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

FORM 10-Q

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

For the quarterly period ended June 30, 2023

OR

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

For the transition period from _____ to _____.

Commission File Number: 001-36042

PRECIGEN, INC.
(Exact name of registrant as specified in its charter)

Virginia	**26-0084895**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification Number)**
20374 Seneca Meadows Parkway Germantown, Maryland	**20876**
(Address of principal executive offices)	**(Zip Code)**

(301) 556-9900
(Registrant's telephone number, including area code)

N/A
(Former name, former address and former fiscal year, if changed since last report)

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

Title of each class	**Trading Symbol(s)**	**Name of each exchange on which registered**
Common Stock, no par value	PGEN	Nasdaq Global Select Market

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

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

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

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

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

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

As of July 31, 2023, 255,482,753 shares of common stock, no par value per share, were issued and outstanding.

PRECIGEN, INC.

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Special Note Regarding Forward-Looking Statements

This Quarterly Report contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995, which statements involve substantial risks and uncertainties. All statements, other than statements of historical facts, included in this Quarterly Report, including statements regarding our strategy; future events, including their outcome or timing; future operations; future financial position; future revenue; projected costs; prospects; plans; objectives of management; and expected market growth, are forward-looking statements. The words "aim", "anticipate", "assume", "believe", "continue", "could", "due", "estimate", "expect", "intend", "may", "plan", "positioned", "potential", "predict", "project", "seek", "should", "target", "will", "would", and the negatives of these terms or similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words. These statements may relate to, among other things: (i) the timeliness of regulatory approvals; (ii) our strategy and overall approach to our business model, our efforts to realign our business, and our ability to exercise more control and ownership over the development process and commercialization path; (iii) our ability to successfully enter new markets or develop additional product candidates, including the expected timing and results of investigational studies and preclinical and clinical trials, whether with our collaborators or independently; (iv) our ability to consistently manufacture our product candidates on a timely basis or to establish agreements with third-party manufacturers; (v) our ability to successfully enter into optimal strategic relationships with our subsidiaries and operating companies that we may form in the future; (vi) our ability to hold or generate significant operating capital, including through partnering, asset sales, and operating cost reductions; (vii) actual or anticipated variations in our operating results; (viii) actual or anticipated fluctuations in competitors' or collaborators' operating results or changes in their respective growth rates; (ix) our cash position; (x) market conditions in our industry; (xi) the volatility of our stock price; (xii) the ability, and the ability of our collaborators, to protect our intellectual property and other proprietary rights and technologies; (xiii) outcomes of pending and future litigation; (xiv) the rate and degree of market acceptance of any products developed by us, our subsidiaries, collaborations, or joint ventures, or JVs, and competition from existing technologies and products or new technologies and products that may emerge; (xv) our ability to retain and recruit key personnel; (xvi) expectations related to the use of proceeds from public offerings and other financing efforts; and (xvii) estimates regarding expenses, future revenue, capital requirements, and needs for additional financing.

Forward-looking statements are based on our beliefs, assumptions, and expectations of our future performance, and may also concern our expectations relating to our subsidiaries and other affiliates. We caution you that the foregoing list may not contain all of the forward-looking statements made in this Quarterly Report.

We may not actually achieve the plans, intentions, or expectations disclosed in our forward-looking statements, and you should not place undue reliance on our forward-looking statements. Actual results or events could differ materially from the plans, intentions, and expectations disclosed in the forward-looking statements we make. We have included important factors in the cautionary statements included in this Quarterly Report, particularly in Part II, Item 1A, "Risk Factors," that could cause actual results or events to differ materially from the forward-looking statements that we make. Our forward-looking statements do not reflect the potential impact of any future acquisitions, mergers, dispositions, JVs, or investments that we may make.

You should read this Quarterly Report, the documents that we reference in this Quarterly Report, our Annual Report on Form 10-K for the year ended December 31, 2022, the other reports we have filed with the Securities and Exchange Commission, or SEC, and the documents that we have filed as exhibits to our filings with the SEC completely and with the understanding that our actual future results may be materially different from what we expect. We do not assume any obligation to update any forward-looking statements, whether as a result of new information, future events or otherwise, except as required by law.

PART I. FINANCIAL INFORMATION

Item 1. Condensed Consolidated Financial Statements

Precigen, Inc. and Subsidiaries
Condensed Consolidated Balance Sheets
(Unaudited)

(Amounts in thousands, except share data)	June 30, 2023	December 31, 2022
Assets		
Current assets		
Cash and cash equivalents	$ 16,546	$ 4,858
Restricted cash	—	43,339
Short-term investments	71,888	51,092
Receivables		
Trade, less allowance for credit losses of $184 as of both June 30, 2023 and December 31, 2022	1,354	978
Other	13,052	12,826
Prepaid expenses and other	2,792	5,066
Total current assets	105,632	118,159
Long-term investments	7,127	—
Property, plant and equipment, net	6,574	7,329
Intangible assets, net	42,656	44,455
Goodwill	36,966	36,923
Right-of-use assets	7,623	8,086
Other assets	949	1,025
Total assets	$ 207,527	$ 215,977

The accompanying notes are an integral part of these condensed consolidated financial statements.

Precigen, Inc. and Subsidiaries
Condensed Consolidated Balance Sheets
(Unaudited)

(Amounts in thousands, except share data)	June 30, 2023	December 31, 2022
Liabilities and Shareholders' Equity		
Current liabilities		
Accounts payable	$ 2,510	$ 4,068
Accrued compensation and benefits	4,820	6,377
Other accrued liabilities	3,257	4,997
Settlement and Indemnification Accruals	18,750	18,750
Deferred revenue	15	25
Current portion of long-term debt	—	43,219
Current portion of lease liabilities	1,421	1,209
Total current liabilities	30,773	78,645
Deferred revenue, net of current portion	1,818	1,818
Lease liabilities, net of current portion	6,545	6,992
Deferred tax liabilities	2,181	2,263
Total liabilities	41,317	89,718
Commitments and contingencies (Note 14)		
Shareholders' equity		
Common stock, no par value, 400,000,000 shares authorized as of June 30, 2023 and December 31, 2022; 255,482,753 shares and 208,150,021 shares issued and outstanding as of June 30, 2023 and December 31, 2022, respectively	—	—
Additional paid-in capital	2,080,348	1,998,314
Accumulated deficit	(1,911,620)	(1,868,567)
Accumulated other comprehensive loss	(2,518)	(3,488)
Total shareholders' equity	166,210	126,259
Total liabilities and shareholders' equity	$ 207,527	$ 215,977

The accompanying notes are an integral part of these condensed consolidated financial statements.

Precigen, Inc. and Subsidiaries
Condensed Consolidated Statements of Operations
(Unaudited)

(Amounts in thousands, except share and per share data)	Three Months Ended June 30, 2023	Three Months Ended June 30, 2022	Six Months Ended June 30, 2023	Six Months Ended June 30, 2022
Revenues				
Product revenues	$ 324	$ 621	648	1,113
Service revenues	1,438	2,213	2,965	7,146
Other revenues	5	77	5	165
Total revenues	1,767	2,911	3,618	8,424
Operating Expenses				
Cost of products and services	1,697	1,811	3,224	3,505
Research and development	11,874	11,954	24,037	23,755
Selling, general and administrative	9,316	12,670	20,954	26,359
Impairment of goodwill	—	—	—	482
Impairment of other noncurrent assets	—	638	—	638
Total operating expenses	22,887	27,073	48,215	54,739
Operating loss	(21,120)	(24,162)	(44,597)	(46,315)
Other income (Expense), Net				
Interest expense	(136)	(2,063)	(460)	(4,101)
Interest income	828	37	1,460	75
Other income, net	44	40	424	238
Total other income (expense), net	736	(1,986)	1,424	(3,788)
Equity in net loss of affiliates	—	—	—	(1)
Loss from continuing operations before income taxes	(20,384)	(26,148)	(43,173)	(50,104)
Income tax benefit	65	89	120	147
Loss from continuing operations	(20,319)	(26,059)	(43,053)	(49,957)
Income from discontinued operations, net of income taxes	—	8,424	—	13,071
Net loss	$ (20,319)	$ (17,635)	$ (43,053)	$ (36,886)
Net Loss per Share				
Net loss from continuing operations per share, basic and diluted	$ (0.08)	$ (0.13)	$ (0.18)	$ (0.25)
Net income from discontinued operations per share, basic and diluted	—	0.04	—	0.07
Net loss per share, basic and diluted	$ (0.08)	$ (0.09)	$ (0.18)	$ (0.18)
Weighted average shares outstanding, basic and diluted	248,003,322	200,461,441	240,307,403	200,047,629

The accompanying notes are an integral part of these condensed consolidated financial statements.

Precigen, Inc. and Subsidiaries
Condensed Consolidated Statements of Comprehensive Loss
(Unaudited)

(Amounts in thousands)	Three Months Ended June 30, 2023	Three Months Ended June 30, 2022	Six Months Ended June 30, 2023	Six Months Ended June 30, 2022
Net loss	$ (20,319)	$ (17,635)	$ (43,053)	$ (36,886)
Other comprehensive income (loss):				
Unrealized gain (loss) on investments	228	(202)	491	(1,004)
Gain (loss) on foreign currency translation adjustments	(47)	(2,655)	479	(3,755)
Comprehensive loss	$ (20,138)	$ (20,492)	$ (42,083)	$ (41,645)

The accompanying notes are an integral part of these condensed consolidated financial statements.

Precigen, Inc. and Subsidiaries
Condensed Consolidated Statements of Shareholders' Equity
(Unaudited)

(Amounts in thousands, except share data)	Common Stock Shares	Common Stock Amount	Additional Paid-in Capital	Accumulated Other Comprehensive Income (Loss)	Accumulated Deficit	Total Shareholders' Equity
Balances at March 31, 2023	255,482,753	$ —	$ 2,078,133	$ (2,699)	$ (1,891,301)	$ 184,133
Stock-based compensation expense	—	—	2,188	—	—	2,188
Other	—	—	27	—	—	27
Net loss	—	—	—	—	(20,319)	(20,319)
Other comprehensive income	—	—	—	181	—	181
Balances at June 30, 2023	255,482,753	$ —	$ 2,080,348	$ (2,518)	$ (1,911,620)	$ 166,210

(Amounts in thousands, except share data)	Common Stock Shares	Common Stock Amount	Additional Paid-in Capital	Accumulated Other Comprehensive Income (Loss)	Accumulated Deficit	Total Shareholders' Equity
Balances at March 31, 2022	207,693,277	$ —	$ 1,991,670	$ (1,699)	$ (1,916,135)	$ 73,836
Stock-based compensation expense	—	—	2,309	—	—	2,309
Shares issued for accrued compensation	456,744	—	—	—	—	—
Net loss	—	—	—	—	(17,635)	(17,635)
Other comprehensive loss	—	—	—	(2,857)	—	(2,857)
Balances at June 30, 2022	208,150,021	$ —	$ 1,993,979	$ (4,556)	$ (1,933,770)	$ 55,653

The accompanying notes are an integral part of these condensed consolidated financial statements.

Precigen, Inc. and Subsidiaries
Condensed Consolidated Statements of Shareholders' Equity
(Unaudited)

(Amounts in thousands, except share data)	Common Stock Shares	Common Stock Amount	Additional Paid-in Capital	Accumulated Other Comprehensive Income (Loss)	Accumulated Deficit	Total Shareholders' Equity
Balances at December 31, 2022	208,150,021	$ —	$ 1,998,314	$ (3,488)	$ (1,868,567)	$ 126,259
Stock-based compensation expense	—	—	5,320	—	—	5,320
Shares issued upon vesting of restricted stock units and for exercises of stock options	697,815	—	—	—	—	—
Shares issued for accrued compensation	2,206,469	—	3,361	—	—	3,361
Shares issued as payment for services	465,808	—	545	—	—	545
Shares issued in public offering, net of issuance costs	43,962,640	—	72,808	—	—	72,808
Net loss	—	—	—	—	(43,053)	(43,053)
Other comprehensive income	—	—	—	970	—	970
Balances at June 30, 2023	255,482,753	$ —	$ 2,080,348	$ (2,518)	$ (1,911,620)	$ 166,210

(Amounts in thousands, except share data)	Common Stock Shares	Common Stock Amount	Additional Paid-in Capital	Accumulated Other Comprehensive Income (Loss)	Accumulated Deficit	Total Shareholders' Equity
Balances at December 31, 2021	206,739,874	$ —	$ 2,022,701	$ 203	$ (1,915,556)	$ 107,348
Cumulative effect of adoption of ASU 2020-06	—	—	(36,868)	—	18,672	(18,196)
Stock-based compensation expense	—	—	5,871	—	—	5,871
Shares issued upon vesting of restricted stock units and for exercises of stock options	354,089	—	1	—	—	1
Shares issued for accrued compensation	772,071	—	1,698	—	—	1,698
Shares issued as payment for services	283,987	—	576	—	—	576
Net loss	—	—	—	—	(36,886)	(36,886)
Other comprehensive loss	—	—	—	(4,759)	—	(4,759)
Balances at June 30, 2022	208,150,021	—	$ 1,993,979	$ (4,556)	$ (1,933,770)	$ 55,653

Precigen, Inc. and Subsidiaries
Condensed Consolidated Statements of Cash Flows
(Unaudited)

(Amounts in thousands)	Six Months Ended June 30, 2023	2022
Cash flows from operating activities		
Net loss	$ (43,053)	$ (36,886)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization	3,404	6,518
(Gain) Loss on disposals of assets, net	(40)	360
Impairment of goodwill	—	482
Impairment of other noncurrent assets	—	638
Gain on debt retirement	(60)	—
Amortization of (discounts) premiums on investments, net	(721)	468
Equity in net loss of affiliates	—	1
Stock-based compensation expense	5,320	5,871
Shares issued as payment for services	545	576
Provision for credit losses	—	735
Accretion of debt discount and amortization of deferred financing costs	60	596
Deferred income taxes	(113)	(112)
Other noncash items	1	105
Changes in operating assets and liabilities:		
Receivables:		
Trade	(376)	(7,016)
Other	(226)	10
Prepaid expenses and other	2,274	4,284
Other assets	83	2
Accounts payable	(1,537)	(963)
Accrued compensation and benefits	1,804	(1,015)
Other accrued liabilities	(1,740)	1,862
Deferred revenue	(10)	(2,184)
Lease liabilities	229	(40)
Related party payables	—	(78)
Other long-term liabilities	—	(50)
Net cash used in operating activities	(34,156)	(25,836)

The accompanying notes are an integral part of these condensed consolidated financial statements.

