDER.

(a) On the terms set forth in this section and by giving Paramit more than […***…] written notice, Customer may cancel a purchase order for product or reduce the number of units of product in a purchase order. Other than for PCBA's, Customer may not cancel any deliveries scheduled for the […***…] period following Customer's giving such written notice to Paramit.

(b) A reduction in the number of units of product in a purchase order is a modification of the purchase order. Customer may modify a purchase order other than by reducing the number of units of product only if Paramit accepts the modification. An engineering change order issued by Customer and accepted by Paramit is a modification of the purchase order for the product.

(c) If Paramit receives notice of cancellation or modification of a purchase order before Paramit orders any materials or incurs any expense for NRE's, Customer may cancel or modify its purchase order without liability or charge.

(d) If Customer cancels or modifies a purchase order after Paramit orders any materials or incurs any expense for NRE's:

(1) Some or all the materials on hand or on order may thereby become Excess Materials. Customer will purchase all Excess Materials as set forth in section 7 of this agreement.

(2) Inventory of product on hand (including work in process) may become excess inventory. Customer will purchase all excess inventory in accordance with section 8 of this agreement.

(3) Customer will pay Paramit for that portion of the expense of the NRE's that has been incurred at the time Paramit receives notice of cancellation or modification.

(4) In the case of a complete cancellation of an order or in the case of a reduction in the number of units of product, Customer will pay Paramit a cancellation fee equal to […***…] of the price set forth in the purchase order for the units of the product that have been cancelled. Pursuant to section 9, the cancellation fee may be reduced or waived if the purchase order is a Blanket PO.

(e) If Customer cancels or modifies a purchase order and there is work in process, Customer should specify in the notice of cancellation or modification whether Paramit should complete work in process or stop work. If Customer fails to so specify, Paramit may complete work in process or stop work as Paramit sees fit.

(f) Customer has no liability to Paramit for cancelling or modifying a purchase order beyond what is set forth in this section.

7. LIABILITY FOR EXCESS MATERIALS.

(a) Customer acknowledges that the cost of materials ordered or purchased by Paramit, but not used or consumed in the manufacture of product, is to be borne by Customer. Customer acknowledges that such cost has not been included in Paramit's quote to Customer and is not reflected in the price of the product.

(b) Once a month, Paramit will review Customer's purchase orders and the materials on hand and on order that Paramit has allocated to manufacturing the product. If Paramit determines that it will not use or consume such materials for product that will be shipped within […***…] of Paramit's review, those materials that Paramit determines that it will not so use or consume are referred to in this agreement as "Excess Materials." Paramit's determination of excess materials made in good faith is conclusive and binding on Customer. Customer will purchase excess materials from Paramit on request.

(c) Customer acknowledges that Paramit may order or purchase more materials to manufacture the product than will be used or consumed in the manufacture of the product, which can result in excess materials that Customer must purchase. For example, Paramit may have ordered more materials than are required to manufacture the product because of:

(1) Minimum order quantity or the package size for the materials (e.g., a package contains 12 parts and an order for 100 products requires 9 packages of parts).

(2) Parts come on reels or tapes (which are entirely non-returnable once the reel or tape has been broken).

(3) Safety stock required by Customer.

(4) Customer's engineering change order, order reduction, or order cancellation may make materials obsolete, which will immediately result in such materials becoming excess materials.

(d) The term "Materials Cost" means the amount paid or payable (including freight, insurance, and sales or use tax) by Paramit to its suppliers for materials used or to be used for the product. Materials ordered pursuant to orders that are non-cancelable are part of excess materials. The term "Materials Cost" also includes restocking fees, freight, cancellation fees, and other charges by third parties associated with Paramit's returning materials or cancelling orders for materials as well as any third-party fees or charges associated with disposing of materials that Paramit disposes on behalf of Customer.

(e) When Customer is obligated to purchase excess materials, Customer will pay Pramit an amount equal to the materials cost for such excess materials plus an amount equal to […***…] of such materials cost ("Excess Materials Purchase Price").

(f) Supplier will use commercially reasonable efforts to mitigate Customer's liability for excess materials to the extent allowed by suppliers or vendors but any imposed limitations on such mitigations will not reduce Customer's liability for excess materials that have resulted from quantity reductions or cancellation. Where feasible, Paramit will:

(1) Reallocate materials that are part of excess materials to other Paramit jobs that, in Paramit's sole discretion, could use such materials. In that event, Customer will have no liability to Paramit for the materials so reallocated. Customer acknowledges that materials that are custom-made for Customer will not be reallocated to other Paramit jobs and will constitute excess materials.

(2) Return materials that are part of excess materials to Paramit's suppliers to the extent permitted by the suppliers.

(3) Cancel orders for materials that are part of excess materials to the extent that orders are cancelable. Customer acknowledges that orders for materials that are custom for Customer are non-cancelable and such orders will be part of excess materials. Customer acknowledges that orders for materials that are not custom for Customer may none the less be non-cancelable and in that case such orders will be part of excess materials.

(g) Within […***…] of Paramit's requesting Customer to purchase the excess materials and notifying Customer of the nature of the excess materials and the excess materials purchase price, Customer will issue its purchase order to purchase the excess materials for the excess materials purchase price. Payment terms are […***…].

(h) After the Customer has paid the excess materials purchase price, then, if Customer so requests, Paramit will deliver the excess materials to Customer at Customer's expense. If Customer does not wish to take delivery of the excess materials, or if Customer fails to pay in a timely manner the excess materials purchase price, Paramit will store the excess materials for a period not to exceed […***…] from the date payment of the excess materials purchase price was due. All risk of loss to excess materials, whether shipped or stored by Paramit, will be borne by Customer. If Paramit notifies Customer to pick up excess materials being stored by Paramit and Customer fails to do so within […***…] of such notification, Paramit is permitted to destroy or otherwise dispose of the excess materials, but any such destruction or disposition shall have no effect on Customer's liability for the excess materials purchase price or entitle Customer to any refund. Customer will pay Paramit a storage fee equal to […***…] of the excess materials purchase price for each month (or part thereof) that Paramit stores the excess materials after the date payment of the excess materials purchase price was due.

8. LIABILITY FOR EXCESS INVENTORY.

(a) Customer acknowledges that Paramit's pricing of the product is based on shipping product promptly after manufacture and being paid in a timely manner.

(b) Once a month, Paramit will review Customer's purchase orders and the product inventory (both finished goods and work in process) that Paramit has on hand. If Paramit determines that Paramit has product inventory on hand that Paramit will not ship within […***…] of Paramit's review, that portion of the product inventory on hand that Paramit determines that it will not so ship is referred to in this agreement as "Excess Inventory." Customer acknowledges that Customer's modification or cancellation of its purchase order may result in part or all the product inventory on hand not being shipped within […***…] of such modification or cancellation and thereby becoming excess inventory that Customer must purchase. Paramit's determination of excess inventory made in good faith is conclusive and binding on Customer. Customer will purchase excess inventory from Paramit on request.

(c) The term "excess inventory purchase price" means, with respect to excess inventory product that is finished goods, the price for the product set forth in the purchase order. The term "excess inventory purchase price" means, with respect to excess inventory product that is work in process, the price for the product set forth in the purchase order less the value of uncompleted work. The value of uncompleted work is the value of the test labor and assembly labor that have not been expended on the work in process. Paramit's determination made in good faith of the value of uncompleted work is conclusive and binding on Customer.

(d) Within […***…] of Paramit's requesting Customer to purchase the excess inventory and notifying Customer of the nature of the excess inventory and the excess inventory purchase price, Customer will issue its purchase order to purchase the excess inventory from Paramit for the excess inventory purchase price. Payment terms are […***…].

(e) After Customer has paid the excess inventory purchase price, then, if Customer so requests, Paramit will deliver the excess inventory to Customer at Customer's expense. If Customer does not wish to take delivery of the excess inventory, or if Customer fails to pay timely the excess inventory purchase price, Paramit will store the excess inventory for a period not to exceed […***…] from the date the excess inventory purchase price was due. All risk of loss to excess inventory, whether shipped or stored by Paramit, will be borne by Customer. If Paramit notifies Customer to pick up excess inventory being stored by Paramit and Customer fails to do so within […***…] of such notification, Paramit is permitted to destroy or otherwise dispose of the excess inventory, but any such destruction or disposition shall have no effect on Customer's liability for the excess inventory purchase price or entitle Customer to any refund. Customer will pay Paramit a storage fee equal to […***…] of the excess inventory purchase price for each month (or part thereof) that Paramit stores the excess inventory after the date the excess inventory purchase price was due.

9. BLANKET P.O.

Blanket PO means a purchase order that has rolling […***…] demand of product(s) and spare parts (if applicable). Such demand will indicate monthly quantities of required products to be shipped to Customer. As first month demand expires, Customer will add new demand to the […***…] of rolling demand window and update Blanket PO accordingly. Customer will issue "Blanket PO" to Paramit. Paramit will provide Blanket PO demand to suppliers to minimize risk factors but will procure materials per lead time and minimum order quantity (MOQ).

10. ORDER FLEXIBILITY

(a) Paramit welcomes increases in orders and or requests for earlier deliveries. Paramit will make reasonable efforts to accommodate such changes. Paramit will promptly investigate lead times, component availability, and possible expediting fees imposed by vendors (or other third parties) and will advise Customer of feasible delivery dates and increased costs, if any. The parties will negotiate an agreement for the increased number of units of product or accelerated delivery dates based on then prevailing market conditions, including lead times, component availability, and expediting fees. In negotiating such an agreement, Paramit will not seek to increase the price of the product except to pass through to Customer increases in materials costs, including any expediting fees and overtime charges for after hours or weekend work requests.

(b) Customer may defer delivery of product as follows but will accept material liability for parts that are purchased but cannot be cancelled or rescheduled:

Number of days prior to delivery date scheduled in the PO	% of quantities allowed to push out	Days allowed to push out
[…***…]	[…***…]	[…***…]
[…***…]	[…***…]	[…***…]
[…***…]	[…***…]	[…***…]
[…***…]	[…***…]	[…***…]

If delivery of units of product is deferred as permitted in this subsection, no further deferral of delivery of those units of product is permitted, but Customer may defer delivery of other units of product whose delivery has not been previously deferred.

(c) In the event that any build schedule for issued Purchase Orders are placed on hold by Customer, exceeding […***…], (a) Paramit will invoice overhead and profit portion of product price for the quantities of products put on hold. The invoice amount will be […***…] for affected quantities. This amount will be credited back to Customer upon resumption of product shipment; (b) Paramit will charge Customer a fee of […***…] per month to maintain an engaged customer focus team (CFT), supporting any required data analysis, failure analysis, design of experiments, change implementation, collaboration with suppliers and or Customer's engineering and quality; such CFT engagement fee is NRE and will not be credited back to Customer, once production resumes.

(d) If, after Paramit orders any materials or incurs any expense for NRE's, Customer reduces the number of units of product being purchased pursuant to a Blanket PO (or cancels the Blanket PO), the cancellation fee will be as set forth below (instead of the amount set forth in section 6(d)(4) of this agreement):

Number of days prior to delivery date scheduled in the Blanket PO	Cancellation fee
[…***…]	[…***…]
[…***…]	[…***…]
[…***…]	[…***…]
[…***…]	[…***…]

The cancellation fee is equal to […***…] set in the foregoing table […***…]. The calculation of the cancellation fee is based on the […***…]. The cancellation fee does not apply if the order is being cancelled or reduced by reason of being superseded by a new purchase order accepted by Paramit that does not result in excess materials or excess inventory. In addition to the cancellation fee, Customer is liable and will pay Paramit for any excess materials and excess inventory resulting from quantity reduction or cancellation; except for the cancellation fee, the Customer's liability for excess materials and excess inventory is calculated as set forth in sections 6, 7, and 8 of this agreement.

11. CONFIDENTIAL INFORMATION.

If Customer provides proprietary information to Paramit and designates in writing that the information is to be treated confidentially, Paramit will treat the information with the same care as it treats its own proprietary information of a similar nature, and Paramit will take commercially reasonable precautions to prevent unauthorized disclosure, including, when Paramit has agreed in another writing to do so, requiring written nondisclosure agreements of its employees and limiting access to the information to those employees with a need to know the information. This paragraph does not apply to information that Customer agrees may be released or to information that is published by Customer or others, or to information that is or becomes generally known to the public or within an industry through no fault of Paramit, or to information that Paramit can show was known by Paramit at the time of receipt, is independent developed by Paramit, or is provided to Paramit by a third party who has a right to provide such information. Paramit is permitted to comply with legal process that requires Paramit to disclose proprietary information. Paramit shall notify Customer promptly of the service of legal process, supplying Customer with a copy of the legal process.

(a) Similarly, Customer shall take commercially reasonable precautions to prevent disclosure of any information pertaining to Paramit's Intellectual Property (IP) and proprietary information, which is defined as any proprietary information, knowledge and know how that is conceived, created, written, put to practice, designed and developed by Paramit and, constructed through hardware and software, including data collection, extraction, manipulation, compilation, presentation and reporting tools; know how such as automated, computerized, audio-visual instruction, assembly, verification and validation develop in connection with manufacturing, such as […***…] and […***…].

12. INSURANCE.

Paramit agrees to maintain in effect the following types of insurance while manufacturing the product and while in possession of product inventory:

(a) Commercial general liability insurance with policy limits of $[…***…] for each occurrence and $[…***…] in the aggregate.

(b) Automobile liability with policy limits of $[…***…] for combined single limit.

(c) Workers' compensation insurance as required by law. Paramit will provide evidence of insurance on request.

13. PAYMENT TERMS.

(a) Payment terms are […***…]. The price of the product is F.O.B. Paramit's shipping dock (net of sales and use taxes, if any). All prices are in U.S. Dollars. Paramit will submit invoices to Customer upon shipment of the product. Each invoice will, at a minimum, refer to Customer's purchase order number, part number, unit price, and total price. If Customer does not object to an invoice within […***…] from the date of the invoice, it is deemed correct. Customer will pay Paramit in full no later than […***…] from the date of Paramit's invoice to Customer. If any sales or use tax applies to the sale or other disposition of product or materials or inventory, Customer will pay the tax. Customer acknowledges that sales tax may be incurred by scrapping materials or inventory.

(b) Customer agrees to […***…] to cover liability for excess materials and excess inventory based on reports from Paramit. Determination of actual excess amount, invoicing and payments for such excess materials shall be performed in accordance with section 7 and 8 of this Agreement.

(c) If Customer does not wish to take delivery of product, and if Paramit agrees, in its sole discretion, to bill and hold, Paramit will transfer the product to an area on Paramit's premises that is segregated from Paramit's manufacturing inventory. Upon such transfer, Customer will be liable to pay for the product as though it were delivered to Customer. Paramit will store the product for a period not to exceed […***…] from the date the product

would otherwise have been shipped. All risk of loss to such product will be borne by Customer. Customer will sign an acknowledgment in a form requested by Paramit that title to the product passes to Customer, risk of loss to the product passes to Customer, and Customer is liable for the purchase price notwithstanding that delivery has not been made to Customer's location.

(d) If Customer fails to pay an invoice within […***…] after payment is first due, Paramit may suspend work on the product for which payment is overdue. If Customer fails to pay an invoice within […***…] after payment is first due, Paramit may suspend work on all contracts with Customer and Customer shall be in breach of this agreement. Any sum owing to Paramit by Customer will bear interest at the rate of […***…] per month, compounded monthly, from the date due until paid. A breach of this agreement by Customer is a breach by Customer of each other agreement with Paramit.

(e) In the event of Customer's breach, Paramit is entitled to all remedies allowed by this agreement or by law. Among other things, Paramit may cancel all further obligations to Customer to manufacture or sell the product or to provide services.

14. ENGINEERING CHANGE ORDER (ECO) MANAGEMENT

To eliminate potential ambiguity, facilitating clear and effective ECO management, Paramit and Customer agree to the following steps:

(1) Customer provides complete engineering ECO package to Paramit.

(2) Paramit will review materials on hand, inventory, WIP, FGI, orders with suppliers, shipment schedules and provide impact analysis, which will also include any required WIP rework charges, if any.

(3) Customer accepts outcome of ECO impact analysis in writing, prior to ECO implementation.

(4) Upon receipt of written approval from Customer, Paramit will proceed with ECO implementation.

(5) Customer will provide updated product purchase order(s), reflecting new revision within […***…].

(6) Customer will issue PO for obsoleted components and required rework (if any) within a week of ECO impact analysis acceptance.

15. THIRD-PARTY PURCHASE ORDERS.

Customer may wish to designate a third party to purchase the product and to have such third party purchase the product directly from Paramit. Paramit will not accept a purchase order for product from a third party unless Customer makes a written request and by doing so, Customer accepts financial responsibility for the third party's obligations to Paramit.

16. GRANT OF MANUFACTURING RIGHTS.

(a) The grant of rights in this section only applies to the manufacture, use, and sale of product for which:

(1) The Customer has submitted a purchase order that has been accepted by Paramit or

(2) A third party has submitted a purchase order that has been accepted by Paramit at Customer's written request.

If the product, or any part thereof, is protected by patent owned and controlled by Customer, Customer grants Paramit the right to make, use, and sell any product protected by such a patent only to the extent necessary for Paramit to perform its obligations under this Agreement. If the product, or any part thereof, is protected by copyright, Customer grants Paramit the right to reproduce the copyrighted work, to prepare derivative copies based on the copyrighted work, to distribute copies of the copyrighted work, and to perform or display the copyrighted work only to the extent necessary for Paramit to perform its obligations under this Agreement. If the product or any part thereof, is protected by trademark, trade secret, or other intellectual property rights, Customer grants Paramit the right to make, use, and sell product that uses such intellectual property rights only to the extent necessary for Paramit to perform its obligations under this

Agreement. The grant of manufacturing rights will also extend to parts or components of the product that Paramit should order through sub-tier vendors, such as FAB, cable assemblies, sheet metals, plastics and other required custom parts.

(b) If Customer fails to pay Paramit as required by this agreement and Paramit is holding inventory of product, Paramit may use the rights granted in this section to complete work in process and to sell product to third parties.

(c) Customer represents and warrants that Customer has the right, power, and authority to grant such rights to Paramit.

17. LIMITATION ON LIABILITY.

In no event, whether as a result of breach of contract, breach of warranty, tort (including active or passive negligence), strict liability, product liability, or otherwise, shall Paramit be liable to Customer for any consequential or punitive damages of any kind, including loss of profits, loss of use, or interruption of business, whether or not Paramit was advised of the possibility of such damages. In no event shall Paramit's liability to the Customer, its successors or assigns under this agreement exceed Paramit's cost of materials for the specific quantity of Product(s) subject to the claims for liability hereunder. The statute of limitations for an action by Customer for breach of warranty or for other claim with respect to product is shortened to two years from the date of shipment of the product (i.e., an action must be filed before the second anniversary of the date of shipment).

18. INDEMNIFICATION.

Customer agrees to defend and indemnify Paramit and its employees against any liability (including attorney's fees, interest, and penalties), and to hold Paramit and its employees harmless against any loss or expense (including attorney's fees, interest, and penalties), arising out of a claim of a third party that is based on Paramit's compliance with Customer's specifications. The foregoing indemnification obligation applies to, among other things, any claim that the product infringes a patent, copyright, trade secret, trademark, maskwork, or other intellectual property right of.a third party, any claim that the manufacture, shipment, or use of the product violates any law, including a statute or regulation, and any claim that the product is unsafe or unreasonably dangerous or negligently caused personal injury or property damage.

19. FORCE MAJEURE.

A party to this agreement is excused from liability for non-performance or for delay in performance if such non-performance or delay is caused by a force beyond the reasonable control of the party and if such party is unable to overcome the effect of the force on non-performance or delay by the exercise of due diligence at reasonable cost. Such a force includes acts of God (including floods, tornadoes, windstorms, lightning, epidemics, earthquakes, and landslides), fires or explosions (whether or not caused by negligence of an employee of a party), strikes affecting the party or labor disputes affecting third parties (such as suppliers or freight companies), acts of war, terrorist acts, insurrection or civil disturbance, and governmental acts (such as seizures, quarantines, or embargoes). The foregoing applies whether the force affects a party to this agreement or a third party (such as a supplier or freight carrier). Financial inability of a party to perform, no matter what the cause of such inability, is not excused by this paragraph. A party claiming excuse under this paragraph shall promptly notify the other party of the force causing non-performance or delay and the probable duration.

20. MISCELLANEOUS.

(a) This agreement, including any exhibits to this agreement that are identified on the signature page to this agreement, along with the particular purchase order terms set forth in a purchase order accepted by Paramit, constitutes the final and complete expression of the agreement of the parties with respect to its subject matter. There are no promises, restrictions, representations, warranties, arrangements, or understandings other than those expressly set forth in this agreement. This agreement supersedes all terms on any purchase order related to the product concurrently or hereafter accepted by Paramit (including those for NRE's or for purchase of excess materials or excess inventory) except the particular purchase order terms. This agreement supersedes any prior negotiations, understandings, quotations, or agreements, whether written or oral, between the parties with respect to its subject matter and may not be contradicted by evidence of any prior or contemporaneous statements or agreements.

(b) This agreement may be amended only by a writing signed by the parties to this agreement.

(c) There are no conditions to the effectiveness of this agreement that are not expressed on the face of this agreement.

(d) The parties acknowledge that they have independently negotiated the provisions of this agreement, that they have relied upon their own counsel as to matters of law, and that neither party has relied on the other party with regard to such matters. This agreement shall be construed as a whole, according to its fair meaning, and without consideration as to which party drafted this agreement or any part of it. Civil Code §1654 shall not be applied to construe this agreement, and in the event of a dispute, no provision of this agreement shall be construed in favor of or against any party by reason of such party's contribution to the drafting of this agreement.

(e) Unless this agreement expressly provides otherwise, a reference in this agreement to "days" is a reference to calendar days and a reference in this agreement to a number of days is a reference to that number of consecutive calendar days. A "business day" is any day that is not a Saturday, Sunday, or other optional bank holiday listed in California Civil Code §7.1 except Good Friday. If the time for any act to be performed under this agreement falls on a day that is not a business day, the time for performing such act is extended to 5:00 P.M. of the first day following such time that is a business day.

(f) This agreement shall be governed by, and construed in accordance with, California law applicable to transactions taking place entirely within California and affecting solely California residents whether or not any part of this agreement is to be performed outside California and whether or not any party to this agreement is not a California resident.