Precigen, Inc. and Subsidiaries
Condensed Consolidated Statements of Cash Flows
(Unaudited)

(Amounts in thousands)	Six Months Ended June 30, 2023	2022
Cash flows from investing activities		
Purchases of investments	$ (128,563)	$ —
Sales and maturities of investments	101,852	36,000
Purchases of property, plant and equipment	(255)	(3,297)
Proceeds from sale of assets	61	438
Net cash (used in) provided by investing activities	(26,905)	33,141
Cash flows from financing activities		
Proceeds from issuance of shares, net of issuance costs	72,808	—
Payments of long-term debt	(43,099)	(277)
Payments of cost to retire long-term debt	(120)	—
Proceeds from stock option exercises	—	1
Net cash provided by(used in) financing activities	29,589	(276)
Effect of exchange rate changes on cash, cash equivalents, and restricted cash	(172)	(471)
Net decrease in cash, cash equivalents, and restricted cash	(31,644)	6,558
Cash, cash equivalents, and restricted cash		
Beginning of period	48,596	43,343
End of period	$ 16,952	$ 49,901
Supplemental disclosure of cash flow information		
Cash paid during the period for interest	$ 1,156	$ 3,568
Significant noncash activities		
Accrued compensation paid in equity awards	$ 3,361	$ 1,698
Purchases of property and equipment included in accounts payable and other accrued liabilities	19	234
Proceeds from sale of assets included in accounts receivable	—	147

The following table provides a reconciliation of the cash, cash equivalents, and restricted cash balances as of June 30, 2023 and December 31, 2022 as shown above:

	June 30, 2023	December 31, 2022
Cash and cash equivalents	$ 16,546	$ 4,858
Restricted cash	—	43,339
Restricted cash included in other assets	406	399
Cash, cash equivalents, and restricted cash	$ 16,952	$ 48,596

The accompanying notes are an integral part of these condensed consolidated financial statements.

Precigen, Inc. and Subsidiaries
Notes to the Condensed Consolidated Financial Statements
(Unaudited)
(Amounts in thousands, except share and per share data)

1. Organization

Precigen, Inc. ("Precigen"), a Virginia corporation, is a dedicated discovery and clinical-stage biopharmaceutical company advancing the next generation of gene and cell therapies with the overall goal of improving outcomes for patients with significant unmet medical needs. Precigen is leveraging its proprietary technology platforms to develop product candidates designed to target urgent and intractable diseases in its core therapeutic areas of immuno-oncology, autoimmune disorders, and infectious diseases. Precigen has developed an extensive pipeline of therapies across multiple indications within these core focus areas. Precigen's primary operations are located in the State of Maryland.

Precigen also has two wholly owned operating subsidiaries. Precigen ActoBio, Inc. ("ActoBio"), and Exemplar Genetics,LLC, doing business as Precigen Exemplar ("Exemplar").

ActoBio is pioneering a proprietary class of microbe-based biopharmaceuticals that enable expression and local delivery of disease-modifying therapeutics, with its primary operations located in Ghent, Belgium.

Exemplar is committed to enabling the study of life-threatening human diseases through the development of MiniSwine Yucatan miniature pig research models and services, as well as enabling the production of cells and organs in its genetically engineered swine for regenerative medicine applications. Exemplar's primary operations are located in the State of Iowa.

Precigen and its consolidated subsidiaries are hereinafter referred to as the "Company."

2. Summary of Significant Accounting Policies

Basis of Presentation

The accompanying condensed consolidated financial statements are unaudited and have been prepared in accordance with accounting principles generally accepted in the United States of America ("U.S. GAAP"). Certain information and footnote disclosures normally included in the Company's annual financial statements have been condensed or omitted. These interim condensed consolidated financial statements, in the opinion of management, reflect all normal recurring adjustments necessary for fair statement of the Company's financial position as of June 30, 2023 and results of operations and cash flows for the interim periods ended June 30, 2023 and 2022. The year-end condensed consolidated balance sheet data was derived from the Company's audited financial statements but does not include all disclosures required by U.S. GAAP. These interim financial results are not necessarily indicative of the results to be expected for the year ending December 31, 2023, or for any other future annual or interim period. The accompanying 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, 2022.

The accompanying condensed consolidated financial statements reflect the operations of Precigen and its majority-owned subsidiaries. All intercompany accounts and transactions have been eliminated.

Liquidity

Management believes that existing liquid assets as of June 30, 2023 will allow the Company to continue its operations for at least a year from the issuance date of these condensed consolidated financial statements. These condensed consolidated financial statements are presented in United States dollars. Additionally, the condensed consolidated financial statements have been prepared on a going concern basis, which contemplates the realization of assets and the satisfaction of liabilities in the normal course of business. During the six months ended June 30, 2023, the Company incurred a net loss of $43,053 and, as of June 30, 2023, had an accumulated deficit of $1,911,620. Management expects operating losses and negative cash flows to continue for the foreseeable future and, as a result, the Company will require additional capital to fund its operations and execute its business plan. In the absence of a significant source of recurring revenue, the Company's long-term success is dependent upon its ability to continue to raise additional capital in order to fund ongoing research and development (which could occur through debt or equity issuances, sales or partnerships of non-core assets, collaborations or out-licensing of core or non-core assets, or other transactions), obtain regulatory approval of its therapeutic product candidates, successfully commercialize its therapeutic product candidates, generate revenue, meet its obligations and, ultimately, attain profitable operations.

Risks and Uncertainties

The Company is subject to a number of risks similar to those of other companies conducting high-risk, early-stage research and development of therapeutic product candidates. Principal among these risks are dependence on key individuals and intellectual property, competition from other products and companies, and the technical risks associated with the successful research, development, and clinical manufacturing of its and its collaborators' therapeutic product candidates.

Research and Development

The Company considers that regulatory requirements inherent in the research and development of new products preclude it from capitalizing such costs. Research and development expenses include salaries and related costs of research and development personnel, including stock-based compensation expense, costs to acquire technology rights, contract research organizations and consultants, facilities, materials and supplies associated with research and development projects as well as various laboratory studies. Costs incurred in conjunction with collaboration and licensing arrangements are included in research and development. Indirect research and development costs include depreciation, amortization, and other indirect overhead expenses.

The Company has research and development arrangements with third parties that include upfront and milestone payments. As of June 30, 2023 and December 31, 2022, the Company had research and development commitments with third parties that had not yet been incurred totaling $19,525 and $19,909, respectively. The commitments are generally cancellable by the Company by providing written notice at least sixty days before the desire termination date.

Cash and Cash Equivalents

All highly liquid investments with an original maturity of three months or less at the date of purchase are considered to be cash equivalents. Cash balances at a limited number of banks may periodically exceed insurable amounts. The Company believes that it mitigates its risk by investing in or through major financial institutions. Recoverability of investments is dependent upon the performance of the issuer. As of June 30, 2023 and December 31, 2022, the Company had cash equivalent investments in highly liquid money market accounts at major financial institutions of $11,390 and $3, respectively, which are included in cash and cash equivalents in the accompanying consolidated balance sheets.

Restricted Cash

Included in the condensed consolidated balance sheet as of December 31, 2022, is restricted cash of $43,339. This cash was restricted for the permitted purposes related to our Convertible Notes, including the resolution of such notes.

Short-term and Long-Term Investments

As of June 30, 2023 and December 31, 2022 short-term and long-term investments include United States government debt and agency securities and certificates of deposit. The Company determines the appropriate classification as short-term or long-term at the time of purchase based on original maturities and management's reasonable expectation of sales and redemption. The Company reevaluates such classification at each balance sheet date.

Fair Value of Financial Instruments

Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. As such, fair value is a market-based measurement that should be determined based on assumptions that market participants would use in pricing an asset and liability. As a basis for considering such assumptions, the Company uses a three-tier fair value hierarchy that prioritizes the inputs used in its fair value measurements. The hierarchy gives the highest priority to unadjusted quoted prices in active markets for identical assets or liabilities (Level 1 measurements) and the lowest priority to unobservable inputs (Level 3 measurements). The three levels of the fair value hierarchy are as follows:

Level 1:	Quoted prices in active markets for identical assets and liabilities;
Level 2:	Other than quoted prices included in Level 1 inputs that are observable for the asset or liability, either directly or indirectly; and
Level 3:	Unobservable inputs for the asset or liability used to measure fair value to the extent that observable inputs are not available.

Net Loss per Share

Basic net loss per share is calculated by dividing net loss attributable to common shareholders by the weighted average shares outstanding during the period, without consideration of common stock equivalents. Diluted net loss per share is calculated by adjusting weighted average shares outstanding for the dilutive effect of common stock equivalents outstanding for the period, using the treasury-stock method and the if-converted method. For purposes of the diluted net loss per share calculation, shares to be issued pursuant to convertible debt, stock options, RSUs, and warrants are considered to be common stock equivalents but are excluded from the calculation of diluted net loss per share because their effect would be anti-dilutive as described in the next paragraph. Therefore, basic and diluted net loss per share were the same for all periods presented. See Note 11 for further discussion of the Company's Share Lending Agreement.

In accordance with Accounting Standards Codification (“ASC”) 260, the control number for determining whether including potential common shares in the diluted earnings per share, or EPS, computation would be anti-dilutive is income (loss) from continuing operations. As a result, if there is a loss from continuing operations, diluted EPS would be computed in the same manner as basic EPS is computed, even if the entity has net income after including discontinued operations. The following potentially dilutive securities as of June 30, 2023 and 2022, have been excluded from the above computations of diluted weighted average shares outstanding for the three and six months then ended as they would have been anti-dilutive:

	June 30,	
	2023	**2022**
Options	22,325,095	15,492,339
Restricted stock units	1,877,308	714,687
Warrants	—	121,888
Total	24,202,403	16,328,914

In addition, the Company's Convertible Notes, prior to their retirement in the second quarter of 2023, were convertible at an exercise price of approximately $17.05 per share of common stock, representing approximately 11,732,440 shares at June 30, 2022. The shares underlying the Convertible Notes were considered for the dilutive calculation but were excluded in all periods presented as their effect was anti-dilutive. See Note 9 for further discussion of the Convertible Notes.

Segment Information

The Company's chief operating decision maker ("CODM") regularly reviews disaggregated financial information for various operating segments. The financial information regularly reviewed by the CODM consists of (i) Biopharmaceuticals and (ii) Exemplar, each an operating segment that was also determined to be a reportable segment. The Biopharmaceuticals reportable segment is primarily comprised of the Company's legal entities of Precigen and ActoBio. See Note 1 for a description of Precigen, ActoBio and Exemplar. Prior to January 1, 2023, corporate expenses were not allocated to the segments and were managed at a consolidated level. Corporate expenses, include costs associated with general and administrative functions, including the Company's finance, accounting, legal, human resources, information technology, corporate communication, and investor relations functions. Corporate expenses exclude interest expense, depreciation and amortization, gain or loss on disposals of assets, stock-based compensation expense, loss on settlement agreement, and equity in net loss of affiliates and include unrealized and realized gains and losses on the Company's securities portfolio as well as dividend income. Beginning in the first quarter of 2023, the Company allocated certain corporate expenses to Precigen as its operations directly benefited from these expenditures, and are now included in the Biopharmaceuticals reportable segment. As presented in Note 15, the prior year period has been reclassified to conform to the current period’s presentation.

Use of Estimates

The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities at the

date of the financial statements, and the reported amounts of revenues and expenses during the reporting periods. Actual results could differ from those estimates.

Adopted Accounting Pronouncements

In August 2020, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") 2020-06, *Debt—Debt with Conversion and Other Options (Subtopic 470-20) and Derivatives and Hedging—Contracts in Entity's Own Equity (Subtopic 815-40)—Accounting for Convertible Instruments and Contracts in an Entity's Own Equity* ("ASU 2020-06"). Under ASU 2020-06, the embedded conversion features are no longer separated from the host contract for convertible instruments with conversion features that are not required to be accounted for as derivatives under Topic 815, or that do not result in substantial premiums accounted for as paid-in capital. Consequently, a convertible debt instrument will be accounted for as a single liability measured at its amortized cost, as long as no other features require bifurcation and recognition as derivatives. The new guidance also requires the if-converted method to be applied for all convertible instruments.

We adopted ASU 2020-06 on January 1, 2022 using the modified retrospective transition method, which resulted in an increase to our reported long-term debt outstanding, net of current portion, of $18,196, a decrease to our additional paid-in capital of $36,868, and a corresponding cumulative-effect reduction to our opening accumulated deficit of $18,672. The adoption of ASU 2020-06 was expected to reduce non-cash interest expense related to existing convertible debt outstanding by approximately $11,800 for the year ending December 31, 2022, and did not have an impact on our consolidated cash flows. The use of the if-converted method did not have an impact on our overall earnings per share calculation.

Recently Issued Accounting Pronouncements Not Yet Adopted

There are no accounting standards which have not yet been adopted that are expected to have a significant impact on our financial statements and related disclosures.

3. Discontinued Operations

Trans Ova

As part of the Company's strategic shift to becoming a healthcare company, in August 2022, the Company completed the sale of 100% of the issued and outstanding membership interests in its wholly-owned subsidiary, Trans Ova, to Spring Bidco LLC (the “Buyer”), a Delaware limited liability company for $170,000 and up to $10,000 in cash earn-out payments contingent upon the performance of Trans Ova in each of 2022 and 2023, consisting of $5,000 for each year (the “Transaction”). The Company received $162,306 in proceeds, net of certain transaction costs, on August 18, 2022, after giving effect to the preliminary closing purchase price adjustments. The final working capital adjustment of $936 was received in the fourth quarter of 2022. In February 2023, the buyer notified the Company that Trans Ova did not meet the financial measures required in 2022 in order to require the first $5,000 earn-out payment.

The Company elected to account for the contingent consideration arrangement as a gain contingency in accordance with ASC 450, Contingencies (Subtopic 450-30). Under this approach, the Company recognizes the contingent consideration receivable in earnings after the contingency is resolved. Accordingly, to determine the initial gain on the sale of Trans Ova, the Company did not include an amount related to the contingent consideration arrangement as part of the consideration received.