(g) The parties may execute this agreement by signing one copy of this agreement or by signing duplicate copies of this agreement, and in the latter case, all of the signed copies will collectively constitute one and the same agreement, and each signed copy will be deemed an original. The parties may execute this agreement by one or more parties signing one counterpart of this agreement and one or more parties signing one or more other counterparts of this agreement, and the signed counterparts will collectively constitute one and the same agreement, and each signed counterpart will be deemed an original. Delivery by a party of the signature page to a counterpart of this agreement that has been signed by the party is the same as the party's delivery of a signed counterpart of this agreement. In proving this agreement when it has been executed in counterparts, a party must prove only that the party to be charged has signed a counterpart of the agreement. Delivery by facsimile transmission or by electronic transmission of an image of a signed counterpart of this agreement or an image of a signed signature page to this agreement is the same as delivery by hand of an identical document bearing an original ink signature.

(h) The captions of the sections and other headings contained in this agreement are for convenient reference only, and the words contained in such captions or headings do not control or affect the meaning of the provisions that follow.

(i) A waiver of any term or condition of this agreement in one or more instances shall not be construed as a general waiver by the party waiving the condition, who shall be free to insist on future compliance with such term or condition. A waiver of any provision of this agreement must be in writing and signed by the party to be charged with the waiver.

(j) Nothing in this agreement constitutes a partnership or joint venture between the parties hereto or constitutes any party the agent or employee of the other party for any purpose whatsoever. Neither party has authority to contract in the name of the other or otherwise to act to bind the other for any purpose.

(k) Except as this agreement may expressly provide otherwise, there are no third party beneficiaries of this agreement. The parties to this agreement may freely modify or rescind this agreement by an agreement signed by both parties without consent from any other person and without regard to the effect on any other party.

(I) In the event of any litigation by the parties to this agreement concerning this agreement or transactions under this agreement, the prevailing party shall be awarded all costs of litigation, including attorney's fees and charges for the preparation and trial of the action and for any appeals, expert witness fees, trial and appellate court costs, and deposition and trial transcript expense.

(m) Cost of materials and components are based on quote(s) provided to Customer and after acceptance via issuing PO for product(s), such materials costs will be entered into Paramit system as "standard cost". Subsequently, if any new part is added to the Bill of Material (BOM), Paramit will have to quote it by employing provided quantity usage at the time. Similarly, Paramit will purchase materials from Customer based on established "standard cost" and not necessarily the cost Customer might have paid for at higher volume than purchase orders placed with Paramit.

(n) Paramit may purchase Customer owned Materials/ Excess Materials, solely based on demand consumption rate of issued POs to Paramit and will pay Customer accordingly. Paramit would transfer Customer's usable, non-obsolete Materials / Excess Materials to a consigned warehouse, designated to Customer at Paramit; the consigned warehouse is netable against Materials Requirement Planning (MRP) and will prompt Paramit to use such Materials/ Excess Materials for any new demand. Paramit system will record transaction usage; Purchase Orders will be issued to Customer monthly.

(o) Customer to place spare orders at the same time as ordering products to prevent Price Purchase Variance (PPV) and shipment delays due to lead time issues. In the absence of a spares forecasting process, both parties agree to

develop such process. Paramit shall not be expected to sell Components that are designated for the manufacture of the products; as such requests may adversely affect product delivery dates and prevent Paramit from realizing planned revenue.

(p) For efforts leading to cost reductions, Paramit will […***…] after the implementation dates; Paramit and Customer will […***…]. Customer will receive […***…] thereafter. For savings to be realized, prior inventory purchased at higher price must be either used up or paid for by the Customer.

(q) Paramit takes Customer business seriously and allocates best resources to drive Customer initiatives; Customer and its agents shall not approach any Paramit personnel for recruitment, unless he/she had no longer been working for Paramit for […***…].

(r) Customer shall identify any hazardous materials on their BOMs or inform Paramit of such items, so that Paramit can take necessary measures to ensure the safety of personnel that will come in contact with such materials. Hazardous materials are materials that are radioactive, flammable, explosive, corrosive, oxidizing, asphyxiating, bio-hazardous, toxic, pathogenic, reagent, or allergenic as it pertains to state and local regulations, referencing CFR49 172.101 and CFR49 171.8.

IN WITNESS WHEREOF, the parties have signed and delivered the foregoing manufacturing service agreement between Paramit and Customer.

Paramit Corporation	**BioNano Genomics Inc.**
(*company name***)**	**(***company name***)**
Billoo Rataul	**Joel R. Jung**
(*print name of signature***)**	**(***print name of signature***)**
Chief Executive Officer	**Chief Financial Officer**
(*title of signatory***)**	**(***title of signatory***)**
/s/ Billoo S. Rataul	*/s/ Joel R. Jung*
(*Signature*)	(*Signature*)
February 18, 2015	Feb 18, 2015
(*date*)	(*date*)

Exhibits: A - REPAIR / UPGRADE TERMS AND CONDITIONS

Exhibits: A

REPAIR/ UPGRADE TERMS AND CONDITIONS

1. Customer will request RMA number via email or phone prior to sending any products to Paramit.
2. Customer will provide product part number, revision and detailed return reason of non conformance or defect for each unit.
3. Paramit will issue RMA number same day if request is received prior to 2:00; requests after 2:00 will be processed the next business day.
4. Warranty/ Out of Warranty
    (a) If product is returned due to manufacturing process defects or workmanship within […***…] of date of shipment, product will be repaired at no charge.
    (b) If product is returned for repair due to defective part that has no pass-through warranty from its manufacturer, Customer will be charged for the replacement part and associated labor. In case any part is covered under manufacturer's pass-through warranty, Customer will not be charged for such item; Paramit will work with supplier to activate warranty on behalf of the Customer. Paramit will buy parts per availability & lead time.
    (c) If product is returned for repair after expiration of warranty date, Customer will be charges for parts and labor.
    (d) If a product is returned to Paramit and is processed/ tested but no problem found (NPF), Customer will be charged for processing & testing.
    (e) For non warranty repair, Customer will issue PO at […***…]
        i. Paramit will provide estimated quote prior to repair
        ii. After repair is performed, Paramit will provide final repair charges
        iii. Customer will update […***…] PO per final repair/ upgrade charges prior to shipment.
        iv. Paramit will first try to validate failure; then, debug up to […***…]; any additional work beyond […***…] will require Customer's approval.
5. For Upgrade work, Customer will provide Acceptable Ship List (ASL). The ASL should clearly indicate allowable revision and or version for each product to ship.
6. For incoming products that are at lower revision, Paramit will upgrade to the most current revision if no specific direction is provided by the Customer. For upgrade instructions, there are two options:
    (a) Customer will provide upgrade instruction
    (b) Paramit could create upgrade instruction at a rate of […***…] / hr, as a onetime NRE charge but will require Customer to provide copies of all necessary ECO's. Once such instruction is created, it can be used for all subsequent incoming products that are at that revision.
7. For cosmetics, Paramit will inspect and assess condition of the product based on either cosmetic specifications provided by Customer or IPC standard. Paramit's manufacturing engineer will review and create required documents/ re-work instruction.

8. For high volumes of greater than […***…], flat fee charges could be established for products that require the same tests/ upgrades.
9. For PCBAs, if the repair cost will be greater than […***…] value of the board, Paramit will contact Customer to obtain authorization prior to performing any additional work. For systems, Paramit will seek Customer approval, if the repair cost is to exceed the mutually established cost threshold.
10. Repair turnaround time is […***…] from the day the product is received, provided the required components are available at Paramit and product will not exhibit multiple failures; otherwise, the component lead time will be added to the turnaround time and more time may be needed to root cause and repair the multiple failures. In such event, Paramit will inform Customer of delivery date.

Quote Details

Activity	**Cost**
Test / debug rate	[…***…]
Labor rate	[…***…]
Evaluation Fee	[…***…]
Validate Failure	[…***…]
Repair	[…***…]
Final Test	[…***…]
Final WA	[…***…]
Standard turnaround time	[…***…]
Expedite Charge	
3 day turn	[…***…]
4 day turn	[…***…]
5 day turn	[…***…]

* Requires Customer authorization if more debug time is required.

CERTAIN INFORMATION CONTAINED IN THIS EXHIBIT, MARKED BY [...*...], HAS BEEN EXCLUDED FROM THIS EXHIBIT BECAUSE THE REGISTRANT HAS DETERMINED THAT IT IS BOTH NOT MATERIAL AND IS THE TYPE THAT THE REGISTRANT TREATS AS PRIVATE OR CONFIDENTIAL.**

LICENSE AGREEMENT

BETWEEN PRINCETON UNIVERSITY AND

BIONANOMATRIX LLC

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LICENSE AGREEMENT
BETWEEN PRINCETON UNIVERSITY AND
BIONANOMATRIX LLC

THIS LICENSE AGREEMENT (this "Agreement") is made as of the 7th day of January, 2004 (the "Effective Date") by and between the Trustees of PRINCETON UNIVERSITY, a not-for-profit corporation duly organized and existing under the laws of the State of New Jersey, U.S.A. ("Princeton"), and BIONANOMATRIX LLC, a limited liability company duly organized and existing under the laws of the State of Delaware ("BioNanomatrix").

BACKGROUND

WHEREAS, certain inventions disclosed under […***…], generally characterized as […***…], […***…], […***…], and […***…] (collectively, the "Inventions") were made in the course of research at Princeton by the inventors listed on Exhibit A (the "Inventors");

WHEREAS, BioNanomatrix wishes to obtain certain rights from Princeton for the commercial development, manufacture, use and sale of the Inventions;

WHEREAS, Princeton is willing to grant certain rights and licenses with respect to the Inventions in accordance with the terms and conditions of this Agreement; and

WHEREAS, Princeton is desirous that the Inventions be developed and utilized to the fullest extent so that the benefits can be enjoyed by the general public.

NOW, THEREFORE, in consideration of the premises and mutual covenants contained herein, and intending to be legally bound hereby, the parties hereto agree as follows:

1. Definitions.

1.1 "Affiliate" means (i) any corporation or business entity that directly or indirectly controls, is controlled by, or is under common control with BioNanomatrix to the extent of at least 50% of the outstanding stock or other measure of voting rights with respect to the management of the corporation or business entity and (ii) any joint venture in which BioNanomatrix or an Affiliate participates that markets Licensed Products or Services.

1.2 "BioNanomatrix Improvement" shall mean any modification, enhancement or other improvement developed solely by BioNanomatrix, its employees, consultants or […***…], unless (a) all or part of the cost thereof is paid from Princeton funds or from funds administered by Princeton, (b) such modification, enhancement or improvement is made as a direct result of Princeton duties, or (c) such modification, enhancement or improvement has been developed in whole or in part through the utilization of Princeton resources (except as otherwise set forth in a written agreement between BioNanomatrix and Princeton or one of its facilities relating to the use of Princeton resources) in which case, such modification, enhancement or improvement shall be considered a Joint Improvement.

1.3 "Federal Government Interest" shall mean the rights of the United States Government and agencies thereof under Public Laws 96-517, 97-256 and 98-620, codified at 35 U.S.C. §§200-212, and any regulations issued thereunder, as such statute or regulations may be amended from time to time hereafter.

1.4 "Field of Use" shall mean all fields of use except for any claimed methods of creating or fabricating nano or microstructures by means of […***…].

1.5 "Inventions" shall mean the inventions covered by claims of the Princeton Patent Rights that are owned or controlled by Princeton and are listed on Exhibit A, and that are contained within the Field of Use.

1.6 "Joint Improvement" shall mean any modification, enhancement or other improvement relating to the Inventions developed jointly by both Princeton and BioNanomatrix inventors, as determined by U.S. patent law.

1.7 "Licensed Method" shall mean any process or method that is covered by the Princeton Patent Rights whose use or practice would constitute, but for the license granted to BioNanomatrix pursuant to this Agreement, an infringement of a Valid Claim of the Princeton Patent Rights.

1.8 "Licensed Product" shall mean any material or product or kit, or any process, or procedure that (1) would constitute, but for the license granted to BioNanomatrix pursuant to this Agreement, an infringement of a Valid Claim of the Princeton Patent Rights or (2) is developed, made, sold, registered, or practiced using Licensed Method or which may be used to practice the Licensed Method, in whole or in part.

1.9 "Net Sales" shall mean the total of […***…].

1.10 "Princeton Improvement" shall mean any modification, enhancement or other improvement to the Inventions developed solely by Princeton.

1.11 "Princeton Patent Rights" shall mean all rights embodied in PCT patent applications bearing serial nos. […***…], and U.S. patent application bearing serial no. […***…], corresponding U.S. and foreign patent applications or issued patents, including any provisionals, divisionals, continuations, reissues and extensions derived therefrom, such as patent term restorations, supplementary protection certificates, etc., to the foregoing that may be filed by or granted to Princeton during the term of this Agreement, to the fullest extent that Princeton currently has, or in the future is adjudicated by a court of competent jurisdiction to have, rights in the aforementioned PCT and U.S. patent applications.

1.12 "Services" means the use of the Licensed Product or Licensed Method to provide a service to an independent third party.

1.13 "Service Income" means the total of […***…].

1.14 "Sublicensee Income" means all […***…]; provided, that, Sublicensee Income shall not include: […***…].

1.15 "Territory" shall mean all countries of the world.

1.16 "Valid Claim" shall mean (i) a claim of an issued and unexpired patent included within the Princeton Patent Rights which has not been held invalid in a final decision of a court of competent jurisdiction from which no appeal may be taken, and which has not been disclaimed or admitted to be invalid or unenforceable through reissue or otherwise, or (ii) a claim of a pending patent application within the Princeton Patent Rights and for which not more than five (5) years has elapsed from the filing date to which the claim is entitled.

2. Grant of License.

2.1 Grant of License. Subject to Section 12.1 and the other limitations set forth in this Agreement and subject to the Federal Government Interest, if any, Princeton hereby grants to BioNanomatrix in the Territory a worldwide, exclusive right and license in the Field of Use under the Princeton Patent Rights to make, have made, use, have used, reproduce, sublicense, create and implement improvements, distribute, import, export, market, promote, offer to sell, sell, have sold, rent, and lease Licensed Products and Services, including, without limitation, the right to make, have made, further develop; improve, use, sell and distribute the Licensed Products and Services for all commercial, military and other applications and to practice the Licensed Method. For purposes of clarification, nothing contained in this Agreement shall prevent BioNanomatrix from utilizing any intellectual property of third parties, or any intellectual property developed by BioNanomatrix after the date hereof, relating to […***…], alone or in combination with the intellectual property rights granted under this Agreement.

It being expressly understood and acknowledged by BioNanomatrix that in so utilizing such intellectual property, it may be necessary to acquire rights to other Princeton patents or claims, including but not limited to those claiming […***…], that are not licensed herein. No implied license to such other Princeton patents, or claims, including but not limited to those claiming […***…], is implied, or conferred in this Section 2.1.

2.2 Limitation. Princeton agrees not to license, assign or otherwise transfer any portion of the Inventions in the Field of Use, except that Princeton retains the rights to use the Inventions for educational and internal research and development activities throughout Princeton, including the right to develop Princeton Improvements to the Inventions and apply for government grants relating thereto. For the avoidance of doubt, noting contained herein shall prevent Princeton from licensing to any third party any Princeton Patent Rights outside of the Field of Use.

2.3 Covenant not to Sue. BioNanomatrix hereby grants, and will cause its Affiliates, licensees and sub-licensees to grant, a limited covenant not to sue under the Princeton Patent Rights to one Princeton designee. The scope of the

covenant not to sue granted under the Princeton Patent Rights shall be limited to the use, manufacture, sell or offer for sale of […***…] machines, parts and accessories, and improvements to any of the preceding, that are covered by a Valid Claim of the Princeton Patent Rights. The parties agree that the initial Princeton designee shall be the […***…]. Princeton reserves the right to change the Princeton designee from time to time.

2.4 Notice Provision. Provided BioNanomatrix is in compliance with all of the terms under this Agreement and where Princeton is legally able, for a period of […***…] from the Effective Date, Princeton shall make a good faith effort to disclose to BioNanomatrix on a non-exclusive basis, non-confidential information of any Princeton Improvements to the Inventions within the Field of Use, made to Princeton within a reasonable time after it has been disclosed to Princeton.

3. Sublicensing.

3.1 Sublicense Grant. Princeton grants to BioNanomatrix the right to grant sublicenses to
third parties and Affiliates under the licenses granted in Sections 2.1 and 2.2. To the extent applicable, such sublicenses shall include all of the rights of and obligations due to Princeton (and, if applicable, to the United States Government) that are contained in this Agreement.

3.2 Notice. Within […***…] after execution thereof, BioNanomatrix shall provide Princeton with a copy of each sublicense issued hereunder, subject to any confidentiality obligations.

3.3 Continuation of Sublicenses. Upon termination of this Agreement for any reason and within […***…] of such termination, any sublicensee not then in default shall have the right to request in writing that its sublicense be assigned to Princeton. Such assignment shall be subject to Princeton's approval, such approval not to be unreasonably withheld. Additionally, Princeton shall in good-faith consider any reasonable request by a sublicensee for a modification of its obligations under the sublicense

4. Ownership. Subject to Section 12.1, Princeton shall have and retain all right, title and interest to the Inventions, subject to the license rights and Federal Government Interest set forth in Section 2.

4.1 Princeton Improvements. Princeton Improvements shall be owned by Princeton.

4.2 Joint Improvements. Joint Improvements shall be owned jointly by Princeton and BioNanomatrix and […***…].

4.3 BioNanomatrix Improvements. BioNanomatrix Improvements shall be owned by BioNanomatrix.

5. Due Diligence.

5.1 Commercially Reasonable Efforts. BioNanomatrix shall use commercially reasonable efforts to develop, test, obtain regulatory approval, manufacture, market and sell Licensed Products and shall earnestly and diligently endeavor to market the same within a reasonable time after execution of this Agreement and in quantities sufficient to meet the market demands therefore.

5.2 Judgment. BioNanomatrix shall be entitled to exercise prudent and reasonable business judgment in meeting its diligence obligations hereunder.

5.3 Governmental Approvals. BioNanomatrix shall use commercially reasonable efforts to obtain all necessary governmental approvals for the manufacture, use and sale of Licensed Products or Services.

5.4 Milestones.

(a) BioNanomatrix shall raise at least […***…] on or before […***…].

(b) BioNanomatrix shall have raised at least […***…] prior to […***…].

(c) BioNanomatrix shall prepare a full business plan suitable for distribution to additional investors by […***…].

(d) BioNanomatrix shall develop a […***…] incorporating at least a portion of the Princeton Patent Rights by […***…].

(e) BioNanomatrix shall identify a […***…] by […***…].

(f) BioNanomatrix shall achieve a first commercial sale of Licensed Products or Licensed Methods by […***…].

(g) BioNanomatrix shall achieve total sales of […***…] of at least […***…] during the calendar year ending […***…].

6. Payment Terms.

6.1 License Payment. BioNanomatrix agrees to pay to Princeton a license fee of […***…] (the "License Fee"). The License Fee shall be payable by BioNanomatrix in […***…]. In the event this Agreement is terminated by BioNanomatrix for any reason before […***…], then BioNanomatrix shall not be obligated to […***…]. The License Fee is […***…]. After payment of these amounts, there shall be no further payment obligations of BioNanomatrix except as set for the Sections 6.2 through 6.8.

6.2 License Maintenance Fee. BioNanomatrix agrees to pay to Princeton a license maintenance fee of […***…] beginning three years after the Effective Date, and continuing annually on the anniversary of the Effective Date each subsequent year (the "License Maintenance Fee"); provided that, beginning with the first commercial sale of a Licensed Product or Service, the License Maintenance Fee payable on any due date shall be reduced by the amount of any earned royalty paid to Princeton on sales of Licensed Product or Services during the preceding 12 month period. The License Maintenance Fee is […***…].

6.3 Sublicense Income. BioNanomatrix shall pay to Princeton […***…] of all Sublicense Income, to be paid in accordance with the schedule and conditions in Sections 6.5, 6.6(b), 6.7 and 6.8.

6.4 Royalties on Licensed Products. BioNanomatrix shall pay to Princeton a royalty of […***…] of Net Sales of Licensed Products, during the term of this Agreement. Sales among BioNanomatrix, its Affiliates and its sublicensees for ultimate third party use shall be disregarded for purposes of computing royalties. Royalties shall be payable only upon sales or transfers between unrelated third parties and shall be based on arms length consideration. Notwithstanding anything to the contrary contained herein, in the event that a Licensed Product is also covered by valid claim of a patent right or is also developed, made, sold, registered or practiced using a method licensed from Princeton pursuant to a separate agreement, then BioNanomatrix shall only be required to pay to Princeton […***…].

6.5 Royalties for Services. BioNanomatrix shall pay to Princeton a royalty of […***…] of Service Income, during the term of this Agreement. Sales among BioNanomatrix, its Affiliates and its sublicensees for ultimate third party use shall be disregarded for purposes of computing royalties. Royalties shall be payable only upon sales or transfers between unrelated third parties and shall be based on arms length consideration. Notwithstanding anything to the contrary contained herein, in the event that a Service is also covered by valid claim of a patent right or is also developed, made, sold, registered or practiced using a method licensed from Princeton pursuant to a separate agreement, then BioNanomatrix shall only be required to pay to Princeton […***…].

6.6 Third Party Payments.

(a) If BioNanomatrix, in order to make, use, sell or otherwise dispose of Licensed Products or Services in any jurisdiction, reasonably determines that it must make payments ("Third Party Payments") to one or more

independent third parties to obtain license or similar rights to make, use, sell or otherwise dispose of Licensed Products or Services in said jurisdiction, BioNanomatrix may reduce the future royalties due Princeton pursuant to Section 6.4 or 6.5 by the amount of […***…].

(b) In the event that any patent or any claim thereof included within the Princeton Patent Rights shall be held invalid in a final decision by a court of competent jurisdiction and last resort in any country and from which no appeal has or can be taken, all obligation to make Payments based on such patent or claim shall cease as of the date of such final decision with respect to such country. BioNanomatrix shall not, however, be relieved from paying any royalties that accrued before such claim was asserted or that are based on another patent or claim not involved in such decision.

6.7 Sales to the United States Government. If a license to the Invention has been granted to the United States Government, no royalties shall be payable hereunder on Licensed Products or Services sold to the United States Government. BioNanomatrix and its sublicensees shall […***…].

6.8 Payment.

(a) After […***…], the royalties payable to Princeton shall be made by BioNanomatrix to Princeton within […***…] during the term of this Agreement. After termination or expiration of this Agreement, a final payment shall be made by BioNanomatrix covering the whole or partial calendar quarter. Each quarterly payment shall be accompanied by a written statement of royalties as described in Section 6.9 hereunder.

(b) All payments shall be payable in United States Dollars in Princeton, New Jersey. When Licensed Products or Services are sold for monies other than United States Dollars, such amounts shall first be determined in the foreign currency of the country in which such Licensed Products or Services were sold and then converted into equivalent United States Dollars. The exchange rate will be the United States Dollar buying rate quoted in the Wall Street Journal on the last day of the applicable reporting period.

(c) In the event any amounts due Princeton hereunder, including […***…], are not received when due, BioNanomatrix shall pay to Princeton interest charges at a rate of […***…] per annum. Such interest shall be calculated from the date payment was due until actually received by Princeton.

6.9 Written Statement. Along with each remittance of payments to Princeton, BioNanomatrix shall include a report covering BioNanomatrix's most recently completed calendar quarter and will show the payments in U.S. Dollars with respect to Net Sales and sublicensing revenue. If no sales of Licensed Products or Services have been made during any reporting period, a statement to this effect shall be made by BioNanomatrix.

6.10 Books and Records; Audits. BioNanomatrix agrees to maintain and retain, in accordance with generally accepted accounting practices, complete and accurate records showing all transactions and information relating to this Agreement for a period of three years from the date of entry to which they pertain. Upon the written request of Princeton and not more than once in each calendar year, BioNanomatrix shall permit an independent certified public accounting firm (other than on a contingency fee basis) selected by Princeton and acceptable to BioNanomatrix (which acceptance by BioNanomatrix shall not be unreasonably withheld), to have access during normal business hours to such records of BioNanomatrix as may be reasonably necessary to verify BioNanomatrix's compliance with the payment terms of Section 6. The accounting firm shall enter into an acceptable and customary confidentiality agreement with BioNanomatrix obligating the accounting firm to retain in confidence all information of BioNanomatrix which it obtains in performing such audits hereunder, and such audit shall be subject to BioNanomatrix's third party confidentiality obligations. Any audit under this Section 6.10 shall be at the expense of Princeton, provided, however, if such audit reveals an underpayment by BioNanomatrix of more than […***…], the cost of such audit shall be paid by BioNanomatrix.

6.11 Taxes. BioNanomatrix shall be responsible for any and all taxes, fees, or other charges imposed by the government of any country outside the United States on the remittance of royalty income for sales occurring in any

such country other than income taxes due from Princeton. BioNanomatrix shall also be responsible for all bank transfer charges.

6.12 Reports. Beginning […***…], and annually thereafter, BioNanomatrix shall submit to Princeton a progress report covering BioNanomatrix's activities related to the development of all Licensed Products and Services. Such reports shall include sufficient information to enable Princeton to determine BioNanomatrix's progress in fulfilling its obligations under Section 5 hereunder.

7. Confidentiality.

7.1 Confidential Information. The parties understand and agree that in the performance of this Agreement each party may have access to proprietary or confidential data or information of the other party, including, but not limited to, trade secrets, intellectual property, services and/or the business, finances, or affairs of either party ("Confidential Information"). Confidential Information may be communicated orally, visually, in writing or in any other recorded or tangible form. All data and information shall be considered to be Confidential Information hereunder (i) if either party has marked them as such, (ii) if either party, orally or in writing, has advised the other party of their confidential nature, or (iii) if, due to their character or nature, a reasonable person in a like position and under like circumstances would treat them as confidential.

7.2 Disclosure of Confidential Information. During the term of this Agreement, either party may disclose certain Confidential Information (the "Disclosing Party") to the other party (the "Receiving Party") solely to permit the performance of obligations under this Agreement. The Receiving Party shall refrain from using, exploiting, or copying any and all Confidential Information for any purposes or activities other than those specifically authorized in this Agreement. The Receiving Party shall not disclose any Confidential Information to any third party, except to its employees, agents, representatives or sub-distributors as necessary for the performance of its obligations under this Agreement. Each party shall implement effective security procedures in order to avoid disclosure or misappropriation of the other party's Confidential Information. Each employee, agent or representative who will have access to any Confidential Information shall execute a reasonable nondisclosure agreement which prohibits the unauthorized use or disclosure of any of the Disclosing Party's Confidential Information. The Receiving Party shall immediately notify the Disclosing Party of any unauthorized disclosure or use of any Confidential Information by the Disclosing Party that comes to Receiving Party's attention and shall take all action that the Disclosing Party reasonably requests to prevent any further unauthorized use or disclosure thereof.

7.3 Exceptions. The provisions of this Section 7 will not apply, or will cease to apply, to Confidential Information supplied by the Disclosing Party that (i) was in the Receiving Party's possession prior to receipt from the Disclosing Party as shown by files existing at the time of disclosure, (ii) has come into the public domain other than through a breach of confidentiality by the Receiving Party, (iii) was developed independently by employees of the Receiving Party or by persons who have not had access to the Disclosing Party's Confidential Information, (iv) was or is lawfully obtained, directly or indirectly, by the Receiving Party from a third party under no obligation of confidentiality, or (v) is required to be disclosed pursuant to any statutory or regulatory provision or court order; provided, however, that the Receiving Party provides notice thereof to the Disclosing Party, together with the statutory or regulatory provision, or court order, on which such disclosure is based, as soon as practicable prior to such disclosure so that the Disclosing Party has the opportunity to obtain a protective order or take other protective measures as it may deem necessary with respect to such information.

7.4 Survival. The obligations of the parties under this Section 7 shall remain in effect for five (5) years from the date of termination or expiration of this Agreement.

8. Use of Names.

8.1 Use of Names. Nothing contained in this Agreement shall be construed as granting any right to the parties to use in advertising, publicity or other promotional activities any name, trade name, trademark or other designation of the other party (including contraction, abbreviation or simulation of any of the foregoing). Unless required by law, the

use by one party of the other party's name is expressly prohibited, and such party shall not use such names of the other party with such party's prior written consent.

9. Patent Prosecution and Maintenance.

9.1 Patent Filings for Inventions. Princeton shall diligently prosecute and maintain all United States and foreign patents comprising Princeton Patent Rights using counsel designated by BioNanomatrix, subject to Princeton's approval, not to be unreasonably withheld. Patent counsel shall take instructions only from Princeton, unless given permission by Princeton to take advice from BioNanomatrix; provided, however, that BioNanomatrix shall not be prohibited from contacting such patent counsel to participate in and provide comments on the filing, prosecution and maintenance of patents under Princeton Patent Rights. Princeton shall promptly deliver to BioNanomatrix, or have patent counsel deliver to BioNanomatrix, any communications with the applicable patent office, including without limitation, copies of all office actions and drafts of all proposed responses and any patentability search reports made by patent counsel, including patents located, a copy of each patent application, and each patent that issues thereon. It is the intent of the parties that all materials shall be provided to BioNanomatrix with appropriate lead time for BioNanomatrix to review and comment upon such materials prior to their submission to the applicable patent office.

9.2 Amendments. Princeton shall give due consideration to amending any patent application to include claims reasonably requested by BioNanomatrix to protect the Licensed Products and Services contemplated to be sold under this Agreement.

9.3 BioNanomatrix Improvements. At BioNanomatrix's cost and expense, BioNanomatrix shall file and prosecute on its own behalf any applications for patent rights relating to any BioNanomatrix Improvements after the Effective Date, and any patents issued on the BioNanomatrix Improvements shall be owned by BioNanomatrix and shall be in BioNanomatrix's name.

9.4 Initial Costs. BioNanomatrix shall pay Princeton […***…] relating to costs of preparing, filing, prosecuting and maintaining, the patent applications contained in the Princeton Patent Rights, including interferences and oppositions, and all corresponding foreign patent applications and patents incurred prior to the Effective Date (the "Initial Costs"). Such amount for the Initial Costs shall be due within […***…] of the Effective Date. Costs of preparing, filing, prosecuting, and maintaining all United States patent applications and/or patents, including interferences and oppositions, and all corresponding foreign patent applications and patents contained in the Princeton Patent Rights incurred after the Effective Date ("Future Costs") shall be paid by BioNanomatrix within […***…] of receipt of the invoice for such Future Costs. Failure to pay these bills in a timely manner is grounds for terminating the Agreement. After BioNanomatrix has been notified two times of failure to pay bills in a timely manner, Princeton may terminate the Agreement upon written notice to BioNanomatrix.

9.5 Foreign Applications. Princeton shall, at the request of BioNanomatrix, file, prosecute and maintain patent applications and patents covered by Princeton Patent Rights in foreign countries if available. BioNanomatrix consents to the filing of all PCT and foreign patent applications that have already been filed as of the Effective Date. If Princeton desires to file a patent application in any country or countries in which BioNanomatrix has not elected to secure patent rights, Princeton shall notify BioNanomatrix of Princeton's intention to file such application. BioNanomatrix shall have […***…] from the receipt of such notice to notify Princeton of BioNanomatrix's desire to have such patent application filed at BioNanomatrix's expense. If Princeton does not receive notice from BioNanomatrix within such 15-day period, Princeton may file such applications, at Princeton's sole cost and expense and the resultant patent applications, and resulting patents, shall not be subject to the license agreement.

9.6 Discontinuance. BioNanomatrix's obligation to pay Future Costs shall continue for so long as this Agreement remains in effect, provided, however, that BioNanomatrix may terminate its obligations with respect to any given patent application or patent upon three months' written notice to Princeton. Princeton shall use reasonable efforts to curtail Future Costs when such a notice is received from BioNanomatrix. BioNanomatrix shall promptly pay Future Costs that cannot be so curtailed. Commencing on the effective date of such notice, Princeton may continue prosecution and/or maintenance of such application(s) or patent(s) at its sole discretion and expense, and BioNanomatrix shall have no further right or licenses thereunder.

9.7 Recordation. If either Princeton or BioNanomatrix so requests in writing, the parties will promptly file and record with the United States Patent Office, and with any other applicable patent office or authority, a copy or memorandum of this Agreement and any other agreement granting BioNanomatrix rights in the Invention.

9.8 Cooperation. Each party shall cooperate with the other party to execute all lawful papers and instruments and to make all rightful oaths and declarations as may be necessary in the preparation and prosecution of all such patents and other applications and protections referred to in this Article.

10. Patent Marking.

10.1 Patent Marking. BioNanomatrix shall mark all Licensed Products made, used, sold or otherwise disposed of under the terms of this Agreement, or their containers, in accordance with the applicable patent marking laws.

11. Patent Infringement.

11.1 Infringement of Invention.

(a) In the event that Princeton or BioNanomatrix becomes aware of infringement of the Princeton Patent Rights, that party shall notify the other party in writing within thirty (30) days of becoming aware of such infringement. Any Licensee of the Princeton Patent Rights in other Fields of Use (a "Third-Party Licensee") will also be notified in writing by Princeton, subject to the exception set forth in Section 11.1(b) of this Agreement. However, in no event will the Third-Party Licensee be notified of any infringement prior to BioNanomatrix being notified of such infringement. Both parties agree that during the period after notification of infringement and prior to a decision to commence any legal action against the infringement, neither party will notify the infringing entity or person of the infringement of any of Princeton Patent Rights without first obtaining consent of the other party, which consent shall not be unreasonably denied. Both parties shall use commercially reasonable efforts in cooperation with each other to attempt to terminate such infringement without litigation. If Princeton is initially made aware of any infringement of the Princeton Patent Rights by a Third-Party Licensee and Princeton notifies BioNanomatrix of such infringement, BioNanomatrix agrees it will not notify the infringing entity or person of the infringement of any of Princeton Patent Rights and will use commercially reasonable efforts in cooperation with Princeton and any Third-Party Licensee to attempt to terminate such infringement without litigation.

(b) In the event that the Third-Party Licensee is the infringer or is materially involved in the infringement of the Princeton Patent Rights, Princeton shall not notify the Third-Party Licensee of the infringement without first obtaining consent of BioNanomatrix, which consent shall not be unreasonably denied. Furthermore, notwithstanding Section 11.1(c) of this Agreement, the Third-Party Licensee shall not be allowed to join Princeton or BioNanomatrix in any legal action taken against any infringement of the Princeton Patent Rights when the Third-Party Licensee is the infringer or is materially involved in the infringement of the Princeton Patent Rights.

(c) BioNanomatrix may request that Princeton take legal action against any infringement of Princeton Patent Rights, including, but not limited to, the filing of a temporary restraining order, a preliminary injunction and/or suit. In the event BioNanomatrix request the filing of a temporary restraining order and/or preliminary injunction, Princeton will make commercially reasonable efforts to evaluate such request within twenty (20) days of receipt. Such request shall be made in writing and shall include reasonable evidence of such infringement and damages to BioNanomatrix. If the infringing activity has not been abated within one hundred (100) days following the date of such request, Princeton shall have the right to

(i) commence suit on its own account; or
(ii) refuse to participate in such suit;

and Princeton shall give notice of its election in writing to BioNanomatrix by the end of the one-hundredth (100th) day after receiving notice of such request to take legal action from BioNanomatrix. If and only if Princeton elects not to commence suit for such infringement, BioNanomatrix may thereafter, but shall not be obligated to, bring suit for such infringement if the infringement occurred during a period and in a jurisdiction and in a Field of Use where

BioNanomatrix had exclusive rights under this Agreement. In the event BioNanomatrix elects to bring suit in accordance with this paragraph, the parties also acknowledge and agree that any Third- Party Licensee may also join in such a suit at its own expense, subject to the exception set forth in Section 11.1(b) of this Agreement, if the infringement occurred during a period and in a jurisdiction where the Third-Party Licensee had exclusive rights in the Princeton Patent Rights in other Fields of Use under a License Agreement with Princeton. Furthermore, in the event BioNanomatrix elects to bring suit in accordance with this paragraph, Princeton may thereafter join such suit at its own expense.

(d) Such legal action as is decided upon shall be at the expense of the party on account of whom suit is brought and all recoveries recovered thereby shall belong to such party, provided, however, that recoveries from legal actions brought jointly by Princeton and BioNanomatrix, or where any Third-Party Licensee is a party to the suit, shall be shared equally, after paying the reasonable legal expenses of the parties to the suit. The net recoveries shall be divided on a *pro-rata* basis among BioNanomatrix, Princeton and any Third-Party Licensee of the Princeton Patent Rights in other fields of use, after reimbursing the participating parties for their own respective reasonable out-of-pocket expenses, reasonable costs and reasonable legal feesIn the event that the suit is settled prior to a court determination or binding arbitration, Princeton, BioNanomatrix and any Third-Party Licensee shall divide the net recoveries equally, after reimbursing the participating parties for their own respective reasonable out-of-pocket expenses, reasonable costs and reasonable legal fees.

(e) Each party agrees to cooperate with the other in litigation proceedings instituted hereunder but at the expense of the party or parties bringing the litigation proceedings, on account of whom suit is brought. In the absence of a written agreement to the contrary, such litigation proceedings instituted hereunder shall be controlled by the party initiating the litigation proceeding. Each party may be represented by counsel of its choice at its own expense.

11.2 Infringement of Third Party Rights. BioNanomatrix shall have the right, but not the obligation, to defend against any claim, complaint, suit, proceeding or cause of action, brought against BioNanomatrix, which claims that use of the Inventions infringes any intellectual property right of any third party. Princeton agrees to (i) notify BioNanomatrix promptly in writing of any such claim, (ii) permit BioNanomatrix to defend, compromise or settle such claim solely at BioNanomatrix's discretion, and (iii) provide BioNanomatrix with reasonably available information and assistance regarding such claim. BioNanomatrix agrees to notify Princeton of any claim and reasonably update Princeton regarding the status of any such claim.

11.3 Cooperation. Each party agrees to cooperate with the other in litigation proceedings instituted hereunder but at the expense of the party on account of whom suit is brought. Such litigation shall be controlled by the party bringing the suit. Each party may be represented by counsel of its choice.

12. Limited Warranty.

12.1 Princeton Representations and Warranties. BioNanomatrix hereby acknowledges that the Princeton Patent Rights are currently the subject of litigation between third parties. BioNanomatrix further acknowledges that a third party may be the sole owner or the joint owner of all or certain portions of the Princeton Patent Rights and that Princeton may not have the right or ability to grant to BioNanomatrix an exclusive right and license in the Field of Use under the Princeton Patent Rights. In the event it is determined that Princeton has no right or ability to grant to BioNanomatrix an exclusive right and license in the Field of Use under the Princeton Patent Rights, BioNanomatrix's sole remedy against Princeton is the return by Princeton and any and all consideration, including, but not limited to, Initial Costs, Future Costs and the payments specified in Sections 5.1 and 5.2, received from BioNanomatrix for the grant of the license herein. BioNanomatrix waives any and all other damage claims against Princeton, its trustees, officers, agents and employees. Subject to foregoing, Princeton hereby represents and warrants to BioNanomatrix that:

(a) Princeton has the right to grant the licenses granted to BioNanomatrix under this Agreement;

(b) upon execution and delivery of this Agreement, BioNanomatrix shall have the exclusive right and license, except as set forth herein, to make, have made, use, sell, import and offer to sell the Inventions and the Licensed Products and Services under all of the Patent Rights;

(c) Princeton is the sole owner of the Inventions by assignment from the Inventors of their entire right, title and interest in the Inventions; and

(d) as of the Effective Date there are no known or pending claims or actions in which Princeton is a named party regarding the Inventions..

12.2 Disclaimer of Warranties. EXCEPT AS SET FORTH IN SECTION 12.1, THIS LICENSE AND THE ASSOCIATED INVENTIONS ARE PROVIDED WITHOUT WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED. PRINCETON MAKES NO REPRESENTATION OR WARRANTY THAT A LICENSED PRODUCT OR LICENSED METHOD WILL NOT INFRINGE ANY PATENT OR OTHER PROPRIETARY RIGHT.

12.3 Limitation of Liability. EXCEPT AS PROVIDED FOR IN SECTION 14.1, IN NO EVENT WILL EITHER PARTY BE LIABLE TO THE OTHER FOR ANY INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES RESULTING FROM EXERCISE OF THIS LICENSE OR MANUFACTURE, SALE, OR USE OF THE INVENTIONS OR LICENSED PRODUCTS OR LICENSED METHOD.

12.4 Further Disclaimer of Warranties. Nothing in this Agreement shall be construed as:

(a) a warranty or representation by Princeton as to the scope of any Princeton Patent Rights; or

(b) a warranty or representation that anything made, used, sold or otherwise disposed of under any license granted in this Agreement is or will be free from infringement of patents or other intellectual property of third parties; or

(c) an obligation to bring or prosecute actions or suits against third parties except as provided in Section 11; or

(d) conferring by implication, estoppel or otherwise any license or rights under any patents or other intellectual property of Princeton other than Princeton Patent Rights as defined herein, regardless of whether such patents are dominant or subordinate to Princeton Patent Rights; or

(e) an obligation to furnish any know-how not provided in the Princeton Patent Rights; it being understood that BioNanomatrix may use, in the Field of Use on a nonexclusive basis, all know-how owned or controlled by Princeton within the Princeton Patent Rights and within the Field of Use and possessed by its consultants and employees currently or previously employed by Princeton that is not covered by any other Princeton patent rights or to which Princeton does not owe a third party an exclusive right to use.

13. Term and Termination.

13.1 Term. Unless otherwise terminated by operation of law or by acts of the parties in accordance with the provisions of this Agreement, this Agreement shall be in full force and effect from the Effective Date and shall remain in effect in each country of the Territory until the later of (a) the last sale of a Licensed Product or Service or (b) the expiration of all of the Princeton Patent Rights.

13.2 Termination by BioNanomatrix. BioNanomatrix may terminate this Agreement at any time upon sixty (60) days written notice to Princeton.

13.3 Termination by Princeton. The failure by BioNanomatrix to comply with any of the material obligations contained in this Agreement shall entitle Princeton to give written notice to BioNanomatrix to have the default cured. If such default is not cured within sixty (60) days after the receipt of such notice, or diligent steps are not taken to cure if by its nature such default could not be cured within sixty (60) days, Princeton shall be entitled,

without prejudice to any of its other rights conferred on it by this Agreement, and in addition to any other remedies that may be available to it, to terminate this Agreement.

13.4 Survival of Obligations. The termination or expiration of this Agreement shall not relieve the parties of any obligations accruing prior to such termination, and any such termination shall be without prejudice to the rights of either party against the other. The provisions of Sections 4, 6.10, 7, 8, 12, 13, 14 and 15 shall survive any termination of this Agreement.

13.5 Section 365(n). BioNanomatrix and Princeton acknowledge that the rights granted to BioNanomatrix under this Agreement shall be considered "rights to intellectual property" under Section 365(n) of the United States Bankruptcy Act.

14. Indemnification; Insurance.

14.1 Indemnification by BioNanomatrix. BioNanomatrix will indemnify and hold harmless Princeton, its trustees, officers, agents and employees (collectively, the "Indemnified Parties"), from and against any and all liability, loss, damage, action, claim or expense suffered or incurred by the Indemnified Parties (including reasonable attorneys' fees) (individually, a "Liability" and collectively, the "Liabilities") which result from or arise out of the development, use, manufacture, promotion, sale, distribution or other disposition of any Licensed Products or Services by BioNanomatrix, its Affiliates, assignees, vendors or other third parties, including all claims for personal injury, including death, or property damage arising from any of the foregoing, except to the extent such claims result from the willful misconduct of the Indemnified Parties. This indemnification shall include, but not be limited to, any and all claims relating to products liability and any and all claims or suits for which either party is found to have been wholly or partially negligent.

14.2 Insurance. Before the first commercial sale of a Licensed Product or Service and thereafter, BioNanomatrix will maintain general liability insurance covering all claims, including products liability, which policy shall i) be in such form and amount of coverage and written by such company as is reasonable and customary in the industry but in no case less than $1,000,000 per occurrence, ii) provide that such policy is primary and not excess or contributory with regard to other insurance Princeton may have, iii) provide at least thirty (30) days' notice to Princeton of cancellation, and iv) include Princeton and Princeton's directors, officers and employees, as additional named insureds. BioNanomatrix will furnish Princeton, upon request, written confirmation issued by the insurer or any independent insurance agent confirming that insurance is maintained in accordance with the above requirements.