In connection with the Transaction, the Company held restricted cash in a segregated account to be used for certain permitted purposes, including resolution of the Company’s outstanding Convertible Notes which were retired in the second quarter of 2023, as discussed further in Note 9. In addition, the Company is required to indemnify the Buyer for certain expenses incurred post close (related to covenants and certain additional specified liabilities including certain patent infringement lawsuits), if incurred, in amounts not to exceed $5,750. Such indemnification was recorded as a reduction of the gain on divestiture in the third quarter of 2022, and is included in Settlement and Indemnification accruals as of June 30, 2023. To date, the Company has received an indemnification claim of $675 that has not been paid as of June 30, 2023.

The following table presents the financial results of discontinued operations related to Trans Ova for the three and six months ended June 30, 2022:

	Three months ended June 30,	Six Months Ended June 30,
	2022	
Product revenues	$ 8,940	$ 17,172
Service revenues	23,501	41,777
Total revenues	32,441	58,949
Cost of products and services	17,415	32,820
Research and development	908	1,867
Selling, general and administrative	6,124	12,011
Total operating expenses	24,447	46,698
Operating income	7,994	12,251
Other income, net	430	820
Income from discontinued operations	$ 8,424	$ 13,071

The following table presents the significant noncash items, purchases of property, plant and equipment, and proceeds from sales of assets for the discontinued operations related to Trans Ova for the six months ended June 30, 2022 that are included in the accompanying condensed consolidated statements of cash flows.

Adjustments to reconcile net income to net cash used in operating activities	
Depreciation and amortization	$ 2,765
Loss on disposal of assets	360
Stock-based compensation expense	68
Provision for credit losses	735
Cash flows from investing activities	
Purchases of property, plant and equipment	(2,629)
Proceeds from sale of assets	438
Cash flows from financing activities	
Payments of long-term debt	(225)

4. Collaboration and Licensing Revenue

The Company's collaborations and licensing agreements may provide for multiple promises to be satisfied by the Company and typically include a license to the Company's technology platforms, participation in collaboration committees, and performance of certain research and development services. Based on the nature of the promises in the Company's collaboration and licensing agreements, the Company typically combines most of its promises into a single performance obligation because the promises are highly interrelated and not individually distinct. Options to acquire additional services are considered to determine if they constitute material rights. At contract inception, the transaction price is typically the upfront payment received and is allocated to the performance obligations. The Company has determined the transaction price should be recognized as revenue based on its measure of progress under the agreement primarily based on inputs necessary to fulfill the performance obligation.

The Company determines whether collaborations and licensing agreements are individually significant for disclosure based on a number of factors, including total revenue recorded by the Company pursuant to collaboration and licensing agreements, collaborators or licensees with equity method investments, or other qualitative factors. Collaboration and licensing revenues generated from consolidated subsidiaries are eliminated in consolidation.

There were no material amounts recognized as revenue for the three and six months ended June 30, 2023 and 2022.

Alaunos License Agreement

On April 3, 2023, the Company entered into an amended and restated exclusive license agreement (the "License Agreement"), with Alaunos Therapeutics ("Alaunos"). The License Agreement amended and replaced the terms of the Exclusive License Agreement by and between the Company and Alaunos, dated October 5, 2018.

Pursuant to the terms of the License Agreement, the Company has granted Alaunos an exclusive, worldwide, royalty-free, sub-licensable license to research, develop and commercialize T-cell receptor products, designed for neoantigens for the treatment of cancer or the treatment and prevention of human papilloma virus, or HPV, to the extent that the primary reason for such treatment or prevention is to prevent cancer, which is referred to as the HPV Field. The Company has also granted Alaunos an exclusive, worldwide, royalty-free, sub-licensable license for certain patents relating to the Sleeping Beauty technology to research, develop and commercialize TCR Products for both neoantigens and shared antigens for the treatment of cancer and in the HPV Field. The Company also granted Alaunos certain non-exclusive rights with respect to shared antigens, NK cells and gamma delta T-cells. Alaunos will be solely responsible for all aspects of the research, development and commercialization of the exclusively licensed products for the treatment of cancer and will not be subject to a diligence obligation with respect to such efforts.

Pursuant to the License Agreement, Alaunos no longer has any rights to certain of the Company's technology including with respect to (i) products utilizing the Company's RheoSwitch® gene switch, or RTS to express IL-12, or the IL-12 Products, for the treatment of cancer, (ii) chimeric antigen receptor, or CAR, products including CD19 and BCMA, or (iii) products utilizing an additional construct that expresses RTS IL-12, or Gorilla IL-12 Products, for the treatment of cancer and in the HPV Field. In addition, the Company may research, develop and commercialize products for the treatment of cancer, outside of the products exclusively licensed to Alaunos. Alaunos will provide the Company with certain access to information and materials related to Alaunos's prior use of the Company's technologies that is no longer within the scope of the License Agreement.

In consideration of the licenses and other rights granted by the Company, Alaunos will pay the Company an annual license fee of $0.1 million. Neither Alaunos nor the Company will have any other obligations with respect to the payment of milestones or royalties on products developed in connection with the License Agreement.

The Company has agreed that, during the term of the License Agreement, it will not use the licensed intellectual property to research, develop or commercialize any exclusive product for the treatment of cancer. The License Agreement will terminate on a product-by-product and/or country-by-country basis upon the expiration of the last to expire patent claim for a licensed product. In addition, Alaunos may terminate the License Agreement on a country-by-country or program-by-program basis following written notice to the Company, and either party may terminate the License Agreement following notice of a material breach. The License Agreement also contains customary representations, warranties and covenants from Alaunos and the Company, as well as customary provisions related to indemnity, confidentiality and other matters.

Deferred Revenue

Deferred revenue primarily consists of upfront and milestone consideration received for the Company's collaboration and licensing agreements. Revenue is recognized as services are performed. The arrangements classified as long-term are not active while the respective counterparties evaluate the status of the project and its desired future development activities since the Company cannot reasonably estimate the amount of service to be performed over the next year.

As of June 30, 2023 and December 31, 2022, the Company had long-term deferred revenue for collaboration and licensing arrangements of $1,818, and deferred revenue classified as current related to prepaid products and services of $15 and $25, respectively.

5. Short-term and Long-term Investments

The Company's investments are classified as available-for-sale. The following table summarizes the amortized cost, gross unrealized gains and losses, and fair value of available-for-sale investments as of June 30, 2023:

	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Aggregate Fair Value
U.S. government debt securities	$ 73,047	$ 15	$ (276)	$ 72,786
U.S. agency securities	991	8	(13)	986
Certificates of deposit	5,247	—	(4)	5,243
Total	$ 79,285	$ 23	$ (293)	$ 79,015

The following table summarizes the amortized cost, gross unrealized gains and losses, and fair value of available-for-sale investments as of December 31, 2022:

	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Aggregate Fair Value
U.S. government debt securities	$ 51,755	$ —	$ (760)	$ 50,995
Certificates of deposit	97	—	—	97
Total	$ 51,852	$ —	$ (760)	$ 51,092

The estimated fair value of available-for-sale investments classified by their contractual maturities as of June 30, 2023 was:

Due within one year	$ 71,888
After one year through two years	7,127
Total	$ 79,015

Changes in market interest rates and bond yields cause certain investments to fall below their cost basis, resulting in unrealized losses on investments. We do not intend to sell these investments nor is it more likely than not that the Company will be required to sell these investments, prior to maturity or recovery of amortized cost.

6. Fair Value Measurements

The carrying amount of cash and cash equivalents, receivables, accounts payable, accrued compensation and benefits, other accrued liabilities, and related party payables approximate fair value due to the short maturity of these instruments.

Assets

The following table presents the placement in the fair value hierarchy of financial assets that are measured at fair value on a recurring basis as of June 30, 2023:

	Quoted Prices in Active Markets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	June 30, 2023
Assets				
U.S. government debt securities	$ —	$ 72,786	$ —	$ 72,786
U.S. agency securities		986		986
Certificates of deposit	—	5,243	—	5,243
Total	$ —	$ 79,015	$ —	$ 79,015

The following table presents the placement in the fair value hierarchy of financial assets that are measured at fair value on a recurring basis as of December 31, 2022:

	Quoted Prices in Active Markets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	December 31, 2022
Assets				
U.S. government debt securities	$ —	$ 50,995	$ —	$ 50,995
Certificates of deposit	—	97	—	97
Total	$ —	$ 51,092	$ —	$ 51,092

The method used to estimate the fair value of the Level 2 short-term and long-term debt investments in the tables above is based on professional pricing sources for identical or comparable instruments, rather than direct observations of quoted prices in active markets.

Liabilities

The calculated fair value of the Convertible Notes (Note 9) was approximately $43,000 as of December 31, 2022, and was based on the recent third-party trades of the instrument as of the balance sheet date. The fair value of the Convertible Notes is classified as Level 2 within the fair value hierarchy as there is not an active market for the Convertible Notes, however, third-party trades of the instrument are considered observable inputs. The Convertible Notes are reflected on the accompanying condensed consolidated balance sheets at amortized cost, which was $43,219 as of December 31, 2022.

See Note 8 for discussion of non-recurring fair value estimates used in calculating an impairment charge recorded during the six months ended June 30, 2022.

7. Property, Plant and Equipment, Net

Property, plant and equipment consist of the following:

	June 30, 2023	December 31, 2022
Land and land improvements	$ 164	$ 164
Buildings and building improvements	2,629	2,592
Furniture and fixtures	508	457
Equipment	18,541	18,006
Leasehold improvements	4,324	4,333
Breeding stock	138	123
Computer hardware and software	4,638	4,562
Construction and other assets in progress	106	531
	31,048	30,768
Less: Accumulated depreciation and amortization	(24,474)	(23,439)
Property, plant and equipment, net	$ 6,574	$ 7,329

Depreciation expense was $475 and $616 for the three months ended June 30, 2023 and 2022, respectively, and $981 and $1,269 for the six months ended June 30, 2023 and 2022, respectively.

8. Goodwill and Intangible Assets, Net

The changes in the carrying amount of goodwill for the six months ended June 30, 2023 were as follows:

Balance at December 31, 2022	$	36,923
Foreign currency translation adjustments		43
Balance at June 30, 2023	$	36,966

The Company had $14,483 of cumulative impairment losses as of both June 30, 2023 and December 31, 2022.

Intangible assets consist of the following as of June 30, 2023:

	Gross Carrying Amount	Accumulated Amortization	Net
Patents, developed technologies and know-how	$ 81,598	$ (38,942)	$ 42,656
Customer relationships	1,600	(1,600)	—
Trademarks	200	(200)	—
Total	$ 83,398	$ (40,742)	$ 42,656

Intangible assets consist of the following as of December 31, 2022:

	Gross Carrying Amount	Accumulated Amortization	Net
Patents, developed technologies and know-how	$ 80,892	$ (36,437)	$ 44,455
Customer relationships	1,600	(1,600)	—
Trademarks	200	(200)	—
Total	$ 82,692	$ (38,237)	$ 44,455

Amortization expense was $1,218 and $1,219 for the three months ended June 30, 2023 and 2022, respectively, and $2,423 and $2,484 for the six months ended June 30, 2023 and 2022, respectively.

9. Lines of Credit and Short-Term Debt

Lines of Credit

Exemplar has a $2,500 revolving line of credit that matures on October 31, 2023. As of June 30, 2023, the line of credit bears interest at a stated rate of 7.00% per annum. As of June 30, 2023 and December 31, 2022, there was no outstanding balance on the line of credit.

Short-Term Debt

As of December 31, 2022, $43,219 of short-term debt consisted solely of the Company's Convertible Notes.

Convertible Debt

Precigen Convertible Notes

In July 2018, Precigen completed a registered underwritten public offering of $200,000 aggregate principal amount of Convertible Notes and issued the Convertible Notes under an indenture between Precigen and The Bank of New York Mellon Trust Company, N.A., as trustee, as supplemented by the First Supplemental Indenture.

The Convertible Notes were senior unsecured obligations of Precigen and bore interest at a rate of 3.50% per year, payable semiannually in arrears on January 1 and July 1 of each year beginning on January 1, 2019. The Convertible Notes matured on

July 1, 2023, although certain notes were repurchased prior to maturity beginning in third quarter of 2022 (as discussed further below). On June 30, 2023, the Company re-purchased all remaining outstanding Convertible Notes at par plus accrued interest.

The net proceeds received from the issuance of the Convertible Notes were initially allocated between long-term debt, the liability component, in the amount of $143,723, and additional paid-in capital, the equity component, in the amount of $50,235. Additional paid-in capital was further reduced by $13,367 of deferred taxes resulting from the difference between the carrying amount and the tax basis of the Convertible Notes that is created by the equity component, which also resulted in deferred tax benefit recognized from the reversal of valuation allowances on the then current year domestic operating losses in the same amount.

As described in Note 2, the Company adopted ASU 2020-06 on January 1, 2022. Pursuant to ASU 2020-06, the equity components of the Convertible Notes separated from the debt components as required under the cash conversion model is required to be recombined into the Convertible Notes as a single instrument upon the adoption of ASU 2020-06. The Convertible Notes shall be accounted for as if the conversion option had not been separated. As the Company elected the modified retrospective approach, the difference between the accounting under the cash conversion model and new model after the adoption of ASU 2020-06 (i.e., the single debt instrument with no separation) was recorded as an adjustment on the adoption date (i.e., January 1, 2022) through accumulated deficit. Tax accounting consequences of the adoption also required the reversal of the previously reported deferred tax benefit on the date of adoption.

As discussed in Note 3, in connection with the sale of Trans Ova in 2022, the Company transferred a total of $200,000 into a segregated account to be used for certain permitted purposes, including resolution of the Company's outstanding Convertible Notes. During the year December 31, 2022 and subsequently, the Company executed open market purchases of a portion of the outstanding Convertible Notes. During the six months ended June 30, 2023, the Company retired, through open market purchases and payment upon maturity, $43,340 of principal balance and recorded a gain on extinguishment of debt of approximately $61, which was recorded within Other income (expense), net, within the condensed consolidated statements of operations. The Company had previously retired $156,660 of principal balance from purchases during the year ended December 31, 2022. As of June 30, 2023, no restricted cash remained in the segregated account noted above, as all of the Company's outstanding Convertible Notes had been retired.