15. Miscellaneous Provisions.

15.1 Assignment. No rights under this Agreement may be assigned by either party without the express consent of the other; provided, however, BioNanomatrix may, upon prior notice to Princeton, sublicense, assign or otherwise transfer this Agreement, without Princeton's consent, to (i) a purchaser of all or substantially all of BioNanomatrix's stock or assets or the line of business to which the agreement relates, provided that such purchaser, agrees in writing to be bound by the terms of this Agreement.

15.2 Export Controls. It is understood that Princeton is subject to United States laws and regulations controlling the export of technical data, computer software, laboratory prototypes and other commodities (including the Arms Export Control Act, as amended, and the Export Administration Act of 1979), and that its obligations hereunder are contingent on compliance with applicable United States export laws and regulations. The transfer of certain technical data and commodities may require a license from the cognizant agency of the United States Government and/or written assurances by BioNanomatrix that BioNanomatrix shall not export data or commodities to certain foreign countries without prior approval of such agency. Princeton neither represents that a license shall not be required nor that, if required, it shall be issued.

15.3 Payment, Notices and Other Communications. Any notice or payment required to be given to either party shall be deemed to have been properly given and to be effective (a) on the date of delivery if delivered in person, (b) five (5) business days after mailing if mailed by first-class certified mail, postage paid and deposited in the United States

mail, or (c) the next business day if sent by recognized overnight courier, to the respective addresses given below, or to such other address as it shall designate by written notice given to the other party.

In the case of Princeton:

Office of Technology Licensing & Intellectual Property
Princeton University
4 New South Building, P.O. Box 36
Princeton, New Jersey 08544
Fax: (609) 258-1159
Phone: (609) 258-1570

In case of BioNanomatrix:

Han Cao, Ph.D.
1131 Great Road (PO Box 75)
Blawenburg, NJ 08504

With a copy to

Unus LLC
2800 Highland Court South
Birmingham, Alabama 35205
Fax: (205) 933-9668
Phone: (205) 933-9137

or to such other address or addresses as may from time to time be given in writing by either party to the other pursuant to the terms hereof.

15.4 Governing Law. This Agreement shall be construed, governed, interpreted and applied in accordance with the laws of the State of New Jersey, without giving effect to its choice of law provisions; except, however, that questions affecting the construction and effect of any patent shall be determined by the law of the country in which the patent was granted.

15.5 Entire Agreement. This Agreement and its Exhibits constitute and contain the entire understanding and agreement of the parties respecting the subject matter of this Agreement and cancels and supersedes any all prior negotiations, correspondence, understandings and agreements between the parties, whether oral or written, regarding such subject matter.

15.6 Further Actions. Each Party agrees to execute, acknowledge and deliver such further instruments and to do all such other acts as may be necessary or appropriate in order to carry out the purposes and intent of this Agreement.

15.7 Severability. If any provision of this Agreement becomes or is declared by a court of competent jurisdiction to be illegal, unenforceable or void, this Agreement shall continue in full force and effect without said provision, so long as the Agreement, taking into account said voided provision(s), continues to provide the parties with the same practical economic benefits as the Agreement containing said voided provision(s) did on the date of this Agreement. If, after taking into account said voided provision(s), the parties are unable to realize the practical economic benefit contemplated on the Effective Date, the parties shall negotiate in good faith to amend this Agreement to reestablish the practical economic benefit provided the parties on the Effective Date.

15.8 No Waiver. The failure of either party to assert a right hereunder or to insist upon compliance with any term or condition of this Agreement shall not constitute a waiver of that right or excuse a similar subsequent failure to perform any such term or condition by the other party.

15.9 Binding Effect. This Agreement shall be binding upon and inure to the benefit of the parties hereto and their respective heirs, successors and assigns, except that Princeton shall not have the right to delegate its obligations hereunder or to assign its rights hereunder or any interest herein without the prior written consent of BioNanomatrix.

15.10 Amendment. No amendment or modification hereof shall be valid or binding upon the parties unless made in writing and signed on behalf of each party.

15.11 Headings. The captions to the sections in this Agreement are not a part of this Agreement, and are included merely for convenience of reference only and shall not affect its meaning or interpretation.

15.12 Force Majeure. The failure of a party to perform any obligation under this Agreement by reason of acts of God, acts of governments, riots, wars, strikes, accidents or deficiencies in materials or transportation or other causes of a similar magnitude beyond its control shall not be deemed to be a breach of this Agreement.

15.13 Relationship of the Parties. Nothing contained in this Agreement is intended nor is to be construed so as to constitute Princeton or BioNanomatrix as partners or joint venturers with respect to any of the transactions or business activities described in this Agreement or to be undertaken by BioNanomatrix. Neither party shall have any express or implied right or authority to assume or create any obligations on behalf of or in the name of the other party or to bind the other party to any other contract, agreement, or undertaking with any third party.

Counterparts. This Agreement may be executed in any number of counterparts, all of which taken together shall constitute one and the same instrument, and any of the parties hereto may execute this Agreement by signing any such counterpart.

[SIGNATURE PAGE FOLLOWS]

IN WITNESS WHEREOF, the parties hereto have hereunto set their hands and seals and duly executed this License Agreement as of the Effective Date.

THE TRUSTEES OF PRINCETON UNIVERSITY

By: /s/ Michelle D. Christy
Name: Michelle D. Christy
Title: Director, Office of Research and Project Administration

BIONANOMATRIX LLC

By: /s/ Han Cao
Name: Dr. Han Cao, PhD.
Title: CEO

READ AND UNDERSTOOD

By: /s/ […***…]
Name: […***…]
Title: Inventor

EXHIBIT A

Inventions and Inventors

Inventions:

[…***…], generally characterized as […***…], […***…], […***…], and […***…], respectively.

Inventors:

[…***…]
[…***…]
[…***…]
[…***…]
[…***…]

CERTAIN INFORMATION CONTAINED IN THIS EXHIBIT, MARKED BY […*…], HAS BEEN EXCLUDED FROM THIS EXHIBIT BECAUSE THE REGISTRANT HAS DETERMINED THAT IT IS BOTH NOT MATERIAL AND IS THE TYPE THAT THE REGISTRANT TREATS AS PRIVATE OR CONFIDENTIAL.**

First Amendment to License Agreement

AMENDMENT dated as of December 17, 2004, to the License Agreement with an Effective Date of January 7th, 2004 between PRINCETON UNIVERSITY, a not-for-profit corporation duly organized and existing under the laws of the State of New Jersey and having a principal place of business at 4 New South Building, Princeton, New Jersey 08544-0036, United States of America, ("PRINCETON") and BIONANOMATRIX LLC, a limited liability company duly organized and existing under the laws of the State of Delaware (hereinafter referred to as "Licensee").

W I T N E S S E T H

WHEREAS, the Parties have entered into the Agreement and would like to amend the Agreement;

WHEREAS, the Parties now seek to amend the terms of the Agreement as set forth herein.

NOW THEREFORE, in consideration of the premises and the mutual covenants contained herein, the Parties agree to as follows:

1. Section 6.1 shall be shall be deleted in its entirety and replaced with the following language:

License Payment. BioNanomatrix agrees to pay to Princeton a license fee of […***…] (the "License Fee"). The License Fee shall be payable by BioNanomatrix in […***…]. In the event this Agreement is terminated by BioNanomatrix for any reason before the second anniversary of the Effective Date of this Agreement, then BioNanomatrix shall not be obligated to make […***…]. The License Fee is […***…]. After payment of these amounts, there shall be no further payment obligations of BioNanomatrix except as set for the Sections 6.2 through 6.8.

2. Section 5.4 (b) shall be shall be deleted in its entirety and replaced with the following language:

Bionanomatrix shall have raised at least […***…] prior to […***…].

BIONANOMATRIX LLC

/s/ Michael T. Boyce-Jacino	Michael T. Boyce-Jacino	12/23/04
By	Print Name	Date

PRINCETON UNIVERSITY

/s/ Michelle D. Christy	Michelle D. Christy	1/5/2005
By	Print Name	Date

CERTAIN INFORMATION CONTAINED IN THIS EXHIBIT, MARKED BY […*…], HAS BEEN EXCLUDED FROM THIS EXHIBIT BECAUSE THE REGISTRANT HAS DETERMINED THAT IT IS BOTH NOT MATERIAL AND IS THE TYPE THAT THE REGISTRANT TREATS AS PRIVATE OR CONFIDENTIAL.**

Second Amendment to License Agreement

AMENDMENT dated as of February 25, 2010, to the License Agreement ("Agreement") with an Effective Date of January 7th, 2004 between PRINCETON UNIVERSITY, a not-for-profit corporation duly organized and existing under the laws of the State of New Jersey and having a principal place of business at 4 New South Building, Princeton, New Jersey 08544-0036, United States of America, ("PRINCETON") and BIONANOMATRIX, LLC., a limited liability corporation duly organized and existing under the laws of the State of Delaware (hereinafter referred to as "BioNanomatrix").

W I T N ES S E T H

WHEREAS, the Parties have entered into the Agreement and would like to amend the Agreement;

WHEREAS, the Parties now seek to amend the terms of the Agreement as set forth herein.

NOW THEREFORE, in consideration of the premises and the mutual covenants contained herein, the Parties agree to as follows:

1. The License Agreement shall be amended to name Bionanomatrix, Inc., as successor in interest to and assignee of all assets of Bionanomatrix LLC, with a principal place of business at 3701 Market Street, 4th Floor, Philadelphia, PA 19104, as the Licensee and to omit Bionanomatrix LLC as a party to the License Agreement. Bionanomatrix, Inc. will assume all responsibilities, obligations, benefits and liabilities of Bionanomatrix LLC under the License Agreement.

2. Section 5.4(f) shall be shall be deleted in its entirety and replaced with the following language:

BioNanomatrix shall achieve a first commercial sale of Licensed Products or Licensed Methods by […***…].

3. Section 5.4(g) shall be shall be deleted in its entirety and replaced with the following language:

BioNanomatrix shall achieve total sales of Licensed Products and Licensed Methods of at least […***…].

4. The "BACKGROUND" Section shall be amended to include the following Princeton file #: […***…].

5. The "Princeton Patent Rights" Section, Paragraph 1.11, shall be amended to include United States patent #[…***…].

6. The first sentence of the "Grant of License", Section 2.1, shall be deleted in its entirety and replaced with the following language:

Grant of License. Subject to Section 12.1 and the other limitations set forth in this Agreement and subject to the Federal Government Interest, if any, Princeton hereby. grants to BioNanomatrix in the Territory a worldwide, right and license in the Field of Use under the Princeton Patent Rights to make, have made, use,

have used, reproduce, sublicense, create and implement improvements, distribute, import, export, market, promote, offer to sell, sell, have sold, rent, and lease Licensed Products and Services, including, without limitation, the right to make, have made, further develop, improve, use, sell and distribute the Licensed Products and Services for all commercial, military and other applications and to practice the Licensed Method.

Said right and license shall be exclusive for all of the Princeton Patent Rights EXCEPT for US patent #[…***…], for which Princeton grants a non-exclusive right and license only.

7. The "Limitation" Section, Paragraph 2.2, shall be amended to add the following sentence:

Princeton also retains the right to license United States patent # […***…] and Princeton file #: […***…], […***…] commercially and perform commercial research and any other business or non-business function for all field(s) of use, and to publish the results thereof.

8. The "Sublicensing" Section, Paragraph 3., shall be amended to add the following subsection:

3.4 Sublicensing of Non-Exclusive Rights. Notwithstanding the foregoing, BioNanomatrix shall have no right to sublicense the non-exclusive patents rights of Princeton file #: […***…], […***…], United States patent # […***…].

9. The "Patent Infringement" Section, Paragraph 11, shall be amended to include a new Section 11.4 as follows:

11.4 No Action Under Non-Exclusive Rights. Notwithstanding any of the foregoing, BioNanomatrix shall have no right to bring any infringement action for any alleged infringement of United States patent # […***…], or of Princeton file #: […***…], […***…].

BIONANOMATRIX LLC (successor by conversion to BioNanomatrix, LLC)

/s/ Edward L. Erickson	Edward L. Erickson, CEO	02/25/2010
By	Print Name	Date

PRINCETON UNIVERSITY

/s/ John F. Ritter	John F. Ritter	3/2/10
By	Print Name	Date

CERTAIN INFORMATION CONTAINED IN THIS EXHIBIT, MARKED BY […*…], HAS BEEN EXCLUDED FROM THIS EXHIBIT BECAUSE THE REGISTRANT HAS DETERMINED THAT IT IS BOTH NOT MATERIAL AND IS THE TYPE THAT THE REGISTRANT TREATS AS PRIVATE OR CONFIDENTIAL.**

Fourth Amendment to License Agreement

AMENDMENT dated as of February 9th, 2012, to the License Agreement ("Agreement") with an Effective Date of January 7th, 2004 between PRINCETON UNIVERSITY, a not-for- profit corporation duly organized and existing under the laws of the State of New Jersey and having a principal place of business at 4 New South Building, Princeton, New Jersey 08544-0036, United States of America, ("PRINCETON") and BIONANO GENOMICS, INC., a corporation duly organized and existing under the laws of the State of Delaware (hereinafter referred to as "BioNano Genomics").

WITNESSETH

WHEREAS, the Parties have entered into the Agreement and would like to amend the Agreement;

WHEREAS, the Parties now seek to amend the terms of the Agreement as set forth herein.

NOW THEREFORE, in consideration of the premises and the mutual covenants contained herein, the Parties agree to as follows:

1. Section 5.4(g) shall be shall be deleted in its entirety and replaced with the following language:

BioNano Genomics shall achieve total sales of […***…] of at least […***…] during the […***…].

BIONANO GENOMICS, INC.		PRINCETON UNIVERSITY	
Signature:	/s/ R. Erik Holmlin	Signature:	/s/ John F. Ritter
Name:	R. Erik Holmlin	Name:	John F. Ritter, Director
Title:	CEO	Title:	Office of Technology Licensing and Intellectual Property
Date:	Feb 10, 2012	Date:	2/9/12

CERTAIN INFORMATION CONTAINED IN THIS EXHIBIT, MARKED BY […*…], HAS BEEN EXCLUDED FROM THIS EXHIBIT BECAUSE THE REGISTRANT HAS DETERMINED THAT IT IS BOTH NOT MATERIAL AND IS THE TYPE THAT THE REGISTRANT TREATS AS PRIVATE OR CONFIDENTIAL.**

NON-EXCLUSIVE PATENT LICENSE AGREEMENT

This non-exclusive patent license agreement ("**Agreement**"), by and between Q Biotechnology C.V. ("**Licensor**"), a Dutch company with a place of business at Spoorstraat 50, 5911 KJ Venlo, the Netherlands and BioNano Genomics, Inc ("**Licensee**"), a Delaware (USA) corporation with a place of business at 9640 Town Centre Drive, Suite 100, San Diego, CA 92121, USA is made effective as of May 1st, 2014 ("**Effective Date**").

WHEREAS, Licensor is responsible for the out-licensing business of the QIAGEN Group and exploits QIAGEN Group's owned and licensed intellectual property by out-licensing intellectual property including marketing intellectual property rights and product related intellectual property and is authorized to enter into this Agreement; and

WHEREAS, Licensee desires to obtain a license under the Patent Rights upon the terms and conditions set forth herein, and Licensor desires to grant such a license; and

NOW, THEREFORE, in consideration of the foregoing premises and the mutual covenants herein contained, and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Parties hereby agree as follows:

1. DEFINITIONS.

"**Affiliate**" of a Party shall mean any corporation or business entity (i) of which more than fifty percent (50%) or more of the securities or other ownership interests representing the equity, the voting stock or general partnership interests are owned, controlled or held, directly or indirectly, by such Party; (ii) which directly or indirectly, owns, controls or holds more than fifty percent (50%) or more of the securities or other ownership interests representing the equity, the voting stock or, if applicable, the general partnership interests, of such Party; or (iii) of which more than fifty percent (50%) or more of the securities or other ownership interests representing the equity, the voting stock or general partnership interests are owned, controlled or held, directly or indirectly, by a corporation or business entity described in (i) or (ii).

"**Calendar Quarter**" shall mean the respective periods of three (3) consecutive calendar months ending on March 31, June 30, September 30, and December 31.

"**Combined Product**" shall mean combined products consisting of Royalty Product(s) and other products.

"**Commercial Sale**" shall mean the Net Sales invoicing of Royalty Products (hereinafter defined) to a third party.

"**Companion Diagnostic(s)**" and "**Companion Diagnostic use**" as the context requires, shall mean the use of Licensed Technology in Royalty Product(s) as part of a kit, a Laboratory developed Test or FDA-approved assay (or an equivalent approval from foreign regulatory agencies) for measurement, observation or determination of attributes, characteristics, disease, traits or other conditions of human beings *in vitro* with the purpose of predicting the likely clinical effectiveness and/or safety of a particular therapeutic intervention for a specific individual. Companion Diagnostics specifically excludes solely testing for the presence of disease or for disease screening or confirmation.

"**Confidential Information**" shall mean all information received by a Party from the other Party pursuant to this Agreement and any prior signed Non-Disclosure Agreement between the Parties still in effect at the Effective Date.

"**Diagnostic(s)**" and "**Diagnostic use**" as the context requires, shall mean the use of Royalty Product(s) for measurement, observation or determination of attributes, characteristics, disease, traits or other conditions of human beings or animals *in vitro* for diagnostic purposes within the Field whether as part of an FDA-approved assay (or an equivalent approval from foreign regulatory agencies) or under research use.

"**Distributor**" shall mean any distributor, reseller, dealer, sales representative, or authorized service provider, as applicable, of Licensee or its Affiliates that offers to sell or sells Royalty Products in the Territory.

"**Economic End Use**" shall have the meaning given in the definition of Net Sales.

"**Effective Date**" shall have the meaning given in the first paragraph of this Agreement, provided timely payment of all fees due and payable on the Effective Date.

"**Field**" shall mean Genome analysis using nanochannels in the Research Field.

"**First Commercial Sale**" shall mean the first time the Licensee or its Affiliates transfers a Royalty Product to an independent Third Party

"**License Fee**" shall have the meaning given in Section 3.1.

"**Licensed Technology**" shall mean any technology described by a Valid Claim in the Patent Rights.

"**List Price**" shall mean the non-discounted price of a product or service sold by Licensee, its Affiliates or Distributors as listed in a product/service catalog for a bona fide sale made to an end-user in an arms-length transaction.

"**Net Sales**" shall mean […***…] ("Economic End-Use"). For clarity, […***…] shall not be considered an Economic End Use and no royalty shall be due on Royalty Products used for such purpose. For purposes of calculating Net Sales, […***…]. Under any circumstances, revenue received from the sale or transfers of Royalty Products by Licensee, its Affiliates, or Distributors for an Economic End-Use shall give rise to a […***…] royalty payment to Licensor […***…].

In the case Licensee is unable to account for end-user sales by any distributor, the Net Sales shall be calculated as […***…].

"**OEM Sales**" shall mean sales of Combined Product, of Royalty Product in modified form (e.g. sales under another brand than the Own Company Label).

"**Own Company Label**" shall mean providing on the product or product label only the Licensee's own company name, logo, slogans or brand.

"**Party**" or "**Parties**", as the context requires, shall mean Licensee and/or Licensor.

"**Patent Rights**" shall mean any and all claims in any of the patent applications and/or patents listed in Schedule 1, any foreign equivalents thereof, and any divisions, continuations, continuations-in-part, reissues, renewals, extensions and the like of the foregoing. The Licensor has an exclusive license from the original owner of the Licensed Patents with the right to sub-license granted in a license Agreement dated […***…] (the "**Original License**").

"**Research Field**" shall mean the internal use of Royalty Product(s) by an end-user solely in applications of the end-user in scientific research and development or Research Service, excluding for the avoidance of doubt:

(a) any other commercial use

(b) Diagnostic use

(c) Companion Diagnostic use

"**Research Service**" shall mean the performance of research services under contract for the internal research activities by and for a research institution or university.

"**Royalty Product(s)**", shall mean a kit designed, developed, manufactured, or sold by Licensee or its Affiliates or its Distributors comprising "Licensed Technology" for use in the "Field"; in each case the design, development, manufacture, use, sale, offer for sale, provision, or import of which would be, but for the License, an infringement of a Valid claim of the Patent Rights.

"**Term**" shall have the meaning given in Section 5.1.

"**Territory**" shall mean all of the countries in the world at any given time.

"**Third Party**" shall mean any individual or entity other than Licensee or Licensor or Affiliates of either.

"**Valid claim**" shall mean any claim of an issued and unexpired patent, which patent is included within the Patent Rights, on a country-by-country-basis, which claim has not been held invalid, unpatentable or otherwise unenforceable by a court from which no appeal has or can be taken.

2. GRANT OF RIGHTS.

2.1 License Grant to Licensee.

(a) Subject to the terms and conditions of this Agreement, Licensor hereby grants to Licensee and its Affiliates on the Effective Date, a non-exclusive, royalty-bearing, non-sublicenseable (except for end-user licenses), and non-transferable license to make, have made, sell, have sold, use and import the Royalty Product(s) within the Field in the Territory solely under Licensee's Own Company Label. Licensee and Affiliates shall affix to each particular Royalty Product and to no other products, either on a product insert accompanying the product or on the product itself, the applicable notices to purchasers described in Schedule 2.

(b) Upon payment of the Diagnostic Use Option Fee (as defined in section 3.3 below), Licensor shall grant to Licensee and its Affiliates a non-exclusive, royalty-bearing, non-sublicenseable (except for end-user licenses), and non-transferable license to extend the license grant of section 2.1 (a) to cover Diagnostic Use. Licensee and Affiliates shall affix to each particular Royalty Product and to no other products, either on a product insert accompanying the product or on the product itself, the applicable notices to purchasers described in Schedule 3.

(c) Upon payment of the Companion Diagnostic Use Option Fee (as defined in section 3.4 below), Licensor shall grant to Licensee and its Affiliates a non-exclusive, royalty-bearing, non-sublicenseable (except for end-user licenses), and non-transferable license to extend the license grant of section 2.1 (a) to cover Companion Diagnostic Use. Licensee and Affiliates shall affix to each particular Royalty Product and to no other products, either on a product insert accompanying the product or on the product itself, the applicable notices to purchasers described in Schedule 4. [...***...].