The components of interest expense related to the Convertible Notes were as follows:

	Three Months Ended June 30,		Six Months Ended June 30,	
	2023	2022	2023	2022
Cash interest expense	$ 108	$ 1,750	$ 397	$ 3,500
Non-cash interest expense	26	312	60	596
Total interest expense	$ 134	$ 2,062	$ 457	$ 4,096

10. Income Taxes

For the three and six months ended June 30, 2023, the Company calculated its tax benefit using the estimated annual effective tax rate method. The rate is the ratio of estimated annual income tax expense related to estimated pretax loss from continuing operations, excluding significant unusual or infrequently occurring items. As a result of the pretax losses anticipated for the full year which are not benefited, this rate has been calculated and applied to the year-to-date interim period’s ordinary income or loss on a jurisdiction by jurisdiction basis to determine the income tax expense/benefit allocated to the year-to-date period. The annual effective tax rate is revised, if necessary, at the end of each interim period based on the Company’s most current best estimate. The Company recorded $65 and $120 of income tax benefit from continuing operations for the three and six months ended June 30, 2023, respectively. The effective tax rate differs from the U.S. statutory tax rate, primarily as a result of the change in valuation allowance required.

For the three and six months ended June 30, 2022, the Company calculated its tax benefit using an estimate of actual taxable income or loss for the period, rather than estimating the Company's annual effective income tax rate, as the Company was unable to reliably estimate its income for the full year. The Company recorded $89 and $147 of income tax benefit from continuing operations for the three and six months ended June 30, 2022, respectively. The effective tax rate differs from the U.S. statutory tax rate, primarily as a result of the change in valuation allowance required.

The Company's net deferred tax assets are offset by a valuation allowance due to the Company's history of net losses combined with an inability to confirm recovery of the tax benefits of the Company's tax attributes and other net deferred tax assets. A portion of the Company's tax attributes are subject to annual limitations under Section 382 of the Internal Revenue Code. In assessing the realizability of deferred tax assets, management considers whether it is more likely than not that some portion or all of the deferred tax assets will not be realized. The ultimate realization of deferred tax assets is dependent upon the generation of future taxable income during the periods in which those temporary differences become deductible. Management considers the scheduled reversal of deferred tax liabilities, projected future taxable income and tax planning strategies in making this assessment.

11. Shareholders' Equity

Issuances of Precigen Common Stock

In January 2023, the Company closed a public offering of 43,962,640 shares of its common stock, resulting in net proceeds of $72,808, after deducting underwriting discounts, fees, and other offering expenses. Of the 43,962,640 shares, 11,517,712 shares were purchased by related parties and their affiliates, including the Company's Chief Executive Officer, its Chairman of the Board of Directors and his affiliates, and certain other of the Company's officers.

We completed the offering of shares of common stock, utilizing a number of underwriters, with J.P. Morgan Securities LLC acting as representative of the underwriters. The services provided by JP Morgan Securities LLC were in the ordinary course of their role as lead underwriter, for which they received customary fees and commissions.

Share Lending Agreement

Concurrently with the offering of the Convertible Notes (Note 9), Precigen entered into a share lending agreement (the "Share Lending Agreement") with J.P. Morgan Securities LLC (the "Share Borrower") pursuant to which Precigen loaned and delivered 7,479,431 shares of its common stock (the "Borrowed Shares") to the Share Borrower. The Share Lending Agreement will terminate, and the Borrowed Shares will be returned to Precigen within five business days of such termination, upon (i) termination by the Share Borrower or (ii) the earliest to occur of (a) October 1, 2023 and (b) the date, if any, on which the Share Lending Agreement is either mutually terminated or terminated by one party upon a default by the other party. The Share Borrower maintains collateral in the form of cash or certain permitted non-cash collateral with a market value at least equal to the market value of the Borrowed Shares as security for the obligation of the Share Borrower to return the Borrowed Shares when required by the terms above. The Borrowed Shares were offered and sold to the public at a price of $13.37 per share under a registered offering (the "Borrowed Shares Offering"). Precigen did not receive any proceeds from the sale of the Borrowed Shares to the public or any lending fees from the Share Lending Agreement. The Share Borrower or its affiliates received all the proceeds from the sale of the Borrowed Shares to the public. Affiliates of Third Security purchased all of the shares of common stock in the Borrowed Shares Offering.

The Share Lending Agreement was entered into at fair value and met the requirements for equity classification. Therefore, the value is netted against the issuance of the Borrowed Shares in additional paid-in capital. Additionally, the Borrowed Shares are not included in the denominator for loss per share attributable to Precigen shareholders unless the Share Borrower defaults on the Share Lending Agreement.

At-the-Market Sales Agreement

On August 9, 2022, the Company entered into a Controlled Equity Offering Sales Agreement (the “Sales Agreement”) with Cantor Fitzgerald & Co. (the “Agent”), pursuant to which the Company may issue and sell from time to time shares of the Company’s common stock, no par value per share (the “Shares”), through the Agent. The offering and sale of up to $100,000 of the Shares has been registered under the Securities Act of 1933. The Company has no obligation to sell any of the Shares under the Sales Agreement, and may at any time suspend or terminate the offering of its common stock pursuant to the Sales Agreement upon notice and subject to other conditions. The Company intends to use the proceeds of any sales to fund the development of clinical and preclinical product candidates and for working capital and other general corporate purposes.

No shares were sold in connection with the Sales Agreement during the six months ended June 30, 2023 nor for the year ended December 31, 2022.

Components of Accumulated Other Comprehensive Loss

The components of accumulated other comprehensive loss are as follows:

	June 30, 2023	December 31, 2022
Unrealized loss on investments	$ (270)	$ (760)
Loss on foreign currency translation adjustments	(2,248)	(2,728)
Total accumulated other comprehensive loss	$ (2,518)	$ (3,488)

12. Share-Based Payments

The Company measures the fair value of stock options and restricted stock units ("RSUs") issued to employees and nonemployees as of the grant date for recognition of stock-based compensation expense. Stock-based compensation expense for employees and nonemployees is recognized over the requisite service period, which is typically the vesting period. Stock-based compensation costs included in the condensed consolidated statements of operations are presented below:

	Three Months Ended June 30,		Six Months Ended June 30,	
	2023	2022	2023	2022
Cost of products and services	$ 17	$ 30	$ 35	$ 63
Research and development	582	589	1,087	1,134
Selling, general and administrative	1,589	1,660	4,198	4,606
Discontinued operations	—	30	—	68
Total	$ 2,188	$ 2,309	$ 5,320	$ 5,871

Precigen Equity Incentive Plans

In August 2013, Precigen adopted the 2013 Omnibus Incentive Plan ("the 2013 Plan"), for employees and nonemployees pursuant to which Precigen's board of directors may grant share-based awards, including stock options, restricted stock units, shares of common stock and other awards, to employees, officers, consultants, advisors, and nonemployee directors. Upon the effectiveness of the 2023 Omnibus Incentive Plan in June 30, 2023, as discussed in the next paragraph, (the "2023 Plan"), no new awards may be granted under the 2013 Plan and any awards granted under the 2013 Plan prior to the effectiveness of the 2023 Plan will remain outstanding under such plan and will continue to vest and/or become exercisable in accordance with their original terms and conditions. As of June 30, 2023, there were 19,167,088 stock options and 862,356 RSUs outstanding under the 2013 Plan.

In April 2023, Precigen adopted the 2023 Plan, which became effective upon shareholder approval in June 2023. The 2023 Plan permits the grant of share-based awards, including stock options, restricted stock awards, and RSUs and other awards, to officers, employees and nonemployees. The 2023 Plan authorizes for issuance pursuant to awards under the 2023 Plan an aggregate of 16,418,137 shares (which is comprised of 12,500,000 shares, plus 3,918,137 shares remaining available for issuance under the 2013 Plan as of the adoption of the 2023 Plan). As of June 30, 2023, no awards were granted under the plan.

In April 2019, Precigen adopted the 2019 Incentive Plan for Non-Employee Service Providers (the "2019 Plan"), which became effective upon shareholder approval in June 2019. The 2019 Plan permits the grant of share-based awards, including stock options, restricted stock awards, and RSUs, to non-employee service providers, including board members. As of June 30, 2023, there were 12,000,000 shares authorized for issuance under the 2019 Plan, of which 3,158,007 stock options and 1,014,952 RSUs were outstanding and 4,502,466 shares were available for grant.

Stock option activity was as follows:

	Number of Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Term (Years)
Balances at December 31, 2022	15,201,276	$ 10.41	6.87
Granted	7,507,869	1.19	
Exercised	—	—	
Forfeited	(220,625)	2.74	
Expired	(163,425)	17.74	
Balances at June 30, 2023	22,325,095	7.33	7.54
Exercisable at June 30, 2023	11,759,874	11.22	6.14

RSU activity was as follows:

	Number of Restricted Stock Units	Weighted Average Grant Date Fair Value	Weighted Average Remaining Contractual Term (Years)
Balances at December 31, 2022	697,815	$ 2.66	0.13
Granted	4,083,777	1.01	
Vested	(2,904,284)	1.37	
Forfeited	—	—	
Balances at June 30, 2023	1,877,308	1.07	0.43

Precigen currently uses authorized and unissued shares to satisfy share award exercises.

13. Operating Leases

The Company leases certain facilities and equipment under operating leases. Leases with a lease term of twelve months or less are considered short-term leases and are not recorded on the balance sheet, and expense for these leases is recognized over the term of the lease. All other leases have remaining terms of one to seven years, some of which may include options to extend the lease and some of which may include options to terminate the lease within one year. The Company uses judgment to determine whether it is reasonably possible to extend the lease beyond the initial term or terminate before the initial term ends and the length of the possible extension or early termination. The leases are renewable at the option of the Company and do not contain residual value guarantees, covenants, or other restrictions.

The components of lease costs were as follows:

	Three Months Ended June 30,		Six Months Ended June 30,	
	2023	2022	2023	2022
Operating lease costs	$ 617	$ 613	$ 1,232	$ 1,240
Short-term lease costs	10	49	30	102
Variable lease costs	86	121	206	224
Lease costs	$ 713	$ 783	$ 1,468	$ 1,566

As of June 30, 2023, maturities of lease liabilities, excluding short-term and variable leases, for continuing operations were as follows:

2023	$ 1,222
2024	2,029
2025	1,903
2026	1,503
2027	1,238
2028	1,260
Thereafter	1,847
Total	11,002
Present value adjustment	(3,036)
Total	$ 7,966
Current portion of operating lease liabilities	$ 1,421
Long-term portion of operating lease liabilities	6,545
Total	$ 7,966

Other information related to operating leases in continuing operations was as follows:

	June 30, 2023	December 31, 2022
Weighted average remaining lease term (years)	5.61	6.09
Weighted average discount rate	11.08 %	11.05 %

	Six Months Ended June 30,	
	2023	2022
Supplemental disclosure of cash flow information		
Cash paid for operating lease liabilities	$ 1,022	$ 1,264
Operating lease right-of-use assets obtained in exchange for new lease liabilities (includes new leases or modifications of existing leases)	373	65

14. Commitments and Contingencies

Contingencies

In October 2020, several shareholder class action lawsuits were filed in the United States District Court for the Northern District of California on behalf of certain purchasers of the Company's common stock. The complaints name as defendants the Company and certain of its current and former officers. The plaintiffs' claims challenged disclosures about the MBP program from May 10, 2017 to March 1, 2019. In March 2021, the Court granted an order consolidating the claims and, in April 2021, appointed a lead plaintiff and lead counsel in the case, captioned In *re Precigen Securities Litigation,* Case No. 5:20-cv-06936-BLF (N.D. Cal.). On May 18, 2021, the lead plaintiff filed an Amended Class Action Complaint. On August 2, 2021, the defendants moved to dismiss the Amended Class Action Complaint. On September 27, 2021, the lead plaintiff filed a Second Amended Class Action Complaint in lieu of a response to the defendants' motion to dismiss. On November 3, 2021, the defendants moved to dismiss the Second Amended Class Action Complaint and on May 31, 2022, the Court granted the defendants' motion to dismiss the Second Amended Class Action Complaint with leave to amend. On August 1, 2022, the lead plaintiff filed a Third Amended Class Action Complaint.

On August 2, 2022, the Court granted the parties' request to conduct a private mediation session to explore potential resolution of the action. On November 17, 2022, at the conclusion of the mediation session, the parties executed a memorandum of understanding that agreed in principle to resolve the claims asserted in the securities class action. The settlement provides for a payment to the plaintiff class of $13,000. On July 7, 2023, the Court granted preliminary approval of the settlement and scheduled a final approval hearing for October 2023. Should the Court not approve the proposed settlement or if the proposed settlement otherwise does not become final, the parties will be returned to their litigation postures prior to the agreement in

principle to settle. In the event that the litigation resumes, the defendants intend to move to dismiss the plaintiff's Third Amended Class Action Complaint. As of both June 30, 2023 and December 31,2022, the Company recorded an accrual of $13,000 in Settlement and Indemnification accruals on the condensed consolidated balance sheets for this matter. In addition, the Company separately recognized an insurance receivable asset of $12,545 and $12,411 within Receivables, other, on the condensed consolidated balance sheets as of June 30, 2023 and December 31,2022, respectively.

In December 2020, a derivative shareholder action, captioned *Edward D. Wright, derivatively on behalf of Precigen, Inc. F/K/A Intrexon Corp. v. Alvarez et al*, was filed in the Circuit Court for Fairfax County in Virginia on behalf of Precigen, Inc. asserting similar claims under state law against Precigen's current directors and certain officers. The plaintiff seeks damages, forfeiture of benefits received by defendants, and an award of reasonable attorneys' fees and costs. The case was stayed by an order entered on June 14, 2021. On September 24, 2021, an individual shareholder filed a lawsuit in the Circuit Court for Henrico County styled *Kent v. Precigen*, Inc., Case CL21-6349. The *Kent* action demands inspection of certain books and records of the Company pursuant to Virginia statutory and common law. On April 1, 2022, the Court denied the demurrer and referred the matter to a hearing on the merits. The Company intends to defend the lawsuits vigorously; however, there can be no assurances regarding the ultimate outcome of these lawsuits.

In the course of its business, the Company is involved in litigation or legal matters, including governmental investigations. Such matters are subject to many uncertainties and outcomes are not predictable with assurance. The Company accrues liabilities for such matters when it is probable that future expenditures will be made and such expenditures can be reasonably estimated. As of June 30, 2023, the Company does not believe that any such matters, individually or in the aggregate, will have a material adverse effect on the Company's business, financial condition, results of operations, or cash flows.

15. Segments

The Company's CODM assesses the operating performance of and allocates resources for several operating segments using Segment Adjusted EBITDA as a basis. Management believes this financial metric is a key indicator of operating results since it excludes noncash revenues and expenses that are not reflective of the underlying business performance of an individual enterprise. The Company defines Segment Adjusted EBITDA as net income (loss) before (i) interest expense, (ii) income tax expense or benefit, (iii) depreciation and amortization, (iv) stock-based compensation expense, (v) loss on settlement agreements where noncash consideration is paid, (vi) adjustments for accrued bonuses paid in equity awards, (vii) gain or loss on disposals of assets, (viii) loss on impairment of goodwill and other noncurrent assets, (ix) equity in net loss of affiliates, and (x) recognition of previously deferred revenue associated with upfront and milestone payments as well as cash outflows from capital expenditures and investments in affiliates, but includes proceeds from the sale of assets in the period sold.

Because the Company uses Segment Adjusted EBITDA as its primary measure of segment performance, it has included this measure in its discussion of segment operating results. The Company has also disclosed revenues from external customers and intersegment revenues for each reportable segment. The CODM does not use total assets by segment to evaluate segment performance or allocate resources, and accordingly, these amounts are not required to be disclosed. The Company's segment presentation excludes amounts related to the operations of Trans Ova which are reported as discontinued operations (Note 3).

For the three and six months ended June 30, 2023, the Company's reportable segments were (i) Biopharmaceuticals and (ii) Exemplar. These identified reportable segments met the quantitative thresholds to be reported separately for the six months ended June 30, 2023. See Note 2 for a description of Biopharmaceuticals. See Note 1 for a description of Exemplar.

Segment Adjusted EBITDA by reportable segment was as follows:

	Three Months Ended June 30,		Six Months Ended June 30,	
	2023	2022	2023	2022
Biopharmaceuticals	$ (17,880)	$ (19,997)	$ (39,277)	$ (40,874)
Exemplar	(83)	795	38	4,353
Segment Adjusted EBITDA for reportable segments	$ (17,963)	$ (19,202)	$ (39,239)	$ (36,521)

The table below reconciles Segment Adjusted EBITDA for reportable segments to consolidated net loss from continuing operations before income taxes:

	Three Months Ended June 30,		Six Months Ended June 30,	
	2023	2022	2023	2022
Segment Adjusted EBITDA for reportable segments	$ (17,963)	$ (19,202)	$ (39,239)	$ (36,521)
All Other Segment Adjusted EBITDA	—	—	—	—
Remove cash paid for capital expenditures, net of proceeds from sale of assets, and cash paid for investments in affiliates	101	172	255	668
Interest Income	828	37	1,461	75
Other expenses:				
Interest expense	(136)	(2,063)	(460)	(4,101)
Depreciation and amortization	(1,693)	(1,835)	(3,404)	(3,753)
Gain (loss) on disposals of assets	40	—	40	—
Impairment losses	—	(638)	—	(1,120)
Stock-based compensation expense	(2,188)	(2,279)	(5,320)	(5,803)
Adjustment related to accrued bonuses paid in equity awards	—	—	3,361	1,698
Equity in net loss of affiliates	—	—	—	(1)
Other	—	(105)	—	(105)
Shares issue for payment of services	—	—	(545)	(576)
Corporate noncash items	627	(203)	678	(468)
Eliminations	—	(32)	—	(97)
Consolidated net loss from continuing operations before income taxes	$ (20,384)	$ (26,148)	$ (43,173)	$ (50,104)

Revenues by reportable segment were as follows:

	Three Months Ended June 30, 2023		
	Biopharmaceuticals	Exemplar	Total
Revenues from external customers	$ —	$ 1,767	$ 1,767
Intersegment revenues	—	—	—
Total segment revenues	$ —	$ 1,767	$ 1,767

	Three Months Ended June 30, 2022		
	Biopharmaceuticals	Exemplar	Total
Revenues from external customers	$ 70	$ 2,841	$ 2,911
Intersegment revenues	—	—	—
Total segment revenues	$ 70	$ 2,841	$ 2,911

	Six Months Ended June 30, 2023		
	Biopharmaceuticals	Exemplar	Total
Revenues from external customers	$ —	$ 3,618	$ 3,618
Intersegment revenues	—	—	—
Total segment revenues	$ —	$ 3,618	$ 3,618

	Six Months Ended June 30, 2022		
	Biopharmaceuticals	Exemplar	Total
Revenues from external customers	$ 154	$ 8,270	$ 8,424
Intersegment revenues	—	—	—
Total segment revenues	$ 154	$ 8,270	$ 8,424

The table below reconciles total segment revenues from reportable segments to total consolidated revenues:

	Three Months Ended June 30,		Six Months Ended June 30,	
	2023	2022	2023	2022
Total segment revenues from reportable segments	$ 1,767	$ 2,911	$ 3,618	$ 8,424
Elimination of intersegment revenues	—	—	—	—
Total consolidated revenues	$ 1,767	$ 2,911	$ 3,618	$ 8,424

For the three months ended June 30, 2023 and 2022, 73.3% and 64.9%, respectively, of total consolidated revenue was attributable to four customers in 2023 and two customers in 2022, in the Exemplar segment. For the six months ended June 30, 2023 and 2022, 78.0% and 67.9%, respectively, of total consolidated revenue was attributable to 4 customers in 2023 and 1 in 2022, in the Exemplar segment.

As of June 30, 2023 and December 31, 2022, the Company had $2,216 and $2,591, respectively, of long-lived assets in foreign countries. The Company recognized revenues derived in foreign countries totaling $0 and $70 for the three months ended June 30, 2023 and 2022, respectively, and $0 and $154 for the six months ended June 30, 2023 and 2022, respectively.

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

The following "Management's Discussion and Analysis of Financial Condition and Results of Operations" should be read in conjunction with the unaudited financial information and the notes thereto included in this Quarterly Report on Form 10-Q, or Quarterly Report, and our Annual Report on Form 10-K for the year ended December 31, 2022, or Annual Report.

The following discussion contains forward-looking statements that reflect our plans, estimates, expectations, and beliefs. Our actual results could differ materially from those discussed in the forward-looking statements and you are cautioned not to place undue reliance on forward-looking statements. Factors that could cause or contribute to these differences include those discussed below and elsewhere in this Quarterly Report, particularly in "Special Note Regarding Forward-Looking Statements" and "Risk Factors." The forward-looking statements included in this Quarterly Report are made only as of the date hereof.

Overview

We are a dedicated discovery and clinical-stage biopharmaceutical company advancing the next generation of gene and cell therapies with the overall goal of improving outcomes for patients with significant unmet medical needs. We are leveraging our proprietary technology platforms to develop product candidates designed to target urgent and intractable diseases in our core therapeutic areas of immuno-oncology, autoimmune disorders, and infectious diseases. We have developed an extensive pipeline of therapies across multiple indications within these core focus areas.

We believe that our array of technology platforms uniquely positions us among other biotechnology companies to advance precision medicine. Precision medicine is the practice of therapeutic product development that takes into account specific genetic variations within populations impacted by a disease to design targeted therapies to improve outcomes for a disease or patient population. Our proprietary and complementary technology platforms provide a strong foundation to realize the core promise of precision medicine by supporting our efforts to construct powerful gene programs to drive efficacy, deliver these programs through viral, non-viral, and microbe-based approaches to maintain lower costs, and control gene expression to ensure safety. Our therapeutic platforms, including UltraCAR-T, AdenoVerse immunotherapy, and ActoBiotics, are designed to allow us to precisely control the level and physiological location of gene expression and modify biological molecules in order to control the function and output of living cells to treat underlying disease conditions.

We are advancing our lead clinical programs, including: PRGN-3005, PRGN-3006 and PRGN-3007, which are built on our UltraCAR-T platform; and PRGN-2009 and PRGN-2012, which are based on our AdenoVerse immunotherapy platform. In addition, we have completed a Phase 1b/2a study of AG019, which is built on our ActoBiotics platform. We also have a robust pipeline of preclinical programs that we are pursuing in order to drive long-term value creation.

We have developed a proprietary electroporation device, UltraPorator, designed to further streamline the rapid and cost-effective manufacturing of UltraCAR-T therapies. UltraPorator has received U.S. Food and Drug Administration, or FDA, clearance for manufacturing UltraCAR-T cells in clinical trials, and we have been dosing patients with UltraCAR-T cells manufactured with UltraPorator in our UltraCAR-T clinical trials.

We exercise discipline in our portfolio management by systematically evaluating data from our preclinical programs in order to make rapid "go" and "no go" decisions. Through this process, we believe we can more effectively allocate resources to programs that we believe show the most promise and advance such programs to clinical trials.

Our Biopharmaceuticals reportable segment is primarily comprised of the Company's legal entities of Precigen and ActoBio, as well as royalty interests in therapeutics and therapeutic platforms from companies not controlled by us. Our Exemplar reportable segment is comprised of Exemplar Genetics LLC, doing business as Precigen Exemplar, or Exemplar, our wholly owned subsidiary focused on developing research models and services for healthcare research applications.

Biopharmaceuticals

Precigen

We are developing therapies built on our UltraCAR-T therapeutics platform and our "off-the-shelf" AdenoVerse immunotherapy platform. Through our UltraCAR-T therapeutics platform, we are able to precision-engineer UltraCAR-T cells to produce a homogeneous cell product that simultaneously expresses antigen-specific chimeric antigen receptor, or CAR, kill switch, and our proprietary membrane-bound interleukin-15, or mbIL15, genes in any genetically modified UltraCAR-T cell. Our decentralized and rapid proprietary manufacturing process allows us to manufacture UltraCAR-T cells overnight at a medical center's current good manufacturing practices facility, or cGMP, and reinfuse the patient the following day after gene transfer. This process improves upon current approaches to CAR-T manufacturing, which require extensive *ex vivo* expansion following viral vector transduction to achieve clinically relevant cell numbers that we believe can result in the exhaustion of

CAR-T cells prior to their administration, limiting their potential for persistence in patients. We have developed a proprietary electroporation device, UltraPorator, designed to further streamline and ensure the rapid and cost-effective manufacturing of UltraCAR-T therapies. The UltraPorator system includes proprietary hardware and software solutions and potentially represents major advancements over current electroporation devices by significantly reducing the processing time and contamination risk. UltraPorator is intended to be a viable scale-up and commercialization solution for decentralized UltraCAR-T manufacturing. Our AdenoVerse immunotherapy platform utilizes a library of proprietary adenovectors for the efficient gene delivery of therapeutic effectors, immunomodulators, and vaccine antigens. We have established proprietary manufacturing cell lines and production methodologies from our AdenoVerse immunotherapy platform, which we believe are easily scalable for commercial supply. We believe that our proprietary gorilla adenovectors, part of the AdenoVerse technology, have superior performance characteristics as compared to current competition, including standard human adenovirus serotype 5, rare human adenovirus types and other non-human primate adenovirus types.

Our most advanced programs are as follows:

PRGN-2012 is a first-in-class, investigational "off-the-shelf" AdenoVerse immunotherapy for the treatment of recurrent respiratory papillomatosis, or RRP. PRGN-2012 is an innovative therapeutic vaccine with optimized antigen design that uses our gorilla adenovector technology, part of our proprietary AdenoVerse platform, to elicit immune responses directed against cells infected with HPV type 6 and HPV type 11. PRGN-2012 is in a Phase 1/2 clinical trial for adult patients with RRP. This clinical trial is being conducted in collaboration with the Center for Cancer Research at the NCI pursuant to a CRADA. We have completed the Phase 1 clinical trial. The Phase 2 clinical trial is ongoing. PRGN-2012 has been granted Breakthrough Therapy Designation for the treatment of RRP by the FDA. Previously, PRGN-2012 was granted Orphan Drug designation by the FDA.

PRGN-2009 is a first-in-class, "off-the-shelf" investigational immunotherapy designed to activate the immune system to recognize and target human papillomavirus-positive, or HPV+, solid tumors. PRGN-2009 leverages our UltraVector and AdenoVerse platforms to optimize HPV type 16 and HPV type 18, antigen designed for delivery via a proprietary gorilla adenovector with a large genetic payload capacity and the ability for repeat administrations. We have completed a Phase 1 clinical trial of PRGN-2009 as a monotherapy or in combination with bintrafusp alfa, or M7824, an investigational bifunctional fusion protein, for patients with HPV-associated cancers in collaboration with the National Cancer Institute, or NCI, pursuant to a cooperative research and development arrangement, or CRADA. A Phase 2 clinical trial of PRGN-2009 in newly diagnosed oropharyngeal squamous cell carcinoma patients is ongoing in collaboration with the NCI pursuant to a CRADA. In addition, we have received FDA clearance of an IND to initiate a Phase 2 clinical trial of PRGN-2009 in combination with pembrolizumab to treat patients with recurrent or metastatic cervical cancer.

PRGN-3006 is a first-in-class, investigational autologous CAR-T therapy that utilizes our UltraCAR-T platform to express a CAR to target CD33 (Siglec-3), mbIL15 and a kill switch gene. PRGN-3006 is currently being evaluated in a Phase 1/1b clinical trial for the treatment of relapsed or refractory, or r/r, acute myeloid leukemia, or AML, and high-risk myelodysplastic syndromes, or MDS. PRGN-3006 has been granted Fast Track designation in patients with r/r AML by the FDA. Previously PRGN-3006 was granted Orphan Drug Designation in patients with AML by the FDA. We have completed the Phase 1 dose escalation trial. The Phase 1b dose expansion trial is ongoing where PRGN-3006 is being evaluated following lymphodepletion.

PRGN-3005 is a first-in-class, investigational autologous CAR-T therapy that utilizes our UltraCAR-T platform to simultaneously express a CAR targeting the unshed portion of the Mucin 16 antigen, mbIL15, and kill switch genes. PRGN-3005 is currently being evaluated in a Phase 1/1b clinical trial for the treatment of advanced, recurrent platinum-resistant ovarian , fallopian tube, or primary peritoneal cancer. We have completed enrollment in the Phase 1 dose escalation cohorts of the intraperitoneal (IP) and intravenous (IV) arms without lymphodepletion as well as in the lymphodepletion cohort in the IV arm and initiated Phase 1b expansion clinical trial.