2.2 Distributors. Notwithstanding the foregoing, Licensee may sell Royalty Product(s) to end users through distributors of Licensee and of its Affiliates, as long as Licensee reports and pays royalties on the Net Sales of such Royalty Product sales to end users.

2.3 Exclusion of OEM Sales. The License under Section 2.1 does not include the right for Licensee to make, sell, have sold, use and import the Royalty Product(s) in connection with OEM Sales.

2.4 Reporting of Unlicensed Activities. Licensee agrees that once it is notified by Licensor that, or once it independently becomes aware that, a particular purchaser is using or intends to use any Royalty Product(s) other than as permitted hereunder, Licensee shall immediately notify said purchaser in writing that such use is unlicensed

and that a license for said use must be obtained from Licensor. Licensee shall also require sublicensed Affiliates, and Distributors to report to Licensor any unlicensed activities of which they become aware. Licensee further agrees that continued or resumed sales by Licensee, a sublicensed Affiliate, or a Distributor, to a particular purchaser of which Licensee was previously notified or is otherwise aware is violating Patent Rights shall constitute a breach under Section 5.2 (b) of the Agreement. A written certification by a Distributor or purchaser which is executed by an officer of said Distributor or purchaser which officer may legally bind the company, that it has ceased infringing the Patent Rights, and/or, alternatively, that it does not infringe said Patent Rights, or a written certification by Licensee which is executed by an officer of Licensee which officer may legally bind Licensee that sales to such Distributor or purchaser have ceased, shall be a cure under Section 5.2. (b) Licensee shall provide to Licensor a copy of each of its notices to Customers pursuant to this Section.

2.5 No Implied Rights. This Agreement shall not provide either Party with any rights except those expressly granted herein. Licensor shall retain title to the Licensed Technology. This Agreement shall not be construed as a sale, lease, loan, assignment, or transfer of Licensor's intellectual property rights. The License does not permit Licensee, its Affiliates, Distributors, nor Manufacturers to sell, lease, assign, or otherwise transfer the rights granted under this Agreement to anybody.

3. LICENSE AND MILESTONE FEES.

3.1 License Fee. In consideration for the non-exclusive license described in Section 2.1 Licensee shall pay to Licensor a non-refundable, non-creditable fee in the amount of US Dollars […***…] (the "**License Fee**"). The License Fee shall be paid within […***…] after the Effective Date.

3.2 Milestone Fees.

(a) For the commercial launch of the first Royalty Product Licensee shall pay to Licensor a non-refundable, non-creditable milestone fee in the amount of US Dollars […***…]. The milestone shall be paid within […***…] days after the commercial launch.

(b) For the commercial launch of the first Royalty Product that provides insights to human genetic information Licensee shall pay to Licensor a non-refundable, non-creditable milestone fee in the amount of US Dollars […***…]. The milestone shall be paid within […***…] after the commercial launch.

3.3 Diagnostic Use Option. In consideration for the non-exclusive license described in Section 2.1 Licensee shall pay to Licensor […***…] fee in the amount of US Dollars […***…] (the "**Diagnostic Use Option Fee**"). US Dollars […***…] of such fee shall be paid within […***…] after the exercising the option and the remaining US Dollars […***…] shall be paid within […***…] after the First Commercial Sale of the first Royalty Product for "Diagnostic Use"

3.4 Companion Diagnostic Use Option. In consideration for the non-exclusive license described in Section 2.1 Licensee shall pay to Licensor a non-refundable, non-creditable fee in the amount of US Dollars […***…] (the "Companion Diagnostic Use Option Fee"). US Dollars […***…] of such fee shall be paid within […***…] days after the exercising the option and the remaining US Dollars […***…] shall be paid within […***…] after the First Commercial Sale of the first Royalty Product for "Companion Diagnostic Use"

4. ROYALTIES.

4.1 Royalties.

(a) Running Royalty. As consideration for the grant of the License, Licensee shall pay to Licensor a royalty of […***…] of any and all Net Sales of Royalty Products.

(b) Withholding Tax. Any payments made by Licensee to Licensor under this Agreement shall be free and clear of any taxes, duties, levies, fees or charges, and such amounts shall be reduced by the amount required to be paid or

withheld pursuant to any applicable law ("**Withholding Taxes**"). Any such Withholding Taxes required by law to be paid or withheld shall be an expense of, and borne solely by, Licensor. Licensee, as applicable, shall submit to Licensor reasonable proof of payment of the Withholding Taxes, together with an accounting of the calculations of such taxes, within […***…] after such Withholding Taxes are remitted to the proper authority. The Parties will cooperate reasonably in completing and filing documents required under the provisions of any applicable tax laws or under any other applicable law in connection with the making of any required tax payment or withholding payment, or in connection with any claim to a refund of or credit for any such payment.

(c) Payment terms. Royalties shall be payable within […***…] after the end of the Calendar Quarter in which Royalty Products were sold by Licensee, its Distributors and/or any Third Party. Licensee shall make royalty payments to Licensor in US Dollar (USD).

4.2 Royalty Reports. Commencing with respect to the Calendar Quarter in which the sale of the first unit of or provision of the first service component of Royalty Products takes place, and continuing throughout the Term, Licensee shall furnish to Licensor a written report for each Calendar Quarter showing (a) the number of units of Royalty Products sold or amount of services of Royalty Products provided by Licensee or its Affiliates (or treated as sold or provided under this Agreement or transferred to a Distributor for sale) during the Calendar Quarter, total gross invoice or total sales price (as applicable), and Net Sales by country in the local currency with conversion into US Dollar. The exchange rates employed must be those quoted by a reputable, nationally recognized source, such as a recognized money center bank such as JP Morgan, Bank of America or an equivalent, OANDA.com, or the Wall Street Journal. Exchange rates and the sources employed shall be included with the royalty report; (b) the amount of the royalties payable under this Agreement; and (c) if the […***…] approach is applied (identified in the "Net Sales" definition), then in reasonable detail, the calculation or formula used to determine the fair market value of the Royalty Products for the given Calendar Quarter. The sales information for Licensee's Affiliates shall be set out separately for each Affiliate by name of each such entity. Reports shall be due within […***…] after the end of the Calendar Quarter being reported. Licensee shall keep complete and accurate records in sufficient detail to enable the royalties payable hereunder to be determined, and Licensee shall retain the records for a period of […***…] from the date a royalty report is provided to Licensor.

4.3 Audits.

(a) Independent Auditor. Upon Licensor's written request, Licensee shall permit an independent certified public accounting firm of nationally recognized standing and/or an attorney selected by Licensor to have access during normal business hours to such of the records of Licensee or its Affiliates as may be reasonably necessary to verify the accuracy of the royalty reports hereunder. If requested by Licensor, Licensee shall make such records available at the premises of Licensee. Such audit will be conducted by an auditor and/or attorney that will be obligated to keep confidential Licensee's and its Affiliates' financial records and other information. The amounts charged by such accounting firm and/or attorney in connection with such audit shall be borne by Licensor unless a discrepancy as described in Section 4.3(b) is found. Professional advisors shall have a right to examine all materials, data, and information collected by or generated by the accountant and/or attorney during the course of their review, but only as may be relevant for the purpose of verifying the accuracy of amounts owed and paid under this Agreement. On request Licensor shall make a copy of the report available to Licensee. Licensor shall be able to use this information for the purpose of recovering any funds due under this Agreement, either in a negotiation, an alternative dispute resolution proceeding, or a court proceeding.

(b) Discrepancy; Interest.

(i) Discrepancy. If such accounting firm and/or attorney identifies a discrepancy in Licensor's favor during such period, i.e., Licensee has underpaid a royalty owed to Licensor, Licensee shall make payment to Licensor in the amount of such discrepancy, plus interest as calculated in Section 4.3(b)(ii), within […***…] of the date Licensor delivers to Licensee such accounting firm's or attorney's written report, or as otherwise mutually agreed by the Parties. In the event of such discrepancy of more than […***…] of the royalty due in Licensor's favor and subject to a minimum amount of US Dollar […***…] in royalties, Licensee will pay the costs of the audit within […***…] of receipt from Licensor of a copy of the invoice for such audit from the accounting firm.

(ii) Interest on Late Royalty. In the event that Licensee owes a royalty to Licensor under Section 4.3(b)(i), interest at the rate of […***…] above the interest rate of the European Central Bank ("**base rate**") or such lesser rate that is the maximum rate allowable under applicable law) from the due date until the date of full payment thereof shall be added to the discrepancy owed by Licensee to Licensor.

4.4 Payments.

Transactions from Licensee to Licensor under this Agreement shall be made by wire transfer to:

BANK NAME: […***…]

BENEFICIARY NAME: […***…]

IBAN: […***…]

BIC: […***…]

5. TERM AND TERMINATION.

5.1 Term. This license is granted to Licensee as of the Effective Date and will expire upon the expiration of the last to expire of the patents within Patent Rights, unless terminated earlier in accordance with this Agreement, in which case the period of the term shall end at the date of termination.

5.2 Termination by Licensor. Licensor may terminate this Agreement as follows:

(a) Insolvency. Upon thirty (30) days written notice if, at any time, Licensee shall file a petition for bankruptcy or insolvency or similar procedure, or if Licensee shall be served with an involuntary petition for bankruptcy or the like against it, filed in any insolvency proceeding, or if Licensee shall propose or be a party of any dissolution or liquidation procedure.

(b) Breach. Upon any material breach or default under this Agreement by Licensee or an Affiliate sublicensed by Licensee, including the failure to pay any money owed under this Agreement, this Agreement may be terminated by Licensor upon thirty (30) days written notice to Licensee. Said notice shall become effective at the end of the thirty-day period, unless during said period Licensee fully cures such breach or default and notifies Licensor of such cure.

(c) Change of Control. Immediately upon a change in control of Licensee (control means the holding of greater than fifty percent (50%) of (i) the capital and/or (ii) the voting rights and/or (iii) the right to elect or appoint directors) without the prior written consent of Licensor, which consent may be withheld at Licensor's sole discretion with the exception to a one-time event as agreed in section 8.1. Failure by Licensor to respond, within thirty (30) calendar days of receipt of a written request for consent to a change in control shall be deemed consent by Licensor. For the purpose of clarification, any internal restructuring measures within the corporate group of Licensee, or a public offering of its stock, or trading in its stock subsequent to a public offering, resulting in a change in control shall not entitle Licensor to a termination hereunder nor trigger the assignment fee in section 8.1.

(e) Loss of disposal rights regarding Licensed Patents. Upon the termination of the Original License for whatever reason and the resulting loss of disposal rights of Licensor regarding the Licensed Patents, this Agreement may be terminated by Licensor upon thirty (30) days written notice to Licensee.

5.3 Termination by Licensee. Licensee may terminate this Agreement as follows:

(a) Notice. Licensee may terminate the Agreement upon ninety (90) days written notice to Licensor.

5.4 Consequences of Termination

(a) Upon termination of this Agreement as provided herein, Licensee shall stop, and shall cause its Affiliates to stop, selling Royalty Products and all rights and licenses granted to Licensee by Licensor hereunder and all sublicenses granted by Licensee shall automatically terminate. Notwithstanding the foregoing, and upon termination of this Agreement for reasons other than pursuant to either of Sections 5.3, Licensee and its Affiliates shall have the right to continue selling, for a period of time not to exceed […***…] following the effective date of termination of this Agreement, those Royalty Products manufactured prior to the effective date of termination of this Agreement.

(b) Licensee's obligations to report to Licensor and to pay royalties as to the sale of Licensed Product hereunder pursuant to the Agreement prior to termination or expiration of the Agreement shall survive such termination or expiration.

(c) In the event of any termination of this Agreement, Licensee shall within […***…] of said termination, provide a written notice on the area(s) of its website pertaining to Licensed Products that Licensee is no longer licensed under Patent Rights.

6. ENFORCEMENT OF PATENTS.

6.1 Licensee shall advise Licensor promptly upon its becoming aware of infringement by a third party or parties of a patent within Patent Rights in the Territory. All decisions and rights to enforce Patent Rights against infringing third parties reside with Licensor, and nothing in this Agreement shall be construed to require Licensor to take any action to address any infringement or potential infringement or to otherwise enforce the Patent Rights.

7. CONFIDENTIALITY; PUBLICITY

7.1 Each Party shall (i) maintain the terms of this Agreement and any information exchanged in connection with this Agreement ("**Confidential Information**") in confidence during and for a period of […***…] after the termination or expiration of this Agreement, (ii) shall limit dissemination to those of its and its Affiliates' employees who require such Confidential Information in order to perform this Agreement and (iii) shall not disclose such Confidential Information to any other person or entity, and (iv) shall use such Confidential Information only to the extent necessary to perform this Agreement. Notwithstanding any other provision of this Agreement, Confidential Information shall not include any item of information which: (a) is within the public domain prior to the time of the disclosure by the disclosing Party or thereafter becomes within the public domain other than as a result of disclosure by the receiving Party or any of its representatives in violation of this Agreement; (b) was, on or before the date of disclosure in the possession of the receiving Party, as evidenced by records, however maintained; (c) is acquired by the receiving Party from a third party having the right to disclose without burden of confidentiality; (d) is hereafter independently developed by the receiving Party, as evidenced by records, however maintained; or (e) the receiving Party is required to disclose by law or by any administrative agency or is compelled to disclose by order of a court of competent jurisdiction, provided that such disclosure is subject to all applicable governmental or judicial protection available for like material and reasonable advance notice is given to the other Party.

8. ASSIGNMENT/TRANSFERABILITY.

8.1 Assignment by Licensee. The rights to be granted hereunder are specific to Licensee and shall not be assigned, sublicensed, or otherwise transferred by Licensee to any other party, without the prior written consent by Licensor. However, Licensor consents to a one-time assignment by Licensee if Licensee merges, consolidates, or transfers all or substantially all of its assets to a Third Party during the Term of this Agreement, which assignment shall be subject to a one-time assignment fee of US Dollar […***…] paid by Licensee to Licensor.

8.2 Assignment by Licensor. Licensor may assign all or any part of its rights and obligations under this Agreement at any time without the consent of Licensee. Licensee agrees to execute such further acknowledgments or other instruments as Licensor may reasonably request in connection with such assignment.

9. REPRESENTATIONS; WARRANTIES; NEGATION OF WARRANTIES.

Licensor represents and warrants that:

(a) Licensor is not aware that any third party is misappropriating, infringing, diluting, or violating the Patent Rights and no such claims have been brought against any third party by the Licensor.

(b) No patent or patent application under the Patent Rights is involved in any interference, reissue, re-examination or opposition proceeding and no such action has been threatened with respect to any such patent or patent application.

(c) Except for the representations and warranties provided in this Section 9, or otherwise expressly provided in this Agreement, Licensor makes no representations and warranties of any kind or any nature, whether expressed or implied and declines any liability therefrom. In particular Licensor does neither warrant freedom to operate under third-party intellectual property nor that no other intellectual property may be necessary to fully commercialize the Royalty Products in the Territory.

10. GENERAL.

10.1 Governing Law. This Agreement shall be governed by and interpreted in accordance with the laws of Germany, excluding the provisions of conflicts of laws. Any disputes arising out of or in connection with this Agreement shall be settled by the competent court at Düsseldorf, except as to any issue which depends upon the validity, scope or enforceability of any patent within Patent Rights which issue shall be determined in accordance with the laws of the territory in which such Patent Rights exist.

10.2 Severability. Should any provision of this Agreement be or become invalid, ineffective or unenforceable as a whole or in part, the validity, effectiveness and enforceability of the remaining provisions shall not be affected thereby. Any such invalid, ineffective or unenforceable provision shall, to the extent permitted by law, be deemed replaced by such valid, effective and enforceable provision as comes closest to the economic intent and purpose of such invalid, ineffective or unenforceable provision. The aforesaid shall apply mutatis mutandis to any gap in this Agreement.

10.3 No Waiver of Rights. No failure or delay on the part of either Party in the exercise of any power or right hereunder shall operate as a waiver thereof. No single or partial exercise of any right or power hereunder shall operate as a waiver of such right or of any other right or power. The waiver by any Party of a breach of any provision of this Agreement shall not operate or be construed as a waiver of any other or subsequent breach hereunder.

10.4 Survival. Sections 7, 9 and 10 shall survive any termination or expiration of the Agreement.

10.5 Amendments. Any changes or modifications of this Agreement, including a waiver of the written form, must be made in writing.

10.6 Notices. Any notice to be given under this Agreement must be in writing and delivered either in person, by any method of mail (postage prepaid) requiring return receipt, by nationally recognized overnight courier requiring signature upon delivery, or by facsimile confirmed thereafter by any of the foregoing methods, to the Party to be notified at its address(es) given below, or at any address any such Party has previously designated by prior written notice to the other Party. Notice shall be deemed sufficiently given for all purposes upon date of actual receipt.

(a) If to Licensor

Q Biotechnology C.V.
Attn: Sebastian Swienty
Spoorstraat 50
5911 KJ Venlo
Netherlands
With copy to:
QIAGEN GmbH
Attn: Legal Department
QIAGEN Straße 1
40724 Hilden
Germany

If to Licensee

BioNano Genomics, Inc.
9640 Towne Centre Drive, Suite 100
San Diego, CA 92121
Attention: Erik Holmlin
Facsimile: +1(858)888 7601

IN WITNESS WHEREOF, the Parties have executed this Agreement as of the Effective Date.

Q BIOTECHNOLOGY C.V.

By /s/ Dr. Juergen N. Schneider

Dr. Juergen N. Schneider
(Printed Name)

Managing Director
(Title)

BIONANO GENOMICS, INC.

By /s/ R. Erik Holmlin

R. Erik Holmlin
(Printed Name)

CEO
(Title)

Schedule 1 Patent Rights

[…***…]

Docket Number	Status	Application Number	Application Date	Patent Number	Grant Date	Expiration Date
[…***…]	[…***…]	[…***…]	[…***…]	[…***…]	[…***…]	[…***…]
[…***…]	[…***…]	[…***…]	[…***…]	[…***…]	[…***…]	[…***…]
[…***…]	[…***…]	[…***…]	[…***…]	[…***…]	[…***…]	[…***…]
[…***…]	[…***…]	[…***…]	[…***…]	[…***…]	[…***…]	[…***…]
[…***…]	[…***…]	[…***…]	[…***…]			[…***…]
[…***…]	[…***…]	[…***…]	[…***…]	[…***…]	[…***…]	[…***…]
[…***…]	[…***…]	[…***…]	[…***…]			[…***…]
[…***…]	[…***…]	[…***…]	[…***…]	[…***…]	[…***…]	[…***…]

Schedule 2 Product Marketing

NOTICE TO PURCHASER: LIMITED LICENSE

THE USE OF THIS PRODUCT FOR RESEARCH PURPOSES IS COVERED BY A LICENSE FROM QIAGEN GROUP. NO RIGHTS TO USE THIS PRODUCT TO PERFORM OR OFFER DIAGNOSTIC, COMPANION DIAGNOSTIC, COMMERCIAL TESTING OR OTHER COMMERCIAL SERVICES FOR MONEY OR MONEY'S WORTH ARE GRANTED BY THE SUPPLY OF THIS PRODUCT EXPRESSLY, BY IMPLICATION OR BY ESTOPPEL.

SHOULD YOU WISH TO USE THIS PRODUCT FOR ANY OTHER PURPOSE NOT COVERED BY THIS LICENSE, PLEASE CONTACT OIAGEN CORPORATE BUSINESS DEVELOPMENT AT BD@QIAGEN.COM.

Schedule 3 Product Marketing

NOTICE TO PURCHASER: LIMITED LICENSE

THE USE OF THIS PRODUCT FOR DIAGNOSTIC PURPOSES IS COVERED BY A LICENSE FROM QIAGEN GROUP. NO RIGHTS TO USE THIS PRODUCT TO PERFORM OR OFFER COMPANION DIAGNOSTIC TESTING ARE GRANTED BY THE SUPPLY OF THIS PRODUCT EXPRESSLY, BY IMPLICATION OR BY ESTOPPEL.

SHOULD YOU WISH TO USE THIS PRODUCT FOR ANY OTHER PURPOSE NOT COVERED BY THIS LICENSE, PLEASE CONTACT QIAGEN CORPORATE BUSINESS DEVELOPMENT AT BD@QIAGEN.COM.

Schedule 4 Product Marketing

THE USE OF THIS PRODUCT IS COVERED BY A LICENSE FROM QIAGEN GROUP. FOR FURTHER INFORMATION PLEASE CONTACT QIAGEN CORPORATE BUSINESS DEVELOPMENT AT BD@QIAGEN.COM.

CERTAIN INFORMATION CONTAINED IN THIS EXHIBIT, MARKED BY […*…], HAS BEEN EXCLUDED FROM THIS EXHIBIT BECAUSE THE REGISTRANT HAS DETERMINED THAT IT IS BOTH NOT MATERIAL AND IS THE TYPE THAT THE REGISTRANT TREATS AS PRIVATE OR CONFIDENTIAL.**

AMENDMENT

to the

NON-EXCLUSIVE PATENT LICENSE AGREEMENT

dated 01 May 2014

(the "**Amendment**")

effective as of 01 January 2018 (the "**Effective Date**")

between

Q Biotechnology C.V., a Dutch company with a place of business at Hulsterweg 82 , 5912 PL, Venlo, the Netherlands

- The "**LICENSOR**"

and

BioNano Genomics, Inc, a Delaware (USA) corporation with a place of business at 9640 Town Centre Drive, Suite 100, San Diego, CA 92121, USA,

- the "**LICENSSEE**" —

- the LICENSEE and the LICENSOR also referred to individually as

"**Party**" and together as the "**Parties**" -.

PREAMBLE

1. On 01 May 2014 the Parties entered into a non-exclusive patent license agreement (the "**Agreement**").

2. Effective as of the Effective Date, the Parties wish to amend the Agreement with regard to the conversion to an exclusive license in the Field A.

Now therefore, the Parties agree the following:

1. AMENDMENT OF THE AGREEMENT

1.1 Section 1, Subsection "**Field**" to the Agreement shall be deleted and replaced in its entirety as follows:

"***Field A***" shall mean labeling of DNA for use in genome mapping technologies for applications including, but not limited to, epigenetic analysis and genome structure analysis, but specifically excluding any applications in PCR, Sequencing and in the purification of biomolecules. For clarity, genome mapping shall mean analysis of genome features without doing Sequencing as defined in the present section.