PRGN-3007 is a first-in-class, investigational autologous CAR-T therapy that utilizes the next generation UltraCAR-T platform to express a CAR which targets ROR1, mbIL15, a kill switch, and a novel mechanism for the intrinsic blockade of the programmed death 1, or PD-1, gene expression. PRGN-3007 is being evaluated in a Phase 1/1b clinical trial for patients with advanced receptor tyrosine kinase-like orphan receptor 1-positive, or ROR1^{+}, hematological (Arm 1) and solid tumors (Arm 2). The target patient population for Arm 1 includes relapsed or refractory CLL, relapsed or refractory MCL, relapsed or refractory B-ALL, and relapsed or refractory DLBCL. The target patient population for Arm 2 includes locally advanced unresectable or metastatic histologically confirmed TNBC Arm 1 and Arm 2 will enroll in parallel. The study is designed to enroll in two parts: an initial 3+3 dose escalation in each arm followed by a dose expansion at the maximum tolerated dose. The Phase 1 dose escalation trial is ongoing.

In addition to our clinical programs, we have a robust pipeline of preclinical programs in order to drive long-term value creation. Our pipeline includes product candidates based on UltraCAR-T and "off-the-shelf" AdenoVerse immunotherapy therapeutic platforms. We expect to continue development of a number of potential product candidates in our preclinical pipeline to identify product candidates for evaluation in clinical trials.

Precigen ActoBio, Inc.

ActoBio is pioneering a proprietary class of microbe-based biopharmaceuticals, referred to as ActoBiotics, that enable expression and local delivery of disease-modifying therapeutics. Our ActoBiotics platform is a unique delivery platform precisely tailored for specific disease modification with the potential for superior efficacy and safety. ActoBiotics combine the advantages of highly selective protein-based therapeutic agents with local delivery by the well-characterized, food-grade bacterium *Lactococcus lactis*, or *L. lactis*. ActoBiotics can be delivered orally in a capsule, through an oral rinse, or in a topical solution. We believe ActoBiotics have the potential to provide superior safety and efficacy through the sustained release of appropriate quantities of select therapeutic agents as compared to injectable biologics, while reducing the side effects commonly attributed to systemic delivery and corresponding peaks in concentration. ActoBiotics work via genetically modified bacteria which deliver proteins and peptides at mucosal sites, rather than the insertion of one or more genes into a human cell by means of a virus or other delivery mechanism. By foregoing this insertion, ActoBiotics enable "gene therapy" without the need for cell transformation.

ActoBio's most advanced internal pipeline candidate, AG019, is a first-in-class disease modifying antigen-specific, investigational immunotherapy for the prevention, delay, or reversal of type 1 diabetes mellitus, or T1D. AG019 is an easy-to-take capsule formulation of ActoBiotics engineered to deliver autoantigen human proinsulin, or hPINS, and the tolerance-enhancing cytokine human interleukin-10 to the mucosal lining of gastro-intestinal tissues in patients with T1D. We have completed a Phase 1b/2a clinical trial of AG019 for the treatment of early-onset T1D. The Phase 1b portion of the study evaluated the safety and tolerability of AG019 monotherapy administered both as a single dose and as repeated daily doses in adult and adolescent patients. The Phase 2a double-blind portion of the study investigated the safety and tolerability of AG019 in combination with teplizumab, or PRV-031. The primary endpoint of assessing safety and tolerability in both the Phase 1b AG019 monotherapy and the Phase 2a AG019 combination therapy has been met. AG019 was well-tolerated when administered to adults and adolescents either as monotherapy or in combination with teplizumab. A single 8-week treatment cycle of oral AG019 as a monotherapy and in combination with teplizumab showed stabilization or increase of C-peptide levels during the first 6 months post treatment initiation in recent-onset T1D.

Third Party Licenses

We previously entered into a collaboration with Castle Creek Biosciences, Inc., or Castle Creek, to advance certain product candidates. Pursuant to the collaboration, we licensed our technology platforms to Castle Creek for use in certain specified fields, and in exchange, we received and were entitled to certain access fees, milestone payments, royalties, and sublicensing fees related to the development and commercialization of product candidates. In March 2020, we and Castle Creek terminated the original collaboration agreement by mutual agreement, with the parties agreeing that certain product candidates would be treated as "Retained Products" under the terms of the original agreement. Castle Creek retains a license to continue to develop and commercialize the Retained Products within the field of use for so long as Castle Creek continues to pursue such development and commercialization; we are also entitled to certain royalties with respect to the Retained Products. One such Retained Product is D-Fi (debcoemagene autoficel), formerly designated FCX-007, for the treatment of recessive dystrophic epidermolysis bullosa, or RDEB.

Precigen Exemplar

Exemplar is committed to enabling the study of life-threatening human diseases through the development of MiniSwine Yucatan miniature pig research models and services, and by enabling the production of cells and organs in its genetically engineered swine for regenerative medicine applications. Historically, researchers have lacked animal models that faithfully represent human diseases. As a result, a sizeable barrier has blocked progress in the discovery of human disease mechanisms; novel diagnostics, procedures, devices, prevention strategies and therapeutics; as well as the ability to predict in humans the efficacy of next-generation procedures, devices, and therapeutics. Exemplar's MiniSwine models are genetically engineered to exhibit a wide variety of human disease states, which provides a more accurate platform to test the efficacy of new medications and devices.

Discontinued Operations

In August 2022, Precigen completed the sale of 100% of the issued and outstanding membership interests in its wholly-owned subsidiary, Trans Ova Genetics, L.C. (“Trans Ova”), a provider of reproductive technologies, including services and products sold to cattle breeders and other producers.

See also "Notes to the Condensed Consolidated Financial Statements (Unaudited) - Note 3" appearing elsewhere in this Quarterly Report for additional discussion of our discontinued operations.

Segments

As of June 30, 2023, our reportable segments were (i) Biopharmaceuticals and (ii) Exemplar. These identified reportable segments met the quantitative thresholds to be reported separately for the six months ended June 30, 2023.

Prior to January 1, 2023, corporate expenses, were not allocated to the segments and were managed at a consolidated level. Corporate expenses, include costs associated with general and administrative functions, including the Company's finance, accounting, legal, human resources, information technology, corporate communication, and investor relations functions. Corporate expenses exclude interest expense, depreciation and amortization, gain or loss on disposals of assets, stock-based compensation expense, loss on settlement agreement, and equity in net loss of affiliates and include unrealized and realized gains and losses on the Company's securities portfolio as well as dividend income. Beginning in the first quarter of 2023, we began allocating certain corporate expenses to one of the reporting units within the Biopharmaceuticals reportable segment. As presented in Note 15 to the Condensed Consolidated Financial Statements (Unaudited) appearing elsewhere in this Quarterly Report, the prior year period has been reclassified to conform to the current period’s presentation.

Financial overview

We have incurred significant losses since our inception. We anticipate that we may continue to incur significant losses for the foreseeable future, and we may never achieve or maintain profitability. Our historical collaboration and licensing revenues were generated under a business model from which we have gradually transitioned, and we do not expect to expend significant resources servicing our historical collaborations in the future. We may enter into strategic transactions for individual platforms or programs in the future from which we may generate new collaboration and licensing revenues. We continue to generate product and service revenues through our Exemplar subsidiary, and in the six months ended June 30, 2023, it produced positive Segment Adjusted EBITDA. Products currently in our clinical pipeline will require regulatory approval and/or commercial scale-up before they may commence significant product sales and operating profits.

As we continue our efforts to focus our business and generate additional capital, we may be willing to enter into transactions involving one or more of our operating segments and reporting units for which we have goodwill and intangible assets. These efforts could result in us identifying impairment indicators or recording impairment charges in future periods. In addition, market changes and changes in judgements, assumptions, and estimates that we have made in assessing the fair value of goodwill could cause us to consider some portion or all of certain assets to become impaired.

Sources of revenue

Although we have generated revenue in the past from collaboration agreements, our primary current revenues arise from Exemplar, which generates product and service revenues through the development and sale of genetically engineered miniature swine models. We recognize revenue when control of the promised product or service is transferred to the customer.

As we have shifted our focus to our healthcare business, we have and may continue to mutually terminate historical collaboration agreements or repurchase rights to the exclusive fields from collaborators, relieving us of any further performance obligations under the agreement. Upon such circumstances or when we determine no further performance obligations are required of us under an agreement, we may recognize any remaining deferred revenue as either collaboration revenue or as a reduction of operating expense, depending on the circumstances. See "Notes to the Consolidated Financial Statements (Unaudited) - Note 4" appearing elsewhere in this Quarterly Report for a discussion of changes to our significant collaborations.

In future periods, in connection with our focus on healthcare, our revenues will primarily depend on our ability to advance and create our own programs and the extent to which we bring products enabled by our technologies to market. Other than for collaboration revenues recognized upon cancellation or modification of an existing collaboration or for revenues generated pursuant to future strategic transactions for any of our existing platforms or programs, we expect our collaboration revenues will continue to decrease in the near term, although if any new collaboration agreements or strategic transactions are entered into, revenue could be positively impacted . Our revenues will also depend upon our ability to maintain or improve the volume and pricing of Exemplar's current product and service offerings and to develop and scale up production of new offerings from the various technologies of Exemplar. As we focus on our healthcare business, we anticipate that our expenses will increase substantially if, and as, we continue to advance the preclinical and clinical development of our existing product candidates and our research programs. We expect a significant period of time could pass before commercialization of our various product candidates or before the achievement of contractual milestones and the realization of royalties on product candidates commercialized under our collaborations. Accordingly, there can be no assurance as to the timing, magnitude, and predictability of revenues, if any, to which we might be entitled.

Cost of products and services

Cost of products and services, all which are related to our Exemplar reporting segment, includes primarily labor and related costs, drugs and supplies, feed used in production, and facility charges, including rent and depreciation. Fluctuations in the price of livestock and feed have not had a significant impact on our operating margins and no derivative financial instruments are used to mitigate the price risk.

Research and development expenses

We recognize research and development expenses as they are incurred. Our research and development expenses consist primarily of:

- salaries and benefits, including stock-based compensation expense, for personnel in research and development functions;
- fees paid to consultants and contract research organizations who perform research on our behalf and under our direction;
- costs related to laboratory supplies used in our research and development efforts and acquiring, developing, and manufacturing preclinical study and clinical trial materials;
- costs related to certain in-licensed technology rights or in-process research and development;
- amortization of patents and related technologies acquired in mergers and acquisitions; and
- facility-related expenses, which include direct depreciation costs and unallocated expenses for rent and maintenance of facilities and other operating costs.

Our research and development expenses are generally incurred by our reportable segments and primarily relate to either costs incurred to expand or otherwise improve our technologies or the costs incurred to develop our own products and services. Our Biopharmaceuticals segment is progressing preclinical and clinical programs that target urgent and intractable diseases in our core therapeutic areas of immuno-oncology, autoimmune disorders, and infectious diseases, including PRGN-3005, PRGN-3006, PRGN-3007, PRGN-2009, and PRGN-2012 and AG019. Our Exemplar segment's research and development activities relate to new and improved pig research models. The following table summarizes our research and development expenses incurred by reportable segment and reconciles those expenses to research and development expenses on the condensed consolidated statements of operations for the three and six months ended June 30, 2023 and 2022.

	Three Months Ended June 30,		Six Months Ended June 30,	
	2023	2022	2023	2022
Biopharmaceuticals	$ 11,797	$ 11,879	$ 23,894	$ 23,597
Exemplar	77	75	143	158
Total consolidated research and development expenses	$ 11,874	$ 11,954	$ 24,037	$ 23,755

The amount of research and development expenses may be impacted by, among other things, the number and nature of our own proprietary programs, and the number and size of programs we may support on behalf of collaboration agreements. We expect that our research and development expenses will increase as we continue to develop our own proprietary programs, including progression of these programs into preclinical and clinical stages. We believe these increases will likely include increased costs paid to consultants and contract research organizations and increased costs related to laboratory supplies.

Research and development expenses may also increase as a result of in-licensing of technologies or ongoing research and development operations that we might assume through mergers and acquisitions.

Selling, general and administrative expenses

Selling, general and administrative, or SG&A, expenses consist primarily of salaries and related costs, including stock-based compensation expense, for employees in executive, operational, finance, information technology, legal, and corporate

communications functions. Other significant SG&A expenses include rent and utilities, insurance, accounting, and legal services (including the cost of settling any claims and lawsuits), and expenses associated with obtaining and maintaining our intellectual property.

SG&A expenses may fluctuate in the future depending on the scaling of our corporate functions required to support our corporate initiatives and the outcomes of legal claims and assessments against us.

Other income (expense), net

Other income consists of interest earned on our cash and cash equivalents and short-term and long-term investments and may fluctuate based on amounts invested and current interest rates.

Other expense consists primarily of interest on our Convertible Notes, which decreased in 2023 due to retirements of our Convertible Notes. See "Notes to the Condensed Consolidated Financial Statements (Unaudited) - Note 9" appearing elsewhere in this Quarterly Report for further discussion.

Equity in net loss of affiliates

Equity in net income or loss of affiliates is our pro-rata share of our equity method investments' operating results, adjusted for accretion of basis difference. We account for investments in our JVs using the equity method of accounting since we have the ability to exercise significant influence, but not control, over the operating activities of these entities.

Segment performance

We use Segment Adjusted EBITDA as our primary measure of segment performance. We define Segment Adjusted EBITDA as net income (loss) before (i) interest expense, (ii) income tax expense or benefit, (iii) depreciation and amortization, (iv) stock-based compensation expense, (v) loss on settlement agreements where noncash consideration is paid, (vi) adjustments for accrued bonuses paid in equity awards, (vii) gain or loss on disposals of assets, (viii) loss on impairment of goodwill and other noncurrent assets, (ix) equity in net loss of affiliates, and (x) recognition of previously deferred revenue associated with upfront and milestone payments as well as cash outflows from capital expenditures and investments in affiliates, but includes proceeds from the sale of assets in the period sold. See "Notes to the Condensed Consolidated Financial Statements (Unaudited) - Note 15" appearing elsewhere in this Quarterly Report for further discussion of Segment Adjusted EBITDA.