"***Field B***" shall mean labeling of DNA for applications in the purification of biomolecules for use in genome mapping technologies.

"***Sequencing***" shall mean detecting and identifying each nucleotide of the sequence of a polynucleotide molecule.

1.2 Section 1, Subsection "**Patent Rights**" to the Agreement shall be deleted and replaced in its entirety as follows:

"***Patent Rights***" shall mean any and all claims in any of the patent applications and/or patents listed in Schedule 1, and any divisions, continuations, continuations-in-part, reissues, renewals, extensions and the like of the foregoing. The Licensor has an exclusive license from the original owner of the Licensed Patents with the right to sub-license granted in a license agreement dated […***…] (the "**Original License**").

1.3 Section 1 Subsection "Research Field" to the Agreement shall be deleted and replaced in its entirety as follows:

"***Research Field***" *shall mean the internal use of Royalty Product(s) by an end-user solely in applications of the end-user in research and development or Research Service, excluding for the avoidance of doubt:*

(a) Diagnostic use

(b) Companion Diagnostic use.

1.4 Section 1, Subsection "Royalty Product(s)" to the Agreement shall be deleted and replaced in its entirety as follows:

"***Royalty Product(s)***", *shall mean a kit designed, developed, manufactured, or sold by Licensee or its Affiliates or its Distributors comprising "Licensed Technology" in each case the design, development, manufacture, use, sale, offer for sale, provision, or import of which would be, but for the License, an infringement of a Valid claim of the Patent Rights.*

1.5 Section 1, Subsection "Diagnostic(s)" and "Diagnostic use" to the Agreement shall be deleted and replaced in its entirety as follows:

"***Diagnostic(s)***" *and* "***Diagnostic use***" *as the context requires, shall mean the use of Royalty Product(s) for measurement, observation or determination of attributes, characteristics, disease, traits or other conditions of human beings or animals in vitro for diagnostic purposes as part of an FDA-approved assay (or an equivalent approval from foreign regulatory agencies) or a Research Use Only (RUO) assay as regulated under Clinical Laboratory Improvement Amendments (CLIA) or a RUO assay subject to similar government approval or supervision in a non-US country).*

1.6 Section 2.1 (a) of the Agreement shall be deleted and replaced in its entirety as follows:

(a) i) Subject to the terms and conditions of this Agreement, Licensor hereby grants to Licensee and its Affiliates on the Effective Date, an exclusive, royalty-bearing, non-sublicenseable (except for end-user licenses), and non-transferable license to make, have made, sell, have sold, use and import the Royalty Product(s) within the Field A in the Research Field in the Territory solely under Licensee's Own Company Label. […***…]

ii) Subject to the terms and conditions of this Agreement, Licensor hereby grants to Licensee and its Affiliates on the Effective Date, a non-exclusive, royalty-bearing, non-sublicenseable (except for end-user licenses),. and non-transferable license to make, have made, sell, have sold, use and import the Royalty Product(s) within the Field B in the Research Field in the Territory solely under Licensee's Own Company Label. […***…]

(b) Upon payment of the Diagnostic Use Option Fee (as defined in section 3.3 below), Licensor shall grant to Licensee and its Affiliates a non-exclusive, royalty-bearing, non-sublicenseable (except for end-user licenses), and non-transferable license to

extend the license grant of section 2.1 (a) ii) to cover Diagnostic Use in Field A and Field B. […***…]

(c) Upon payment of the Companion Diagnostic Use Option Fee (as defined in section 3.4 below), Licensor shall grant to Licensee and its Affiliates a non-exclusive, royalty-bearing, non-sublicenseable (except for end-user licenses), and non-transferable license to extend the license grant of section 2.1 (a) ii) to cover Companion Diagnostic Use in Field A and Field B. […***…]

1.7 Section 3.2. of the Agreement shall be amended by adding the following:

*(c) For the placement of […***...] Royalty Products Licensee shall pay to Licensor a non-refundable, non-creditable milestone fee in the amount of US Dollars […***...]. The milestone shall be paid within […***...] after the placement of […***...] Royalty products.*

*(d) For reaching a cumulative Net Sales of […***...] Licensee shall pay to Licensor a non-refundable, non-creditable milestone fee in the amount of US Dollars […***...]. The milestone shall be paid within […***...] after reaching the Net Sales target.*

*(e) In the event of the initial public offering of the Licensee's and/or its Affiliates securities on a stock exchange Licensee shall pay to Licensor a non-refundable, non-creditable milestone fee in the amount of US Dollars […***...]. The milestone shall be paid within […***...] after date of the initial public offering.*

1.8 Section 4.1 of the Agreement shall be amended by adding the following:

(d) *Minimum Royalty. Commencing with calendar year 2018, Licensee agrees to pay Licensor an annual Minimum Royalty Payment ("MRP') on January 1, 2019 and on January 1 of each calendar year thereafter. The MRP shall be in the amount of US Dollars […***...] for calendar year 2018, US Dollars […***…] for calendar year 2019, and US Dollars […***...] for calendar year 2020 and each calendar year thereafter until the end of the Term. Licensor shall fully credit each MRP made against any Running Royalties payable by Licensee during the applicable calendar year.*

1.9 Section 8.1 of the Agreement shall be deleted and replaced in its entirety as follows:

Assignment by Licensee. The rights to be granted hereunder are specific to Licensee and shall not be assigned, sublicensed, or otherwise transferred by Licensee to any other party, without the prior written consent by Licensor. However, Licensor consents to a one-time assignment by Licensee if Licensee merges, consolidates, or transfers all or substantially all of its assets to a Third Party during the Term of this Agreement, which assignment shall be subject to a one-time assignment fee of US Dollar […***…] paid by Licensee to Licensor.

1.10 Section 4.4 of the Agreement shall be deleted and replaced in its entirety as follows:

Transactions from Licensee to Licensor under this Agreement shall be made by wire transfer to:

BANK NAME: […***…]

BANK ADDRESS: […***…]

BENEFICIARY NAME: […***…]

IBAN: […***…]

BIC/Swift Code: […***…]

1.11 All other provisions of the Agreement shall remain unaltered and in force. Definitions in this Amendment shall have the same meaning as in the Agreement unless expressly stated otherwise in this Amendment.

2. MISCELLANEOUS

2.1 All notices, requests and other communications hereunder shall be made in writing in English language and delivered by hand, by courier, by post or by fax (provided that the faxes be confirmed promptly in writing) to the person at the address set forth below, or such other address as may be designated by the respective Party to the other Party in the same manner:

2.2 Any provision of the Amendment (including this Section 2.2) may be amended or waived only if such amendment or waiver is (i) by written instrument executed by each Party and explicitly refers to this Amendment or (ii) by notarized deed if required by law.

2.3 Should any provision of this Amendment, or any provision incorporated into this Amendment in the future, be or become invalid or unenforceable, the validity or

enforceability of the other provisions of this Amendment shall not be affected thereby. The Parties hereby agree to substitute the invalid or unenforceable provision by a suitable and equitable provision which, to the extent legally permissible, comes as close as possible to the intent and purpose of the invalid or unenforceable provision. The same shall apply: (i) if the Parties have, unintentionally, failed to address a certain matter in this Amendment; in this case a suitable and equitable provision shall be deemed to have been agreed upon which comes as close as possible to what the Parties, in the light of the intent and purpose of this Amendment, would have agreed upon if they had considered the matter; or (ii) if any provision of this Amendment is invalid because of the scope of any time period or performance stipulated herein; in this case the Parties hereby agree to substitute the time period or performance by that which is legally permissible and comes as close as possible to the stipulated time period or performance. For the avoidance of doubt, any period of limitation shall not be prolonged by sentence 3.

3. AMENDMENT FEE

In consideration for the amendments to the Agreement made hereunder, Licensee shall pay Licensor a non-refundable, non-creditable payment of […***…] within […***…] after the Effective Date. Such payment shall be payable by wire transfer in accordance with Sections 4.1 (b) and 4.4 of the amended Agreement.

Q Biotechnology C.V.		**BioNano Genomics, Inc.**	
By:	/s/ Evander Boogwart	By:	/s/ R. Erik Holmlin
Name:	Evander Boogwart	Name:	R. Erik Holmlin
Title:	Director	Title:	CEO

CERTAIN INFORMATION CONTAINED IN THIS EXHIBIT, MARKED BY […*…], HAS BEEN EXCLUDED FROM THIS EXHIBIT BECAUSE THE REGISTRANT HAS DETERMINED THAT IT IS BOTH NOT MATERIAL AND IS THE TYPE THAT THE REGISTRANT TREATS AS PRIVATE OR CONFIDENTIAL.**

LICENSE AGREEMENT

This Agreement, effective as of November 4, 2013 (the "Effective Date"), is by and between:

NEW YORK UNIVERSITY (hereinafter "NYU"), a corporation organized and existing under the laws of the State of New York and having a place of business at 70 Washington Square South, New York, New York 10012

AND

BioNano Genomics, Inc. (hereinafter "CORPORATION"), a corporation organized and existing under the laws of the State of Delaware and having its principal office at 9640 Towne Centre Drive, Suite 100, San Diego, CA 92121.

RECITALS

WHEREAS, […***…] of NYU (hereinafter "the NYU Scientist") together with […***…], formerly of NYU, have made certain inventions relating to […***…], all as more particularly described in a pending U.S. patent application and issued US patents jointly owned by NYU and […***…] ([…***…]), identified in annexed Appendix I and forming an integral part hereof (hereinafter "the Pre-Existing Inventions");

WHEREAS, NYU and […***…] have entered into an Inter-Institutional Agreement effective […***…] in which […***…] grants to NYU the exclusive right on behalf of […***…] to enter into license Agreements to the Pre-Existing Inventions;

WHEREAS, […***…] have developed software, […***…], as described in Appendix II;

WHEREAS, subject to the terms and conditions hereinafter set forth, NYU is willing to grant to CORPORATION and CORPORATION is willing to accept from NYU the License (as hereinafter defined);

NOW, THEREFORE, in consideration of the mutual promises and agreements contained herein, the parties hereto hereby agree as follows:

1. Definitions.

1.01. "Affiliate" shall mean any company or other legal entity which controls, or is controlled by, or is under common control with, CORPORATION; control means the holding of greater than fifty percent (50%) of (i) the capital and/or (ii) the voting rights and/or (iii) the right to elect or appoint directors.

1.02. "Calendar Year" shall mean any consecutive period of twelve months commencing on the first day of January of any year.

1.03. "Date of First Commercial Sale" shall mean the date on which a Licensed Product is first offered for sale by CORPORATION or an Affiliate or sublicensee of CORPORATION.

1.04. "Derivative" shall mean any derivative work, product, device or computer software or code using or based on, in whole or in part, the NYU Software or NYU Copyrights and/or incorporating all or any part of the NYU Software or NYU Copyrights including without limitation, translations of such a work to other computer _ languages, adaptations of such a work to other hardware platforms or operating systems, and corrections and enhancements of any such work.

1.05. "Field" shall mean the detection, identification, and analysis of […***…] organisms with the exception of microorganisms.

1.06. “License” shall mean the non-exclusive, non-sublicensable (except for end-user licenses) worldwide license to practice the Research Technology (as hereinafter defined) to develop, make, have made, use, offer for sale, sell or have sold the Licensed Products (as hereinafter defined) in the Field.

1.07. “Licensed Products” shall mean all products and services, including without limitation systems, hardware, and software, covered by a issued claim of any unexpired NYU Patent (as hereinafter defined) which has not been disclaimed or held invalid by a court of competent jurisdiction from which no appeal can be taken, or which incorporates NYU Software or Research Technology.

1.08. “Royalty Bearing Products” shall mean (i) all systems and instruments for the detection, identification, and analysis of […***…] organisms; and (ii) consumables, including without limitation chips, cartridges, and reagents; and (iii) all services related to the use of Licensed Products including without limitation haplotyping services. For the avoidance of doubt, the parties agree that the Irys™ instrument is a Royalty Bearing Product under (i) above if sold without incorporating NYU Software or Research Technology and is a Licensed Product if sold with NYU Software or incorporating Research Technology.

1.09. Net Sales should mean […***…] to any person or entity that is not an Affiliate of CORPORATION under the License, after deduction of all the following to the extent applicable to such sales;

i) […***…]

ii) […***…]

iii) […***…];

iv) […***…];

v) […***…]

vi) […***…]

Net Sales shall be […***…]

1.10. “NYU Copyrights” shall mean NYU’s interest in all United States and foreign copyrights in the NYU Software (as hereinafter defined), including but not limited to software, animation, characters, algorithms, screen design, text, storyboard, scenario, video, and medical imaging masks, and any Derivative thereof developed by CORPORATION or its Affiliates.

1.11. “NYU Patents” shall mean all United States and foreign patents and patent applications, and any existing and future divisionals, continuations, in whole or in part, reissues, renewals and extensions thereof, and pending applications therefor which claim Pre-Existing Inventions and which are identified on annexed Appendix I.

1.12. "NYU Software" shall mean NYU's interest in the […***…] software and computer code, or any portion thereof and which are identified on annexed Appendix II.

1.13. "Research Technology" shall mean all NYU Patents and NYU Copyrights.

2. Effective Date.

This Agreement shall be effective as of the Effective Date and shall remain in full force and effect until it expires or is terminated in accordance with Section 13 hereof.

3. Title.

3.01. It is hereby agreed that all right, title and interest, in and to the Research Technology, and in and to any drawings, plans, diagrams, specifications, and other documents containing any of the Research Technology shall vest solely in NYU. At the request of NYU, CORPORATION shall take all steps as may be necessary to give full effect to said right, title and interest of NYU including, but not limited to, the execution of any documents that may be required to record such right, title and interest with the appropriate agency or government office.

3.02. For so long as the NYU Scientist is employed by NYU, any and all inventions made by the NYU Scientist and relating to the Field shall be owned solely by NYU.

4. Patents and Patent Applications.

4.01. At the initiative of CORPORATION or NYU, the parties shall consult with each other regarding the prosecution of all patent applications with respect to the Research Technology. Such patent applications shall be filed, prosecuted and maintained by the law firm of Dorsey & Whitney or by other patent counsel jointly selected by NYU and CORPORATION. Copies of all such patent applications and patent office actions shall be forwarded in a timely manner to each of NYU and CORPORATION. NYU and CORPORATION shall each also have the right to have such patent applications and patent office actions independently reviewed by other

patent counsel separately retained by NYU or CORPORATION, upon prior notice to and consent of the other party, which consent shall not unreasonably be withheld.

4.03. All applications and proceedings with respect to the NYU Patents shall be filed, prosecuted and maintained by NYU in NYU's sole discretion. NYU shall be free to abandon any NYU Patent.

4.04 NYU agrees to provide written notification to the CORPORATION if NYU intends to terminate prosecution of any patent applications identified in Appendix I or filed with respect to the Research Technology.

4.05 Nothing herein contained shall be deemed to be a warranty by NYU that

i) NYU can or will be able to obtain any patent or patents on any patent application or applications in the NYU Patents or any portion thereof, or that any of the NYU Patents will afford adequate or commercially worthwhile protection, or

ii) that the manufacture, use, or sale of any element of the Research Technology or any Licensed Product will not infringe any patent(s) of a third party.

4.06. CORPORATION and any Affiliates of CORPORATION shall insure that they apply patent markings that meet all requirements of U.S. law, 35 U.S.C. § 287, with respect to all Licensed Products.

5. Grant of License.

5.01. Subject to the terms and conditions hereinafter set forth, NYU hereby grants to CORPORATION and CORPORATION hereby accepts from NYU the License.

5.02. NYU reserves the right to use, and to permit other non-commercial entities to use, the Research Technology for educational and research purposes,

5.03. The parties acknowledge that the United States government retains rights in intellectual property funded under any grant or similar contract with a Federal agency. The License is expressly subject to all applicable United States government rights, including, but not limited to, any applicable requirement that products, which result from such intellectual property and are sold in the United States, must be substantially manufactured in the United States.

5.04. The License granted to CORPORATION in Section 5.01 hereto shall commence upon the Effective Date and shall remain in force on a country-by-country basis, if not previously terminated under the terms of this Agreement, for fifteen (15) years from the Date of First Commercial Sale in such country or until the expiration date of the last to expire of the NYU Patents whichever shall be later. CORPORATION shall inform NYU in writing of the Date of First Commercial Sale with respect to each Licensed Product in each country as soon as practicable after the making of each such first commercial sale.

5.05. The CORPORATION will retain ownership of any improvements or developments of the Research Technology made solely by the CORPORATION, other than Derivatives.

6. Payments for License.

6.01. In consideration for the grant and during the term of the License with respect to each Licensed Product, CORPORATION shall pay to NYU:

(a) on the Effective Date, a non-refundable, non-creditable license issue fee of […***…]; and

(b) a royalty on the Net Sales of CORPORATION and each Affiliate of CORPORATION as follows:

(i) […***…] of the Net Sales of consumables consisting of […***…]; and

(ii) […***…] of the Net Sales of services including without […***…]; and

(iii) […***…] of all other Net Sales.

(c) a milestone payment of […***…] upon the […***…], including without limitation […***…].

6.02. Beginning with Calendar Year 2014 and continuing thereafter until this Agreement shall terminate or expire, CORPORATION agrees that if the total royalties paid to NYU under subsection 6.01(b) hereof do not amount to […***…] in each Calendar Year, CORPORATION will pay to NYU within […***…] after the end of each such Calendar Year, as additional royalty, the difference between the […***…], failing which NYU shall have the right solely at Its election, upon written notice to CORPORATION, to terminate this Agreement for cause.

6.03. For the purpose of computing the royalties due to NYU hereunder, the year shall be divided into four parts ending on March 31, June 30, September 30, and December 31. Not later than […***…] after each December,

March, June, and September in each Calendar Year during the term of the License, CORPORATION shall submit to NYU a full and detailed report of royalties or payments due NYU under the terms of this Agreement for the preceding quarter year (hereinafter "the Quarter-Year Report"), setting forth the Net Sales and/or lump sum payments and all other payments or consideration upon which such royalties are computed and including at least

i) the quantity of Licensed Products and Royalty Bearing Products used, sold, transferred or otherwise disposed of;

ii) the selling price of each Licensed Product;

iii) the deductions permitted under subsection 1.09 hereof to arrive at Net Sales; and

iv) the royalty computations and subject of payment.

If no royalties or other payments are due, a statement shall be sent to NYU stating such fact. Payment of the full amount of any royalties or other payments due to NYU for the preceding quarter year shall accompany each Quarter-Year Report on royalties and payments. CORPORATION shall keep for a period of at least six (6) years after the date of entry, full, accurate and complete books and records consistent with sound business and accounting practices and in such form and in such detail as to enable the determination of the amounts due to NYU from CORPORATION pursuant to the terms of this Agreement.

6.04. On reasonable notice and during regular business hours, NYU or the authorized representative of NYU shall each have the right to inspect the books of accounts, records and other relevant documentation of CORPORATION or of Affiliates of CORPORATION insofar as they relate to the production, marketing and sale of the Licensed Products and Royalty Bearing Products, in order to ascertain or verify the amount of royalties and other payments due to NYU hereunder, and the accuracy of the information provided to NYU in the aforementioned reports. The cost of such inspection shall be borne by NYU, unless it is determined in such inspection that NYU has been underpaid in any period by more than […***…] of the amount which NYU should have been paid, in which case the cost of such inspection shall be reimbursed to NYU by CORPORATION.

7. Method of Payment.

7.01. Royalties and other payments due to NYU hereunder shall be paid to NYU in United States dollars. Any such royalties on or other payments relating to transactions in a foreign currency shall be converted into United States dollars based on the closing buying rate of the Morgan Guaranty Trust Company of New York applicable to transactions under exchange regulations for the particular currency on the last business day of the accounting period for which such royalty or other payment is due.

7.02. CORPORATION shall be responsible for payment to NYU of all royalties due on sale, transfer or disposition of Licensed Products and Royalty Bearing Products by each Affiliate of CORPORATION.

7.03. Any amount payable hereunder by one of the parties to the other, which has not been paid by the date on which such payment is due, shall bear interest form such date until the date on which such payment is made, at the rate of […***…] per annum in excess of the prime rate prevailing at the Citibank, N.A., in New York, during the period of arrears and such amount and the interest thereon may be set off against any amount due, whether in terms of this Agreement or otherwise, to the party in default by any non-defaulting party.

8. Development and Commercialization.

8.01. CORPORATION undertakes to use continuous reasonable diligence to make and sell Licensed Products, including but not limited to, the performance of all efficacy, pharmaceutical, safety, toxicological and clinical tests,

trials and studies and all other activities necessary in order to obtain the approval of the FDA for the production, use and sale of the Licensed Products, all as set forth in the Development Plan (annexed hereto as Appendix III and which is an integral part of this Agreement) and within all timetables set forth therein. CORPORATION further undertakes to exercise due diligence and to employ its reasonable diligence to obtain, the appropriate approvals of the health authorities for the production, use and sale of the Licensed Products, in each of the other countries of the world in which CORPORATION intend to produce, use, and/or sell Licensed Products.

8.02. Provided that applicable laws, rules and regulations require that the performance of the tests, trials, studies and other activities specified in Paragraph 8.01 above shall be carried out in accordance with FDA Good Laboratory Practices and in a manner acceptable to the relevant health authorities, CORPORATION shall carry out such tests, trials, studies and other activities in accordance with FDA Good Laboratory Practices and in a manner acceptable to the relevant health authorities. Furthermore, the Licensed Products shall be produced in accordance with FDA Good Manufacturing Practice ("GMP") procedures in a facility which has been certified by the FDA as complying with GMP, provided that applicable laws, rules and regulations so require.

8.03. CORPORATION undertakes to begin the regular commercial production, use, and sale of the Licensed Products in good faith in accordance with the Development Plan and to continue diligently thereafter to commercialize the Licensed Products.

8.04. CORPORATION shall provide NYU with written annual reports on all activities and actions undertaken by CORPORATION to develop and commercialize the Licensed Products; such reports shall be made within sixty (60) days after each June 30th for the duration of this Agreement.