Results of operations

Comparison of the three months ended June 30, 2023 and the three months ended June 30, 2022

The following table summarizes our results of operations for the three months ended June 30, 2023 and 2022, together with the changes in those items in dollars and as a percentage:

	Three Months Ended June 30,		Dollar Change	Percent Change
	2023	2022		
	(In thousands)			
Revenues				
Product revenues	$ 324	621	$ (297)	(47.8)%
Service revenues	1,438	2,213	(775)	(35.0)%
Other revenues	5	77	(72)	(93.5)%
Total revenues	1,767	2,911	(1,144)	(39.3)%
Operating expenses				
Cost of product and services	1,697	1,811	(114)	(6.3)%
Research and development	11,874	11,954	(80)	(0.7)%
Selling, general and administrative	9,316	12,670	(3,354)	(26.5)%
Impairment of other noncurrent assets	—	638	(638)	(100.0)%
Total operating expenses	22,887	27,073	(4,186)	(15.5)%
Operating loss	(21,120)	(24,162)	3,042	(12.6)%
Total other income (expense), net	736	(1,986)	2,722	137.1 %
Loss from continuing operations before income taxes	(20,384)	(26,148)	5,764	(22.0)%
Income tax benefit	65	89	(24)	(27.0)%
Loss from continuing operations	(20,319)	(26,059)	5,740	(22.0)%
Income from discontinued operations, net of income taxes (1)	—	8,424	(8,424)	(100.0)%
Net loss	$ (20,319)	$ (17,635)	$ (2,684)	15.2 %

(1) See "Notes to the Condensed Consolidated Financial Statements (Unaudited) - Note 3" appearing elsewhere in this Quarterly Report.

Revenues and gross margin

Revenues decreased $1.1 million, or 39%, from the three months ended June 30, 2022. This decrease related to reductions in services performed at Exemplar. Gross margin on product and services declined in the current period primarily as a result of the decreased revenues, with a smaller impact due to increases in salaries, benefits, and other personnel costs at Exemplar.

Research and development expenses

Research and development expenses decreased $0.1 million, or 1%, compared to the three months ended June 30, 2022. This decrease was primarily driven by less expense incurred related to preclinical research programs for the comparable period.

Selling, general and administrative expenses

SG&A expenses decreased $3.4 million, or 27%, compared to the three months ended June 30, 2022. This decrease was primarily driven by a reduction in professional fees of $2.2 million, due to decreased legal fees associated with certain litigation matters, as well as a $1.1 million reduction in salaries, benefits, and other personnel costs due to reduced head count.

Total other income (expense), net

Total other income, net, increased $2.7 million compared to the three months ended June 30, 2022. This is primarily due to reduced interest expense associated with our Convertible Notes issued July 2018 as they were retired in the second quarter of 2023, and increased interest income due to higher interest rates on our investments.

Segment performance

The following table summarizes Segment Adjusted EBITDA, which is our primary measure of segment performance, for the three months ended June 30, 2023 and 2022, for each of our reportable segments.

	Three Months Ended June 30,		Dollar Change	Percent Change
	2023	2022		
	(In thousands)			
Segment Adjusted EBITDA:				
Biopharmaceuticals	$ (17,880)	$ (19,997)	$ 2,117	10.6 %
Exemplar	(83)	795	(878)	(110.4)%

For a reconciliation of Segment Adjusted EBITDA to net loss from continuing operations before income taxes, see "Notes to the Condensed Consolidated Financial Statements (Unaudited) - Note 15" appearing elsewhere in this Quarterly Report.

The following table summarizes revenues from external customers for the three months ended June 30, 2023 and 2022, for each of our reportable segments.

	Three Months Ended June 30,		Dollar Change	Percent Change
	2023	2022		
	(In thousands)			
Biopharmaceuticals	$ —	$ 70	$ (70)	(100.0)%
Exemplar	1,767	2,841	(1,074)	(37.8)%

Biopharmaceuticals

Segment Adjusted EBITDA increased primarily due to our reduction in Selling, general and administrative expenses within the reportable segment.

Exemplar

Revenues for Exemplar decreased due to a decrease in services performed resulting from a lower demand from existing customers. The decline in Segment Adjusted EBITDA was primarily due to the decreased revenues.

Comparison of the six months ended June 30, 2023 and the six months ended June 30, 2022

The following table summarizes our results of operations for the six months ended June 30, 2023 and 2022, together with the changes in those items in dollars and as a percentage:

	Six Months Ended June 30,		Dollar Change	Percent Change
	2023	2022		
	(In thousands)			
Revenues				
Product revenues	$ 648	1,113	$ (465)	(41.8)%
Service revenues	2,965	7,146	(4,181)	(58.5)%
Other revenues	5	165	(160)	(97.0)%
Total revenues	3,618	8,424	(4,806)	(57.1)%
Operating expenses				
Cost of product and services	3,224	3,505	(281)	(8.0)%
Research and development	24,037	23,755	282	1.2 %
Selling, general and administrative	20,954	26,359	(5,405)	(20.5)%
Impairment of goodwill	—	482	(482)	(100.0)%
Impairment of other noncurrent assets	—	638	(638)	(100.0)%
Total operating expenses	48,215	54,739	(6,524)	(11.9)%
Operating loss	(44,597)	(46,315)	1,718	(3.7)%
Total other income (expense), net	1,424	(3,788)	5,212	137.6 %
Equity in net loss of affiliates	—	(1)	1	(100.0)%
Loss from continuing operations before income taxes	(43,173)	(50,104)	6,931	(13.8)%
Income tax benefit	120	147	(27)	(18.4)%
Loss from continuing operations	(43,053)	(49,957)	6,904	(13.8)%
Income from discontinued operations, net of income taxes (1)	—	13,071	(13,071)	(100.0)%
Net loss	$ (43,053)	$ (36,886)	$ (6,167)	16.7 %

(1) See "Notes to the Condensed Consolidated Financial Statements (Unaudited) - Note 3" appearing elsewhere in this Quarterly Report.

Revenues and gross margin

Revenues decreased $4.8 million, or 57.1%, from the six months ended June 30, 2022. This decrease primarily related to reductions in services performed at Exemplar as well as the recognition of revenue in the first quarter of 2022 related to agreements for which revenue was previously deferred that did not occur in 2023 of $1.0 million at Exemplar. Gross margin on product and service declined in the current period primarily as a result of the decreased revenues, with a smaller impact due to increases in salaries, benefits, and other personnel costs at Exemplar.

Research and development expenses

Research and development expenses increased $0.3 million, or 1.2%, compared to the six months ended June 30, 2022. This increase was primarily driven by a continued prioritization of clinical product candidates.

Selling, general and administrative expenses

SG&A expenses decreased $5.4 million, or 20.5%, compared to the six months ended June 30, 2022. This decrease was primarily driven by a reduction in professional fees of $4.2 million, due to decreased legal fees associated with certain litigation matters, as well as a $1.1 million reduction in salaries, benefits, and other personnel costs due to reduced head count.

Total other income (expense), net

Total other income, net, increased $5.2 million compared to the six months ended June 30, 2022. This is primarily due to reduced interest expense associated with our Convertible Notes issued July 2018 as they were retired in the second quarter of 2023, and increased interest income due to higher interest rates on our investments.

Segment performance

The following table summarizes Segment Adjusted EBITDA, which is our primary measure of segment performance, for the six months ended June 30, 2023 and 2022.

	Six Months Ended June 30,		Dollar Change	Percent Change
	2023	2022		
	(In thousands)			
Segment Adjusted EBITDA:				
Biopharmaceuticals	$ (39,277)	$ (40,874)	$ 1,597	3.9 %
Exemplar	38	4,353	(4,315)	(99.1)%

For a reconciliation of Segment Adjusted EBITDA to net loss from continuing operations before income taxes, see "Notes to the Condensed Consolidated Financial Statements (Unaudited) - Note 15" appearing elsewhere in this Quarterly Report.

The following table summarizes revenues from external customers for the six months ended June 30, 2023 and 2022, for each of our reportable segments.

	Six Months Ended June 30,		Dollar Change	Percent Change
	2023	2022		
	(In thousands)			
Biopharmaceuticals	$ —	$ 154	$ (154)	(100.0)%
Exemplar	3,618	8,270	(4,652)	(56.3)%

Biopharmaceuticals

Segment Adjusted EBITDA increased primarily as a result of a reduction of Selling, general and administrative expenses partially offset by a higher adjustment related to bonuses settled in equity awards in 2023 and other segment EBITDA adjustments.

Exemplar

Revenues for Exemplar decreased due to a decrease in services performed resulting from a lower demand from existing customers. The decline in Segment Adjusted EBITDA was primarily due to the decreased revenues.

Liquidity and capital resources

Sources of liquidity

We have incurred losses from operations since our inception, and as of June 30, 2023, we had an accumulated deficit of $1.9 billion. From our inception through June 30, 2023, we have funded our operations principally with proceeds received from private and public equity and debt offerings, cash received from our collaborators, and through product and service sales made directly to customers. As of June 30, 2023, we had cash and cash equivalents of $16.5 million and short-term and long-term investments of $79.0 million. Cash in excess of immediate requirements is typically invested primarily in money market funds, certificate of deposits and U.S. government debt securities in order to maintain liquidity and preserve capital.

In January 2023, we closed a public offering of 43,962,640 shares of our common stock, resulting in net proceeds to us of $72.8 million, after deducting underwriting discounts, fees, and other offering expenses.

Cash flows

The following table sets forth the significant sources and uses of cash for the periods set forth below:

	Six Months Ended June 30,	
	2023	2022
	(In thousands)	
Net cash provided by (used in):		
Operating activities	$ (34,156)	$ (25,836)
Investing activities	(26,905)	33,141
Financing activities	29,589	(276)
Effect of exchange rate changes on cash, cash equivalents, and restricted cash	(172)	(471)
Net decrease in cash, cash equivalents, and restricted cash	$ (31,644)	$ 6,558

Cash flows from operating activities:

During the six months ended June 30, 2023, our net loss was $43.1 million, which includes the following significant noncash expenses totaling $9.2 million: (i) $5.3 million of stock-based compensation expense, (ii) $3.4 million of depreciation and amortization expense, and (iii) $0.5 million of shares issued as payment for services.

During the six months ended June 30, 2022, our net loss was $36.9 million, which includes the following significant noncash expenses totaling $14.7 million from both continuing and discontinued operations: (i) $5.9 million of stock-based compensation expense, (ii) $6.5 million of depreciation and amortization expense, (iii) $0.6 million accretion of debt discount and amortization of deferred financing costs, (iv) $0.6 million of shares issued as payment for services, and (vi) $1.1 million of asset impairments.

Our cash outflows from operations during the six months ended June 30, 2023 were $8.3 million lower than the six months ended June 30, 2022 primarily due to decreased cash inflows provided by Trans Ova and Exemplar.

Cash flows from investing activities:

During the six months ended June 30, 2023, we purchased $26.7 million of investments, net of sales and maturities, primarily using the proceeds received from the underwritten public offering discussed below under cash flows from financing activities.

During the six months ended June 30, 2022, we received proceeds of $36.0 million related to the sale and maturity of investments, partially offset by $3.3 million of purchases of property plant and equipment primarily in Trans Ova.

Cash flows from financing activities:

During the six months ended June 30, 2023, we received $72.8 million proceeds from the sale of our common stock in an underwritten public offering and retired $43.1 million of our Convertible Notes using restricted cash.

During the six months ended June 30, 2022, we made payments of long-term debt of $0.3 million .

Future capital requirements

We believe our existing liquid assets will enable us to fund our operating expenses and capital requirements for at least the next 12 months. Our future capital requirements will depend on many factors, including:

- progress in our research and development programs, as well as the magnitude of these programs;
- the timing of regulatory approval of our product candidates and those of our collaborations;
- the timing, receipt, and amount of any payments received in connection with strategic transactions;

- the timing, receipt, and amount of upfront, milestone, and other payments, if any, from present and future collaborators, if any;
- the timing, receipt, and amount of sales and royalties, if any, from our product candidates;
- the timing and capital requirements to scale up our various product candidates and service offerings and customer acceptance thereof;
- our ability to maintain and establish additional collaborative arrangements and/or new strategic initiatives;
- the resources, time, and cost required for the preparation, filing, prosecution, maintenance, and enforcement of our intellectual property portfolio;
- strategic mergers and acquisitions, if any, including both the upfront acquisition cost as well as the cost to integrate, maintain, and expand the strategic target;
- the costs associated with legal activities, including litigation, arising in the course of our business activities and our ability to prevail in any such legal disputes; and

Until such time, if ever, as we can regularly generate positive operating cash flows, we plan to finance our cash needs through a combination of equity offerings, debt financings, government, or other third-party funding, strategic alliances, sales of assets, and licensing arrangements. We may not be able to raise sufficient additional funds on terms that are favorable to us, if at all. To the extent that we raise additional capital through the sale of equity or convertible debt securities, the ownership interests of our common shareholders will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect the rights of our common shareholders. Our current stock price may make it more difficult to pursue equity financings and lead to substantial dilution if the price of our common stock does not increase. Debt financing, if available, 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. If we raise additional funds through strategic transactions, collaborations, or licensing arrangements with third parties, we may have to relinquish valuable rights to our technologies, future revenue streams, research programs, or product candidates, or to grant licenses on terms that may not be favorable to us.

We are subject to a number of risks similar to those of other companies conducting high-risk, early-stage research and development of product candidates. Principal among these risks are dependence on key individuals and intellectual property, competition from other products and companies, and the technical risks associated with the successful research, development, and clinical manufacturing of its product candidates. Our success is dependent upon our ability to continue to raise additional capital in order to fund ongoing research and development, adequately satisfy or renegotiate long-term debt obligations, obtain regulatory approval of our products, successfully commercialize our products, generate revenue, meet our obligations, and, ultimately, attain profitable operations.

See the section entitled "Risk Factors" in our Annual Report for additional risks associated with our substantial capital requirements.

Contractual obligations and commitments

The following table summarizes our significant contractual obligations and commitments from continuing operations as of June 30, 2023 and the effects such obligations are expected to have on our liquidity and cash flows in future periods:

	Total	Less Than 1 Year	1 - 3 Years	3 - 5 Years	More Than 5 Years
			(In thousands)		
Operating leases	$ 11,002	$ 2,235	$ 3,803	$ 2,485	$ 2,479
Total	$ 11,002	$ 2,235	$ 3,803	$ 2,485	$ 2,479

(1) See "Notes to the Condensed Consolidated Financial Statements (Unaudited) - Notes 9" appearing elsewhere in this Quarterly Report for further discussion of our convertible debt.

In addition to the obligations in the table above, as of June 30, 2023, we are party to license agreements with various third parties that contain future milestones and royalty payment obligations related to development milestones and/or commercial sales of products that incorporate or use their technologies. Because these agreements are generally subject to termination by us or are dependent on certain condition precedents within our control, no amounts are included in the tables above. As of June 30, 2023, we also had research and development commitments with third parties totaling $19.5 million that had not yet been incurred.