8.05. If CORPORATION shall not commercialize the Licensed Products within a reasonable time frame, unless such delay is necessitated by FDA or other regulatory agencies or unless NYU and CORPORATION have mutually agreed to amend the Development Plan because of unforeseen circumstances, NYU shall notify CORPORATION in writing of CORPORATION's failure to commercialize and shall allow CORPORATION sixty (60) days to cure its failure to commercialize. CORPORATION's failure to cure such delay to NYU's reasonable satisfaction within such 60-day period shall be a material breach of this Agreement.

9. CONFIDENTIAL INFORMATION.

9.01. Except as otherwise provided in Section 9.02 and 9.03 below CORPORATION shall maintain any and all of the Research Technology in confidence and shall not release or disclose any tangible or intangible component thereof to any third party without first receiving the prior written consent of NYU to said release or disclosure.

9.02. The obligations of confidentiality set forth in Sections 9.01 shall not apply to any component of the Research Technology which was part of the public domain prior to the Effective Date of this Agreement or which becomes a part of the public domain not due to some unauthorized act by or omission of CORPORATION after the effective date of this Agreement or which is disclosed to the CORPORATION by a third party who has the right to make such disclosure.

9.03. The provisions of Section 9.01 notwithstanding, CORPORATION may disclose the Research Technology to third parties who need to know the same in order to secure regulatory approval for the sale of Licensed Products.

10. Infringement of NYU Patent.

10.01. In the event a party to this Agreement acquires information that a third party is infringing one or more of the NYU Patents, the party acquiring such information shall promptly notify the other party to the Agreement in writing of such infringement.

10.02. As between the parties, NYU shall have the sole right but not the obligation to pursue any infringers and to retain any recovery therefrom. NYU may grants such rights to third parties.

11. Liability and Indemnification.

11.01. CORPORATION shall indemnify, defend and hold harmless NYU and its trustees, officers, medical and professional staff, employees, students and agents and their respective successors, heirs and assigns (the "Indemnitees"), against any liability, damage, loss or expense (including reasonable attorneys' fees and expenses of litigation) incurred by or imposed upon the Indemnitees or any one of them in connection with any claims, suits, actions, demands or judgments (i) arising out of the design, production, manufacture, sale, use in commerce or in human clinical trials, lease, or promotion by CORPORATION or by a licensee, Affiliate or agent of CORPORATION of any Licensed Product or Royalty Bearing Product, process or service relating to, or developed pursuant to, this Agreement or (ii) arising out of any other activities to be carried out pursuant to this Agreement.

11.02. With respect to an Indemnitee, CORPORATION's indemnification under subsection 11.01(i) shall apply to any liability, damage, loss or expense whether or not it is attributable to the negligent activities of such Indemnitee. CORPORATION's indemnification obligation under subsection 11.01(ii) shall not apply to any liability, damage, loss or expense to the extent that it is attributable to the negligent activities of any such Indemnitee.

11.03. CORPORATION agrees, at its own expense, to provide attorneys reasonably acceptable to NYU to defend against any actions brought or filed against any Indemnitee with respect to the subject of indemnity to which such Indemnitee is entitled hereunder, whether or not such actions are rightfully brought.

12. Security for Indemnification.

12.01. At such time as any Licensed Product or Royalty Bearing Product, process or service relating to, or developed pursuant to, this Agreement Is being commercially distributed or sold or tested in clinical trials by CORPORATION or by a licensee, Affiliate or agent of CORPORATION, CORPORATION shall at its sole cost and expense, procure and maintain policies of comprehensive general liability insurance in amounts not less than $[…***…] per incident and $[…***…] annual aggregate during the period that such Licensed Product, Royalty Bearing Product, process, or service is being tested in clinical trials or commercially distributed or sold, and in each case naming the Indemnitees as additional insureds. Such comprehensive general liability insurance, shall provide (i) product liability coverage and (ii) broad form contractual liability coverage for CORPORATION's indemnification under Section 11 of this Agreement. If CORPORATION elects to self-insure all or part of the limits described above (including deductibles or retentions which are in excess of $[…***…] annual aggregate) such self-insurance program shall include assets or reserves which have been actuarially determined for the liabilities associated with this Agreement and must be acceptable to NYU.

The minimum amounts of insurance coverage required under this Section 12 shall not be construed to create a limit of CORPORATION's liability with respect to its indemnification under Section 11 of this Agreement.

12.02. CORPORATION shall provide NYU with written evidence of such insurance upon request of NYU. CORPORATION shall provide NYU with written notice at least sixty (60) days prior to the cancellation, non-renewal or material change in such insurance; if CORPORATION does not obtain replacement insurance providing comparable coverage within such sixty (60) day period, NYU shall have the right to terminate this Agreement effective at the end of such sixty (60) day period without notice or any additional waiting periods.

12.03. CORPORATION shall maintain such comprehensive general liability insurance beyond the expiration or termination of this Agreement during (i) the period that any product, process or service, relating to, or developed pursuant to, this Agreement is being commercially distributed or sold or tested in clinical trials by CORPORATION or by an Affiliate or agent of CORPORATION and,(ii) a reasonable period after the period referred to in (i) above which in no event shall be less than five (5) years.

13. Expiry and Termination

13.01. Unless earlier terminated pursuant to this Section 13 or Section 6.02, hereof, this Agreement shall expire upon the expiration of the period of the License in all countries as set forth in Section 5.04 above.

13.02. At any time prior to expiration of this Agreement, either party may terminate this Agreement forthwith for cause, as "cause" is described below, by giving written notice to the other party. Cause for termination by one party of this Agreement shall be deemed to exist if the other party materially breaches or defaults In the performance or observance of any of the provisions of this Agreement and such breach or default is not cured within sixty (60) days or, in the case of failure to pay any amounts due hereunder, thirty (30) days (unless otherwise specified herein) after the giving of notice by the other party specifying such breach or default, or if either NYU or CORPORATION discontinues its business or becomes insolvent or bankrupt.

13.03. Upon termination of this Agreement for any reason and prior to expiration as set forth in Section 13.01 hereof, all rights in and to the Research Technology shall revert to NYU, and CORPORATION shall not be entitled to make any further use whatsoever of the Research Technology.

13.04. CORPORATION may terminate this Agreement by giving ninety (90) days' advance written notice of termination to NYU.

13.05. This Agreement may be terminated by mutual written consent of both parties.

13.06. Termination of this Agreement shall not relieve either party of any obligation to the other party incurred prior to such termination.

13.07. Sections 3, 9, 11, 12, 13 and 17 hereof shall survive and remain in full force and effect after any termination, cancellation or expiration of this Agreement.

14. Representations and Warranties by CORPORATION.

CORPORATION hereby represents and warrants to NYU as follow:

(1) CORPORATION is a corporation duly organized, validly existing and in good standing under the laws of the State of Delaware. CORPORATION has been granted all requisite power and authority to carry on its business and to own and operate its properties and assets. The execution, delivery and performance of this Agreement has been duly authorized by CORPORATION

(2) There is no pending or, to CORPORATION's knowledge, threatened litigation involving CORPORATION which would have any effect on this Agreement or on CORPORATION's ability to perform its obligations hereunder; and

(3) There is no indenture, contract, or agreement to which CORPORATION is a party or by which CORPORATION is bound which prohibits or would prohibit the execution and delivery by CORPORATION of this Agreement or the performance or observance by CORPORATION of any term or condition of this Agreement,

15. Representations and Warranties by NYU.

NYU hereby represents and warrants to CORPORATION as follows:

(1) NYU is a corporation duly organized, validly existing and in good standing under the laws of the State of New York. NYU has been granted all requisite power and authority to carry on its business and to own and operate its properties and

assets. The execution, delivery and performance of this Agreement have been duly authorized by the Board of Trustees of NYU.

(2) There is no pending or, to NYU's knowledge, threatened litigation involving NYU which would have any effect on this Agreement or on NYU's ability to perform its obligations hereunder; and

(3) There is no indenture, contract, or agreement to which NYU is a party or by which NYU is bound which prohibits or would prohibit the execution and delivery by NYU of this Agreement or the performance or observance by NYU of any term or condition of this Agreement.

16. No Assignment.

Neither CORPORATION nor NYU shall have the right to assign, delegate or transfer at any time to any party, in whole or In part, any or all of the rights, duties and interest herein granted without first obtaining the written consent of the other to such assignment.

17. Use of Name.

Without the prior written consent of the other party, neither CORPORATION nor NYU shall use the name of the other party or any adaptation thereof or of any staff member, employee or student of the other party:

i) in any product labeling, advertising, promotional or sales literature;

ii) in connection with any public or private offering or in conjunction with any application for regulatory approval, unless disclosure is otherwise required by law, in which case either party may make factual statements concerning the Agreement or file copies of the Agreement after providing the other party with an opportunity to comment and reasonable time within which to do so on such statement in draft.

Except as provided herein, neither NYU nor CORPORATION will issue public announcements about this Agreement without prior written approval of the other party.

18. Miscellaneous,

18.01. In carrying out this Agreement the parties shall comply with all local, state and federal laws and regulations including but not limited to, the provisions of Title 35 United States Code §200 et seq. and 15 CFR §368 et seq.

18.02. If any provision of this Agreement is determined to be invalid or void, the remaining provisions shall remain in effect.

18.03. This Agreement shall be governed by and construed in accordance with the laws of New York, without regard to principles relating to conflicts of law. The courts of the State of New York in New York County and the United States District Court for the Southern District of New York shall have exclusive jurisdiction over the parties with respect to any dispute or controversy between them arising under or in connection with this Agreement and, by execution and delivery of this Agreement, the parties to this Agreement submit to the jurisdiction of those courts, including, but not limited to, the in personam and subject matter jurisdiction of those courts, waive any objection to such jurisdiction on the grounds of venue or forum non conveniens, the absence of in personam or subject matter jurisdiction and any similar grounds, consent to service of process by mail in accordance with paragraph 18.04 or any other manner permitted by law and irrevocably agree to be bound by any such judgment rendered thereby in connection with this Agreement. These consents to jurisdiction shall not be deemed to confer rights on any person other than the parties to this Agreement.

18.04. All payments or notices required or permitted to be given under this Agreement shall be given in writing and shall be effective when either personally delivered or deposited, postage prepaid, in the United States registered or certified mail, or with a recognized overnight delivery service (e.g., Federal Express or DHL), addressed as follows:

To NYU: New York University
Office of Industrial Liaison
One Park Avenue, 6th Floor
New York, NY 10016
Attention: Abram M. Goldfinger
Executive Director,
Industrial Liaison/Technology Transfer

and

Office of Legal Counsel
New York University
Bobst Library
70 Washington Square South
New York, NY 10012
Attention: Mark Righter, Esq
Associate General Counsel

To CORPORATION:
BioNano Genomics, Inc.
9640 Towne Centre Drive, Suite 100
San Diego, CA 92121
Attention: Erik Holmlin
President and CEO

or such other address or addresses as either party may hereafter specify by written notice to the other. Such notices and communications shall be deemed effective on the date of delivery or fourteen (14) days after having been sent by registered or certified mail, whichever is earlier.

18.05. This Agreement (and the annexed Appendix) constitute the entire Agreement between the parties and no variation, modification or waiver of any of the terms or conditions hereof shall be deemed valid unless made in writing and signed by both parties hereto, This Agreement supersedes any and all prior agreements or understandings, whether oral or written, between CORPORATION and NYU.

18.06. No waiver by either party of any non-performance or violation by the other party of any of the covenants, obligations or agreements of such other party hereunder shall be deemed to be a waiver of any subsequent violation or non-performance of the same or any other covenant, agreement or obligation, nor shall forbearance by any party be deemed to be a waiver by such party of its rights or remedies with respect to such violation or non-performance.

18.07. The descriptive headings contained in this Agreement are included for convenience and reference only and shall not be held to expand, modify or aid in the interpretation, construction or meaning of this Agreement.

18.08. It is not the intent of the parties to create a partnership or joint venture or to assume partnership responsibility or liability. The obligations of the parties shall be limited to those set out herein and such obligations shall be several and not joint.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement effective as of the date and year first above written.

NEW YORK UNIVERSITY

By: /s/ Abram M. Goldfinger

Abram M. Goldfinger
Executive Director,
Industrial Liaison/Technology Transfer

Date: 11/20/13

CORPORATION

By: /s/ Erik Holmlin

Erik Holmlin
Title: President and CEO

Date: 19-NOV-2013

Appendix I

[…***…]

[…***…]

Appendix II

[…***…]

[…***…]

Appendix III

[…***…]

[…***…]

CERTAIN INFORMATION CONTAINED IN THIS EXHIBIT, MARKED BY […*…], HAS BEEN EXCLUDED FROM THIS EXHIBIT BECAUSE THE REGISTRANT HAS DETERMINED THAT IT IS BOTH NOT MATERIAL AND IS THE TYPE THAT THE REGISTRANT TREATS AS PRIVATE OR CONFIDENTIAL.**

OPTION AND SUBLICENSE AGREEMENT

THIS OPTION AND SUBLICENSE AGREEMENT ("Agreement") dated as of February 2, 2016 ("Effective Date"), is entered into among Pacific Biosciences of California, Inc., a Delaware corporation having an address of 1380 Willow Rd., Menlo Park, CA 94025 ("PacBio") and BioNano Genomics, Inc., a Delaware corporation with its principal place of business located at 9640 Towne Centre Drive, Ste. 100, San Diego, CA 92121 ("BioNano").

W I T N E S S E T H

WHEREAS, PacBio controls certain patents related to analysis of nucleic acid molecules in nanofluidic channels; and

WHEREAS, BioNano desires to obtain a nonexclusive sublicense to such patents controlled by PacBio in order to develop, manufacture, have manufactured and commercially exploit products in the Territory in the Mapping Field as well as an option to obtain a royalty-bearing sublicense to such patents in the Territory in the Sequencing Field, and PacBio desires to grant such sublicense and option to BioNano, upon the terms and conditions set forth herein.

NOW, THEREFORE, in consideration of the foregoing premises and the mutual covenants herein contained, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties hereby agree as follows:

ARTICLE I DEFINITIONS

For purposes of this Agreement, the following terms when used with initial capital letters shall have the respective meanings set forth below.

1.1 "Acquisition" shall mean a transaction with a Third Party comprising a merger or reverse merger coupled with a change of control, a sale of substantially all assets relating to this Agreement, a stock purchase agreement or exchange of stock with a third party (other than an equity investment in original issue stock the primary purpose of which is financing BioNano, where the investor is not a company whose primary business includes nucleic acid sequencing or any affiliate of such company) resulting in a change in control of BioNano.

1.2 "Affiliate" of a Party shall mean any person, corporation, joint venture or other business entity which, directly or indirectly through one or more intermediaries, controls, is controlled by, or is under common control with such Party, as the case may be. As used in this Section 1.2, "control" shall mean: (a) to possess, directly or indirectly, the power to affirmatively direct the management and policies of such person, corporation, joint venture or other business entity, whether through ownership of voting securities or by contract relating to voting rights or corporate governance; or (b) direct or indirect beneficial ownership of fifty percent (50%) or

more of the voting share capital in such person, corporation, joint venture or other business entity.

1.3 "Mapping Field" shall mean detection in a NDS of sequence-related features of a polynucleotide molecule, [...***...].

1.4 "NDS" shall mean a nano-dimensioned structure having a hole or channel with at least one dimension that is between […***…]. For clarity, […***…].

1.5 "Party" shall mean PacBio or BioNano (together, the "Parties").

1.6 "Sequencing Field" shall mean detecting and sequentially identifying each nucleotide of the sequence of a polynucleotide molecule in a NDS […***…].

1.7 "Sublicensed Patents" shall mean the patents set forth on Exhibit 1.7.

1.8 "Territory" shall mean the entire world.

1.9 "Third Party" shall mean any person, corporation, joint venture or other business entity, other than BioNano, PacBio and their respective Affiliates.

1.10 Additional Definitions. Each of the following definitions shall have the meanings defined in the corresponding sections of this Agreement indicated below.

Defined Term	**Section**
Agreement	Preamble
BioNano	Preamble
[***]	3.3
Disclosing Party	6.1
Effective Date	Preamble
[…***…]	3.3
Infringement	7.2
Losses	10.1
Mapping Products	2.1
Net Sales	Exhibit 2.4 (A)
PacBio	Preamble
Proprietary Information	6.1
Recipient	6.1
Sequencing Field Option	2.4
Sequencing Products	2.4

ARTICLE II

GRANT OF SUBLICENSE; OPTION

2.1 Sublicense. Subject to the terms and conditions of this Agreement, PacBio hereby grants to BioNano a fully paid-up irrevocable nonexclusive sublicense under the Sublicensed Patents only, to import, make, have made, use, offer for sale and sell products and services, solely in the Mapping Field ("Mapping Products"), and to allow its ultimate customers to use Mapping Products made and sold under the sublicense for their intended purpose solely in the Mapping Field.

2.2 Extension of Sublicense to Affiliates. BioNano may extend its rights under the sublicense granted in Section 2.1, and if the Sequencing Field Option is exercised, the sublicense granted under Section 2.4, to one or more of its Affiliates who agree (or for whom BioNano agrees) to assume the same obligations of BioNano under this

Agreement; provided that BioNano shall remain responsible to PacBio for such Affiliate's compliance with the obligations under this Agreement which apply to such Affiliate.

2.3 No Further Sublicensing. BioNano may not grant sublicenses to Third Parties under the sublicense granted in Section 2.1 or, if granted, the sublicense granted in Section 2.4.

2.4 Sequencing Field Option. Subject to the terms and conditions of this Agreement, PacBio hereby grants to BioNano a nonexclusive option (the "Sequencing Field Option") to obtain a nonexclusive sublicense under the Sublicensed Patents only, to import, make, have made, use, offer for sale and sell products and services, solely in the Sequencing Field

("Sequencing Products"), and to allow its ultimate customers to use Sequencing Products made and sold under the sublicense for their intended purpose solely in the Sequencing Field.BioNano may exercise the Sequencing Field Option at any time during the Term by providing written notice to PacBio and payment of the option exercise fee set forth in Section 4.2. Upon such exercise and payment of the option exercise fee, PacBio will automatically grant to BioNano a royalty-bearing, nonexclusive sublicense under the Sublicensed Patents, to import, make, have made, use, offer for sale and sell products and services, solely in the Sequencing Field, and to allow its ultimate customers to use products made and sold under the sublicense for their intended purpose solely in the Sequencing Field. The financial terms and conditions of such royalty bearing sublicense are set forth on Exhibit 2.4 to this Agreement.

2.5 No Other Rights. Except as expressly granted herein, neither Party, by implication, estoppel, reliance or otherwise, grants any license or other right under its intellectual property to the other Party. No license or other right to any patents, except those included in the Sublicensed Patents, are conveyed by PacBio.

ARTICLE III

DEVELOPMENT AND COMMERCIALIZATION OF PRODUCTS

3.1 General Responsibilities. BioNano will be responsible for the development and commercialization of Mapping Products and Sequencing Products as it deems appropriate in its sole discretion.

3.2 Marking Products; […***…] License.

(a) Patent Marking. BioNano shall mark Mapping Products and, after the exercise of the Sequencing Field Option, Sequencing Products (or their containers or labels) made, sold, leased, imported, exported or otherwise disposed of by it or its Affiliates under the sublicense(s) granted in this Agreement with the numbers of the applicable Sublicensed Patent(s); provided that such patent notice shall be in accordance with the laws concerning the marking of patented articles in the country in which such articles are sold.

(b) […***…] License. Beginning immediately after the Effective Date for Mapping Products and after the exercise of the Sequencing Field Option for Sequencing Products, BioNano shall […***…] that it sells or offers for sale or otherwise commercializes, with […***…], and shall include […***…] shall (A) be in the form attached hereto as Exhibit 3.2 or (B) such other form approved by PacBio that […***…] and is limited to the Mapping Field or Sequencing Field, as applicable. If applicable law or regulation requires in order for the restrictions of such […***…] to be enforceable that any such form(s) be modified, the Parties agree to so modify such form(s). For the avoidance of doubt, inclusion of such […***…] in the manual associated with a Mapping Product or Sequencing Product shall be considered […***…] such Product for purpose of the preceding sentence. In connection with clause (B), BioNano shall provide to PacBio, for its review and approval, any such other form of […***…] and PacBio shall respond (with its approval or with requested changes) within […***…] thereafter, or shall be deemed to have approved such language for purposes of this Section 3.2.

3.3 Use of […***…] Names. BioNano shall not use, nor shall BioNano permit any of its Affiliates to use, the names, trademarks and indicia of […***…] ("[…***…]") or of […***…] ("[…***…]"), nor the names of any employee, student or faculty member of […***…] nor of […***…], in connection with the activities contemplated under this Agreement, without prior written approval from […***…].

ARTICLE IV

UPFRONT AND OPTION PAYMENTS

4.1 Upfront Payment. Subject to the terms and conditions of this Agreement, in further consideration of the option and sublicense granted by PacBio to BioNano under this Agreement, BioNano shall pay to PacBio an upfront one-time payment of […***…], payable in […***…], with […***…] due and payable within […***…] after […***…] occurring after the Effective Date in which BioNano, its Affiliate(s) and/or its or their shareholders […***…], but no later than […***…] after the Effective Date. The […***…] shall be due and payable no later than […***…].

4.2 Option Exercise Fee. Subject to the terms and conditions of this Agreement, if BioNano exercises the Sequencing Field Option, BioNano shall pay to PacBio a one-time payment of […***…] payable within […***…] after providing written notice to PacBio of the exercise of the Sequencing Field Option.

ARTICLE V

PAYMENT TERMS

5.1 Payment Method. Unless otherwise expressly stated in this Agreement, all amounts specified in this Agreement shall be in United States dollars.

5.2 Withholding Taxes. All payments by BioNano to PacBio hereunder (including any royalty payments on Sequencing Products) shall be made free and clear of and without reduction for any taxes, duties or similar charges imposed by any government (other than taxes on the net income of PacBio), which shall be paid by BioNano. Accordingly, if BioNano is required to withhold any taxes on the amounts payable to PacBio hereunder, BioNano shall pay PacBio such additional amounts as are necessary to ensure receipt by PacBio of the full amount which PacBio would have received but for the deduction on account of such withholding. BioNano shall provide PacBio with official receipts issued by the appropriate governmental agency or such other evidence as is reasonably requested by PacBio to establish that such taxes have been paid. Each party shall provide the other party with such assistance as shall reasonably be requested in connection with any application to qualify for the benefit of a reduced rate of withholding taxation, under the terms of any income tax treaty between the United States of America and other jurisdictions.

ARTICLE VI

CONFIDENTIALITY

6.1 Proprietary Information. Except as otherwise provided in this Article 6, during the term of this Agreement and for a period of […***…] thereafter, each Party (the "Recipient") shall maintain in confidence and use only for purposes of this Agreement any confidential information, data and materials supplied to such Party by the other Party (the "Disclosing Party") under this Agreement; provided that, unless the confidentiality of any information, data or material is expressly provided in this Agreement, if any such information, data or materials are in tangible form, they are marked "Confidential" or "Proprietary," or if disclosed orally, they are identified as confidential or proprietary when disclosed and are confirmed in writing as confidential or proprietary within […***…] following such disclosure (such information, data and materials so disclosed, collectively "Proprietary Information"). The obligations of the Recipient under this Article 6 not to disclose or use Proprietary Information received from the Disclosing Party shall not apply, however, apply to the extent that any such information, data or materials:

(a) are or become generally available to the public, or otherwise part of the public domain, other than by acts or omissions of the Recipient in breach of this Agreement;

(b) are disclosed to the Recipient, other than under an obligation of confidentiality, by a Third Party who had no obligation to the Disclosing Party not to disclose such information to others;

(c) were already in the possession of the Recipient, other than under an obligation of confidentiality, prior to disclosure by the Disclosing Party; or

(d) is subsequently and independently developed by the Recipient without use of or reference to the Proprietary Information of the Disclosing Party.

6.2 Permitted Disclosures. To the extent it is reasonably necessary or appropriate to fulfill its obligations or exercise its rights under this Agreement:

(a) a Recipient may disclose Proprietary Information which it is otherwise obligated under this Article 6 not to disclose, to its Affiliates, employees, consultants, and outside contractors, on a need-to-know basis in accordance with the exercise of rights granted to such Recipient under this Agreement; provided that such persons agree to be bound by obligations of confidentiality with respect to such Proprietary Information which are substantially similar in scope and duration to those set forth in this Article 6; and

(b) a Recipient may disclose Proprietary Information of the Disclosing Party to government or other regulatory authorities to the extent that such disclosure is: (i) required by applicable law (including applicable securities law), government regulation or court order; or (ii) is reasonably necessary to Prosecute and Maintain any patent, to obtain any authorization to conduct clinical studies, or to obtain any U.S. Food & Drug Administration (or equivalent) marketing approval/clearance for a Mapping Product or Sequencing Product; provided that, in case of any disclosures required by law, the Recipient shall provide reasonable advance notice to the Disclosing Party to allow such Party to oppose such disclosure or to request confidential treatment of such Proprietary Information.

6.3 Nondisclosure of Terms. Each Party agrees not to disclose the terms of this Agreement to any Third Party without the prior written consent of the other Party, except: (a) to such Party's advisors (including financial advisors, attorneys and accountants), potential and existing investors and others on a need-to-know basis, in each case under appropriate confidentiality obligations which are substantially similar in scope and duration to those set forth in this Article 6; or (b) to the extent necessary to comply with applicable law (including applicable securities law), government regulation or court order; provided that the Party required to make such disclosure under (b) above shall promptly notify the other Party and (other than in the case where such disclosure is necessary to comply with applicable securities laws) allow such other Party a reasonable opportunity to oppose such disclosure and/or to seek limitations on the portion of the Agreement required to be disclosed.

ARTICLE VII

INTELLECTUAL PROPERTY AND INFRINGEMENT

7.1 Patent Maintenance.

(a) Allocation of Responsibilities. As between the Parties, PacBio shall have the sole right, but not the obligation, to control the prosecution and maintenance of the Sublicensed Patents in the Territory, using counsel selected by PacBio or its licensor.

(b) Maintenance Costs. BioNano will reimburse PacBio for all amounts due after the Effective Date for patent annuities for maintenance of the Sublicensed Patents in the United States, provided that such amounts shall be prorated if PacBio grants any Third Party a sublicense to the Sublicensed Patents in the Mapping Field or Sequencing Field.

7.2 Enforcement of Patents.

(a) Notice. In the event BioNano learns of any Third Party infringement of the Sublicensed Patents by the manufacture, use, sale, offer for sale or importation of a product in the Territory in the Mapping Field or the Sequencing Field, it shall promptly provide written notice to PacBio of such infringement and shall supply PacBio with all evidence it possesses pertaining to such infringement (an "Infringement").

(b) Infringement Action. As between the Parties, PacBio or its nominee shall have the sole right, but not the obligation, to seek to abate any Infringement of any Sublicensed Patent.

(c) Settlement and Recoveries. Any recovery obtained by PacBio as a result of an Infringement Action shall be retained solely by PacBio.

ARTICLE VIII

TERM AND TERMINATION

8.1 Term. This Agreement shall commence on the Effective Date and, unless terminated earlier pursuant to Sections 8.2, 8.3 or 8.4, shall continue in full force and effect until expiration of the last-to-expire patent among the Sublicensed Patents.

8.2 Termination for Material Breach. If either Party materially breaches this Agreement at any time, the non-breaching Party shall have the right to terminate this Agreement by written notice to the breaching Party, if such breach is not cured within thirty (30) days after written notice is given by the non-breaching Party to the breaching Party specifying the breach.

8.3 Termination by BioNano. This Agreement may be terminated by BioNano, in its sole discretion, in its entirety, upon sixty (60) days' prior written notice to PacBio.

8.4 Termination by PacBio. If BioNano has not paid PacBio the first installment payment of one hundred six thousand two hundred fifty dollars ($106,250) in accordance with Section 4.1 within three (3) months after the Effective Date, or if BioNano fails to pay the second, third or fourth installment payment by the respective due date set forth in Section 4.1, then PacBio shall have the right to terminate this Agreement, with immediate effect, by written notice to BioNano.

8.5 Effect of Expiration or Termination.

(a) Termination for Cause by PacBio or Termination by BioNano. Upon termination of this Agreement by PacBio or by BioNano in accordance with Section 8.2, or termination of this Agreement by BioNano in accordance with Section 8.3, or termination of this Agreement by PacBio in accordance with Section 8.4: the option, licenses and rights granted by PacBio to BioNano under Article 2 will immediately terminate; provided that BioNano shall remain responsible for, and shall pay, any and all payments due to PacBio under the terms of this Agreement as of the effective date of any such termination.

(b) Survival of Certain Obligations. Subject to Section 8.5, expiration or termination of this Agreement for any reason shall not relieve either Party of any obligation accruing on or prior to such expiration or termination, or which is attributable to a period prior to such expiration or termination, nor preclude either Party from pursuing any rights and remedies it may have under this Agreement, or at law or in equity, which accrued or are based upon any event occurring prior to such expiration or termination. The provisions of Articles 1, 6, 8, 10,. and 11 shall survive the expiration or termination of this Agreement for any reason.

ARTICLE IX

REPRESENTATIONS AND WARRANTIES

9.1 General Representations and Warranties. Each Party represents and warrants to the other Party that:

(a) it is a corporation duly organized and validly existing under the laws of the jurisdiction in which it is incorporated;

(b) it has full corporate power and authority, and has obtained all approvals, permits and consents necessary, to enter into this Agreement and to perform its obligations hereunder;

(c) this Agreement is legally binding upon it and enforceable in accordance with its terms; and

(d) the execution, delivery and performance of this Agreement does not conflict with any agreement, instrument or understanding, oral or written, to which it is a party or by which it may be bound, nor violate any material law or regulation of any governmental or regulatory authority having jurisdiction over it.

9.2 Additional Warranties of PacBio. PacBio hereby covenants, represents and warrants to BioNano that:

(a) as of the Effective Date, PacBio has a valid and enforceable written license from […***…] to the Sublicensed Patents; such license is in full force and effect; […***…] has not provided PacBio with any notice of breach of such license (except with regard to any breach that has been cured prior to the Effective Date); PacBio is in compliance with all material terms of such license; and […***…] has no current right to terminate such license;

(b) PacBio will maintain such license in effect until expiration or termination of this Agreement under Article VIII; and

(c) PacBio has all rights necessary to grant to BioNano the sublicenses and rights granted under this Agreement.

9.3 DISCLAIMER. EXCEPT AS OTHERWISE EXPRESSLY SET FORTH IN THIS AGREEMENT, NEITHER PARTY MAKES ANY REPRESENTATION OR EXTENDS ANY WARRANTIES OF ANY KIND EITHER EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, NON1NFRINGEMENT, OR VALIDITY OF ANY PATENTS ISSUED OR PENDING.

ARTICLE X

INDEMNIFICATION

10.1 Indemnification by BioNano. BioNano will indemnify and hold harmless PacBio and its Affiliates and their officers, directors, employees, agents, successors and assigns from and against any and all claims (including claims for death, illness, personal injury, property damage or improper business practices), liabilities, losses, damages, costs and expenses, interest, awards, judgments and penalties (including, without limitation, reasonable attorneys' fees and expenses) ("Losses") suffered or incurred by them arising out of or resulting from: (a) the manufacture, use, sale, or other disposition of Mapping Products or Sequencing Products by or on behalf of BioNano, any of its Affiliates, or their respective customers; (b) a Third Party's use of Mapping Products or Sequencing Products purchased, leased, or otherwise acquired from BioNano, any of its Affiliates, or their respective customers; (c) a Third Party's manufacture or provision of Mapping Products or Sequencing Products at the request of BioNano or any of its Affiliates.

10.2 Indemnification Procedures. In the event that PacBio intends to claim indemnification under this Article 10, PacBio shall promptly notify BioNano in writing of the alleged Losses. BioNano shall have the right to control the defense thereof with counsel of its choice as long as such counsel is reasonably acceptable to PacBio; provided, however, that PacBio shall have the right to retain its own counsel at its own expense, for any reason, including if representation of PacBio by the counsel retained by BioNano would be inappropriate due to actual or potential differing interests between such PacBio and any other party represented by such counsel in such proceeding. PacBio shall cooperate with BioNano and its legal representatives in the investigation of any Losses covered by this Article 10. PacBio shall not, except at its own cost, voluntarily make any payment or incur any expense with respect to any claim or suit without the prior written consent of BioNano, which BioNano shall not be required to give.

10.3 Workers' Compensation Insurance. BioNano shall at all times comply, through insurance or self-insurance, with all statutory workers' compensation and employers' liability requirements covering any and all employees with respect to activities performed under this Agreement.

10.4 Liability Insurance. BioNano agrees to obtain and maintain insurance against liability, damage, destruction and loss comparable to that which is maintained by companies in similar businesses at similar stages in their growth.

ARTICLE XI

MISCELLANEOUS

11.1 Force Majeure. Neither Party shall be held liable or responsible to the other Party, nor be deemed to have defaulted under or breached this Agreement, for failure or delay in fulfilling or performing any term of this Agreement, other than the payment of money owed by BioNano, to the extent, and for so long as, such failure or delay is caused by or results from causes beyond the reasonable control of the affected Party, including fire, flood, embargo, power shortage or failure, war, act of war (whether war be declared or not), insurrection, riot, terrorism, civil commotion, strike, lockout or other labor disturbance, act of God or any act, omission or delay in acting by any governmental authority or the other Party.

11.2 Assignment. Except as provided in Section 11.3 of this Agreement, licenses granted to BioNano are personal, and this Agreement and any licenses or rights granted to BioNano may not be assigned or otherwise transferred by BioNano without the consent of PacBio, which consent shall not be unreasonably withheld, and any purported assignment of this Agreement by BioNano without PacBio's consent shall be null and void. Any permitted assignee shall assume all obligations of its assignor under this Agreement.

11.3 Acquisition of BioNano. In the event of an Acquisition of BioNano or of an Affiliate of BioNano, the sublicenses granted herein may be assigned to or assumed by the acquiring party without the consent of PacBio. However, in the event that the Sequencing Field Option has already been exercised at the time of the Acquisition, […***…]; otherwise, if and when the Sequencing Field Option is exercised after the Acquisition, the […***…]. Notwithstanding the foregoing, if BioNano's Affiliate is Acquired and such Affiliate is no longer an Affiliate of BioNano after such transaction, the sublicenses granted herein to such Affiliate will terminate.

11.4 Severability. If one or more provisions of this Agreement is held to be invalid, illegal or unenforceable, the Parties shall substitute, by mutual consent, valid provisions for such invalid, illegal or unenforceable provisions which valid provisions are, in their economic effect, sufficiently similar to the invalid provisions that it can be reasonably assumed that the Parties would have entered into this Agreement with such provisions. In the event that such provisions cannot be agreed upon, the invalidity, illegality or unenforceability of one or more provisions of the Agreement shall not affect the validity of this Agreement as a whole, unless the invalid provisions are of such essential importance to this Agreement that it is to be reasonably assumed that the Parties would not have entered into this Agreement without such invalid provisions.

11.5 Notices. Any notice, consent or report required or permitted to be given or made under this Agreement by one Party to the other Party shall be in English and in writing, delivered personally or by facsimile (receipt verified and a copy promptly sent by personal delivery, U.S. first class mail or express courier providing evidence of receipt, postage prepaid (where applicable)), or by U.S. first class mail or express courier providing evidence of receipt, postage prepaid (where applicable), at the following address for a Party (or such other address for a Party as may be specified by like notice):

To PacBio:

Pacific Biosciences of California, Inc.

1380 Willow Rd.

Menlo Park, CA 94025

Attention: Legal Department

Facsimile: (650) 323-9420

To BioNano:

BioNano Genomics, Inc.

9640 Towne Centre Drive, Ste. 100

San Diego, CA 92121

Attention: Chief Executive Officer

Facsimile: (858) 888-7601

All such notices, consents or reports shall be effective upon receipt.

11.6 Applicable Law. This Agreement shall be governed by and construed in accordance with the laws of State of California, without regard to the conflicts of law principles thereof. Any claim or dispute arising out of or related to this Agreement shall be subject to the sole jurisdiction and venue of the state and federal courts located in Santa Clara County.

11.7 LIMITATION OF LIABILITY. NEITHER PARTY SHALL BE LIABLE TO THE OTHER FOR ANY PUNITIVE, SPECIAL, CONSEQUENTIAL, INCIDENTAL OR INDIRECT DAMAGES ARISING OUT OF THIS AGREEMENT, HOWEVER CAUSED, UNDER ANY THEORY OF LIABILITY; PROVIDED HOWEVER THAT NOTHING IN THIS SECTION 11.7 SHALL BE DEEMED TO LIMIT THE INDEMNIFICATION OBLIGATIONS OF EITHER PARTY UNDER ARTICLE 10 TO THE EXTENT A THIRD PARTY RECOVERS ANY PUNITIVE, SPECIAL, CONSEQUENTIAL, INCIDENTAL OR INDIRECT DAMAGES FROM AN INDEMNITEE.

11.8 Entire Agreement. This Agreement (including the Exhibits attached hereto) contains the entire agreement by the Parties with respect to the subject matter hereof and supersede any prior and contemporaneous express or implied agreements, understandings and representations, either oral or written, which may have related to the subject matter hereof in any way.

11.9 Interpretation. The captions to the several Articles and Sections of this Agreement are not a part of this Agreement, but are included for convenience of reference and shall not affect its meaning or interpretation. In this Agreement: (a) the word "including" shall be deemed to be followed by the phrase "without limitation" or like expression; (b) the singular shall include the plural and *vice versa*; and (c) masculine, feminine and neuter pronouns and expressions shall be interchangeable. The Parties acknowledge and agree that they have selected the up-front, option and royalty payment structure for the Mapping Field and Sequencing Field, as described in this Agreement, as the most appropriate and convenient approach to determine the value of the sublicense to BioNano under the Sublicensed Patents, as described in this Agreement.

11.10 Independent Contractors. It is expressly agreed that PacBio and BioNano shall be independent contractors and that the relationship between the two Parties shall not constitute a partnership, joint venture or agency or fiduciary relationship. Neither PacBio nor BioNano shall have the authority to make any statements, representations or commitments of any kind, or to take any action, which shall be binding on the other Party, without the prior written consent of the other Party to do so.

11.11 Waiver; Amendment. Except as otherwise expressly provided in this Agreement, any term of this Agreement may be waived only by a written instrument executed by a duly authorized representative of the Party waiving compliance. The delay or failure of any Party at any time to require performance of any provision of this Agreement shall in no manner affect such Party's rights at a later time to enforce the same. This Agreement may be amended, and any term of this Agreement may be modified, only by a written instrument executed by a duly authorized representative of each Party.

11.12 Counterparts. This Agreement may be executed in two (2) or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

11.13 Binding Effect. This Agreement shall be binding upon and inure to the benefit of the Parties and their respective legal representatives, successors and permitted assigns.

[Remainder of page intentionally left blank.]

IN WITNESS WHEREOF, the Parties have executed this Agreement as of the date first set forth above.

PACIFIC BIOSCIENCES OF CALIFORNIA, INC.

BY: /s/ Stephen M. Moore

NAME: Stephen M. Moore
TITLE: Vice President & General Counsel

BIONANO GENOMICS, INC.

BY: /s/ R. Erik Holmlin

NAME: R. Erik Holmlin
TITLE: President & CEO

EXHIBIT 1.7

Sublicensed Patents

Family	Patent No.	Title
1	[***]	[***]
2	[***]	[***]
	[*]**	**[***]**
	[*]**	**[***]**
3	[***]	[***]
4	[***]	[***]
	[*]**	**[***]**
5	[***]	[***]
	[*]**	**] ***]**

EXHIBIT 2.4

Financial Provisions for Sequencing Products

A. "Net Sales" shall mean […***…].

Each of the foregoing […***…].

Net Sales also includes the […***…].

B. Royalty Payments.

(a) Royalty Rate. Subject to the terms and conditions of this Agreement, if BioNano exercises the Sequencing Field Option, BioNano shall pay to PacBio a royalty of […***…].

(b) Currency Conversion. If any currency conversion shall be required in connection with the payment of any royalties under this Agreement, such conversion shall be made by using the average of the exchange rates for the purchase and sale of United States Dollars […***…].

(c) One Royalty. No more than one royalty payment shall be due with respect to a sale of a particular unit of Sequencing Product.

(d) Royalty Payment Terms. Royalties with respect to Net Sales for a given […***…] shall be due and payable on […***…]. Late payments shall be subject to a per annum interest charge equal […***…].

C. Reporting.

(a) Commencing on the first commercial sale of a Sequencing Product in any country in the Territory, BioNano shall furnish to PacBio a written report for each calendar quarter during the term of this Agreement showing:

(i) […***…] of all Sequencing Products sold by BioNano and its Affiliates in the Territory during such calendar quarter and […***…];

(ii) the royalties, payable in United States Dollars, which shall have accrued under this Agreement based upon such Net Sales of the Sequencing Products;

(iii) […***…] not previously reported; and

(iv) the exchange rates used in determining the amount of royalties payable in United States Dollars, as more specifically provided in Section B(b) above.

(b) Reports to be provided by BioNano to PacBio shall be due […***…] following the close of each calendar quarter.

D. No Royalty Avoidance. BioNano agrees that it will not intentionally structure its Net Sales or the consideration or compensation that it receives or is entitled to receive in such a way as to avoid any payment that would otherwise be due to PacBio under this Agreement.

E. Records. BioNano shall keep and maintain, and shall require that its Affiliates keep and maintain, any and all records necessary to certify compliance of BioNano and its Affiliates with this Agreement, including but not limited to accounting general ledgers, distributor agreements, price lists, catalogs, marketing materials, audited financial statements, income tax returns, sales tax returns, inventory records, and shipping documents of Licensed Products. […***…], which shall not unreasonably withhold such acceptance. As between the Parties, […***…]. However, if the results of any […***…] reveal additional royalties owed to PacBio that differ by more the […***…] from those royalties already paid, BioNano shall […***…]. PacBio agrees to hold such records confidential, […***…]. The records required by this paragraph shall be maintained and available for inspection for a period of […***…] following the calendar quarter to which they pertain. This paragraph shall survive termination of this Agreement.

EXHIBIT 3.2

[…*…] Licenses**

Mapping Field

[…***…]

Sequencing Field

[…***…]

Exhibit 31.1

CERTIFICATION

I, R. Erik Holmlin, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Bionano Genomics, Inc., a Delaware corporation (the "registrant");
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
    i. 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;
    ii. 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;
    iii. 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
    iv. Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
    i. 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
    ii. 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: August 7, 2024

/s/ R. Erik Holmlin, Ph.D.
R. Erik Holmlin, Ph.D.
President and Chief Executive Officer
(Principal Executive Officer)

Exhibit 31.2

CERTIFICATION

I, Gülsen Kama, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Bionano Genomics, Inc., a Delaware corporation (the "registrant");
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
    i. 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;
    ii. 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;
    iii. 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
    iv. Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
    i. 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
    ii. 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: August 7, 2024

/s/ Gülsen Kama

Gülsen Kama

Chief Financial Officer

(Principal Financial and Accounting Officer)

Exhibit 32.1

CERTIFICATION

Pursuant to the requirement set forth in Rule 13a-14(b) of the Securities Exchange Act of 1934, as amended, (the "Exchange Act") and 18 U.S.C. Section 1350 as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, R. Erik Holmlin, Chief Executive Officer of Bionano Genomics, Inc., a Delaware corporation (the "Company") and Gülsen Kama, Chief Financial Officer of the Company, each hereby certifies that, to the best of their knowledge:

1. The Company's Quarterly Report on Form 10-Q for the period ended June 30, 2024, as filed with the Securities and Exchange Commission on the date hereof (the "Periodic Report"), and to which this Certification is attached as Exhibit 32.1, fully complies with the requirements of Section 13(a) or Section 15(d) of the Exchange Act; and

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

Dated: August 7, 2024

/s/ R. Erik Holmlin, Ph.D.
R. Erik Holmlin, Ph.D.
President and Chief Executive Officer
(Principal Executive Officer)

Dated: August 7, 2024

/s/ Gülsen Kama
Gülsen Kama
Chief Financial Officer
(*Principal Financial and Accounting Officer*)

This certification accompanies and is being "furnished" with the Periodic Report, shall not be deemed "filed" by the Company for purposes of Section 18 of the Exchange Act, or otherwise subject to liability under that Section and shall not be deemed to be incorporated by reference into any filing of the Company under the Securities Act of 1933, as amended, or the Exchange Act, whether made before or after the date of the Periodic Report, irrespective of any general incorporation language contained in such filing.