Off-balance sheet arrangements

We did not have during the periods presented, and we do not currently have, any off-balance sheet arrangements as defined under SEC rules.

Critical accounting policies and estimates

Our management's discussion and analysis of our financial condition and results of operations is based on our condensed consolidated financial statements, which we have prepared in accordance with generally accepted accounting principles in the United States. The preparation of these condensed consolidated financial statements requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the financial statements, as well as the reported revenues and expenses during the reporting periods. We evaluate these estimates and judgments on an ongoing basis. We base our estimates on historical experience and on various other factors that we believe are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying value of assets and liabilities that are not readily apparent from other sources. Our actual results may differ from these estimates under different assumptions or conditions.

There have been no material changes to our critical accounting policies from those described in "Management's Discussion and Analysis of Financial Condition and Results of Operations" included in our Annual Report.

Recent accounting pronouncements

For information with respect to recent accounting pronouncements and the impact of these pronouncements on our condensed consolidated financial statements, see "Notes to the Condensed Consolidated Financial Statements (Unaudited) - Note 2" appearing elsewhere in this Quarterly Report.

Item 3. Quantitative and Qualitative Disclosures About Market Risk

The following sections provide quantitative information on our exposure to interest rate risk. We make use of sensitivity analyses that are inherently limited in estimating actual losses in fair value that can occur from changes in market conditions.

Interest rate risk

We had cash, cash equivalents and short-term and long-term investments of $95.6 million and $56.0 million as of June 30, 2023 and December 31, 2022, respectively. Our cash and cash equivalents and short-term and long-term investments consist of cash, money market funds, U.S. government debt and agency securities, and certificates of deposit. The primary objectives of our investment activities are to preserve principal, maintain liquidity, and maximize income without significantly increasing risk. Our investments consist of U.S. government debt and agency securities and certificates of deposit, which may be subject to market risk due to changes in prevailing interest rates that may cause the fair values of our investments to fluctuate. We believe that a hypothetical 100 basis point increase in interest rates would not materially affect the fair value of our interest-sensitive financial instruments and any such losses would only be realized if we sold the investments prior to maturity.

Item 4. Controls and Procedures

Pursuant to Rule 13a-15(b) under the Securities Exchange Act of 1934, as amended (the "Exchange Act"), we carried out an evaluation, under supervision and with the participation of our management, including our Chief Executive Officer ("CEO"), who is our principal executive officer, and our Chief Financial Officer ("CFO"), who is our principal financial officer, of the effectiveness of the design and operation of our disclosure controls and procedures (as defined under Rule 13a-15(e) and 15d-15(e) under the Exchange Act) as of the end of the period covered by this report. Based upon that evaluation, as of the end of the period covered by this report, our CEO and CFO concluded that our disclosure controls and procedures are effective at the reasonable assurance level to ensure that 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, and that such information is accumulated and communicated to our management, including our CEO and CFO, as appropriate, to allow timely decisions regarding required disclosure.

There has been no change in our internal control over financial reporting during the three months ended June 30, 2023, that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

PART II. OTHER INFORMATION

Item 1. Legal Proceedings

In the course of our business, we are involved in litigation or legal matters, including governmental investigations. Such matters are subject to many uncertainties and outcomes are not predictable with assurance. We accrue liabilities for such matters when it is probable that future expenditures will be made and such expenditures can be reasonably estimated. As of June 30, 2023, we do not believe that any such matters, individually or in the aggregate, will have a material adverse effect on our business, financial condition, results of operations, or cash flows.

See "Notes to the Condensed Consolidated Financial Statements (Unaudited) - Note 14" appearing elsewhere in this Quarterly Report for further discussion of ongoing legal matters.

Item 1A. Risk Factors

As disclosed in "Summary of Risk Factors" and "Item 1A. Risk Factors" in our Annual Report, there are a number of risks and uncertainties that may have a material effect on the operating results of our business and our financial condition. There are no additional material updates or changes to our risk factors since the filing of our Annual Report.

In evaluating our risks, readers also should carefully consider the risk factors discussed in our Annual Report, which could materially affect our business, financial condition, or operating results, in addition to the other information set forth in this report and in our other filings with the SEC.

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

None.

Item 3. Defaults on Senior Securities

None.

Item 4. Mine Safety Disclosures

Not applicable.

Item 5. Other Information

None.

Item 6. Exhibits

Exhibit No.	Description
10.1+	Amended and Restated Exclusive License Agreement with Alaunos Therapeutics, dated April 3, 2023.
31.1	Certification of Helen Sabzevari, Chief Executive Officer (Principal Executive Officer) of the Company, pursuant to Rules 13a-14(a) and 15d-14(a) promulgated under the Securities Exchange Act of 1934, as amended, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.2	Certification of Harry Thomasian Jr., Chief Financial Officer (Principal Financial Officer) of the Company, pursuant to Rules 13a-14(a) and 15d-14(a) promulgated under the Securities Exchange Act of 1934, as amended, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
32.1**	Certification of Helen Sabzevari, Chief Executive Officer (Principal Executive Officer) of the Company, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
32.2**	Certification of Harry Thomasian Jr., Chief Financial Officer (Principal Financial Officer) of the Company, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
101**	Interactive Data File (Quarterly Report on Form 10-Q, for the quarterly period ended June 30, 2023, formatted in Inline XBRL (eXtensible Business Reporting Language)). Attached as Exhibit 101.0 to this Quarterly Report on Form 10-Q are the following documents formatted in XBRL: (i) the Condensed Consolidated Balance Sheets as of June 30, 2023 and December 31, 2022, (ii) the Condensed Consolidated Statements of Operations for the three and six months ended June 30, 2023 and 2022, (iii) the Condensed Consolidated Statements of Comprehensive Loss for the three and six months ended June 30, 2023 and 2022, (iv) the Condensed Consolidated Statements of Shareholders' Equity for the three and six months ended June 30, 2023 and 2022, (v) the Condensed Consolidated Statements of Cash Flows for the six months ended June 30, 2023 and 2022, and (vi) the Notes to the Condensed Consolidated Financial Statements.
104**	Cover Page Interactive Data File (embedded within the Inline XBRL document).

** Furnished herewith.

+ Certain confidential portions of this exhibit were omitted by means of marking such portions with brackets [*****] because the identified confidential portions (i) are not material and (ii) is the type of information the Registrant treats as private or confidential, in accordance with Regulation S-K, Item 601(b)(10).

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.

Precigen, Inc.
(Registrant)

Date: August 9, 2023

By: /s/ HARRY THOMASIAN JR.
Harry Thomasian Jr.
Chief Financial Officer
(Principal Financial and Accounting Officer)

Certain identified information has been excluded from the exhibit because it is both (i) not material and (ii) is the type of information that the registrant treats as private or confidential. Omissions are designated as [*****].

AMENDED AND RESTATED EXCLUSIVE LICENSE AGREEMENT

This **AMENDED AND RESTATED EXCLUSIVE LICENSE AGREEMENT** (the "**Agreement**") is entered into as of April 3, 2023 (the "**Effective Date**") replaces in its entirety the Exclusive License Agreement entered into on October 5, 2018 (the "**ELA Agreement**") by and between **Alaunos Therapeutics** (formerly known as ZIOPHARM ONCOLOGY, INC.), a Delaware corporation, with its principal place of business at 8030 El Rio, Houston TX 77054 ("**Alaunos**"), and **PRECIGEN, INC.**, a Virginia corporation, with its principal place of business at 20358 Seneca Meadows Parkway, Germantown, MD 20876 ("**Precigen**"). Alaunos and Precigen are sometimes referred to herein individually as a "**Party**" and collectively as the "**Parties**".

RECITALS

WHEREAS, Precigen possesses certain intellectual property related to Licensed Products (as defined below);

WHEREAS, Alaunos is a biopharmaceutical company focused on development of TCR Products (as defined below);

WHEREAS, Precigen and Alaunos are parties to certain agreements that, by this Agreement, are being terminated and/or amended;

WHEREAS, in consideration of entering into this Agreement, the Parties have agreed to amend certain rights, obligations and payment terms; and

WHEREAS, in connection with the Parties entering into this Agreement, the Parties have agreed to release each other from certain claims that either such Party may have under any prior agreement or arrangement between the Parties.

NOW, THEREFORE, in consideration of the foregoing premises and the mutual promises, covenants and conditions contained in this Agreement, the Parties agree as follows:

ARTICLE 1
DEFINITIONS

1.1 "**2015 MDACC License**" means that certain License Agreement by and among Intrexon Corporation, Alaunos and MDACC with an effective date of January 13, 2015, as amended, and as assigned by Intrexon and assumed by Precigen effective as of January 1, 2018.

1.2 "**2018 MDACC License**" means that certain License Agreement by and among Precigen, Alaunos and MDACC with an effective date of January 8, 2018, as amended.

1.3 "**AAA**" has the meaning set forth in Section 11.2.

1.4 "**AAA Rules**" has the meaning set forth in Section 11.2.

1.5 "**Accessory Material Agents**" means those materials as set forth in a letter agreement dated as of the date hereof by and between the Parties for use in the Field with Licensed Products.

1.6 "**Activator Ligand**" means (i) veledimex and all formulations covered by the Drug Master File for a Formerly Licensed Product developed by Alaunos, and (ii) changes to the subject matter described in the foregoing (i) and made by Alaunos to advance a Formerly Licensed Product ("**Alaunos Veledimex Alterations**").

1.7 "**Affiliate**" means, with respect to a particular Party or other entity, a person, corporation, partnership, or other entity that controls, is controlled by or is under common control with such Party or other entity. For the purposes of this definition, the word "control" (including, with correlative meaning, the terms "controlled by" or "under common control with") means the actual power, either directly or indirectly through one or more intermediaries, to direct or cause the direction of the management and policies of such entity, whether by the ownership of fifty percent (50%) or more of the voting stock of such entity, or by contract or otherwise.

1.8 "**Alaunos**" has the meaning set forth in the preamble.

1.9 "**Bankrupt Party**" has the meaning set forth in Section 12.2(a).

1.10 **"BCMA CAR Products**" means any biological product, process or therapy developed under or arising from the B-cell maturation antigen (BCMA) CAR Program that is comprised of a CAR that is directed to BCMA, including all forms, formulations, presentations, doses, administrations and package configurations.

1.11 "**BCMA CAR Program**" means a program(s) of Research and Development focused on using CAR cells directed to BCMA.

1.12 "**Business Day**" means a day other than Saturday, Sunday or any day that banks in New York, New York, USA are required or permitted to be closed.

1.13 "**CD19 CAR Products**" means any biological product, process or therapy developed under or arising from the CD19 CAR Program that is comprised of a CAR that is directed to CD19, including all forms, formulations, presentations, doses, administrations and package configurations. CD19 CAR Products include all product candidates that previously were under Development by Alaunos (and Precigen and its Affiliates) as of the Effective Date that contain a CAR that targets CD19.

1.14 "**CD19 CAR Program**" means a program(s) of Research and Development focused on using CAR cells directed to CD19.

1.15 "**Chimeric Antigen Receptor**" or "**CAR**" means [*****].

1.16 "**Chimeric Antigen Receptor T-Cell**" or "**CAR-T**" means (i) [*****].

1.17 "**Claims**" has the meaning set forth in Section 8.1.

1.18 "**Commercialization**" means the marketing, promotion, sale and/or distribution of products in the Territory, and all related manufacturing activities not included in the definition of Development. Commercialization, in relation to a Licensed Product, shall include commercial activities conducted in preparation for Licensed Product launch. "**Commercialize**" has a correlative meaning.

1.19 "**Confidential Information**" of a Party means any and all Information of such Party that is disclosed to the other Party under this Agreement, whether in oral, written, graphic, or electronic form. In addition, all Information disclosed by Precigen pursuant to the ELA Agreement and its predecessor agreements shall be deemed to be Precigen's Confidential Information disclosed hereunder, and all Information disclosed by Alaunos pursuant to the ELA Agreement and its predecessor agreements shall be deemed to be Alaunos' Confidential Information disclosed hereunder; provided that any use or disclosure of any Information that is authorized under Section 9.2 or otherwise licensed or expressly contemplated by this Agreement shall not be restricted by, or be deemed a violation of, the surviving confidentiality provisions under the predecessor agreements.

1.20 "**Construct**" means the [*****].

1.21 "**Control**" means, with respect to any material, Information, or intellectual property right, that a Party (a) owns or (b) has a license (other than a license granted to such Party under this Agreement) to such material, Information, or intellectual property right and, in each case, has the ability to grant to the other Party access, a license, or a sublicense (as applicable) to the foregoing on the terms and conditions set forth in this Agreement without violating the terms of any then-existing agreement or other legally enforceable arrangement with any Third Party.

1.22 "**Cover**" means, with respect to a claim of a Patent and a product, that such claim would be infringed, absent a license, by the manufacture, use, offer for sale, sale or importation of such product (considering claims of patent applications to be issued as then pending). "**Covering**" and "**Covered**" shall have a correlative meaning.

1.23 "**Covering Claim**" has the meaning set forth in Section 5.2(b).

1.24 "**Development**" means all activities that relate to the pre-clinical and clinical development of a product or to (a) obtaining, maintaining or expanding Regulatory Approval of a product, or (b) developing the ability to manufacture clinical and commercial quantities of a product. This includes: (i) preclinical testing, toxicology, and clinical trials; (ii) preparation, submission, review, and development of data or information for the purpose of submission to a Governmental Authority to obtain, maintain or expand Regulatory Approval of a product; and (iii) manufacturing process development and scale-up, bulk production and fill/finish work associated with the supply of a product for preclinical testing and clinical trials, and related quality assurance and technical support activities. "**Develop**" and "**Developed**" have a correlative meaning.

1.25 "**Dispute**" has the meaning set forth in Section 11.1.

1.26 "**Dollar**" means a U.S. dollar, and "**$**" shall be interpreted accordingly.

1.27 "**Exclusive Products**" means TCR Exclusive Products. For clarity, Exclusive Products include all forms, formulations, presentations, doses, administrations and package configurations thereof.

1.28 "**Exclusive Program**" means, as applicable, the TCR Exclusive Program.

1.29 "**Executive Officer**" means, with respect to Precigen, its President or CEO, and with respect to Alaunos, its CEO.

1.30 "**FD&C Act**" means the U.S. Federal Food, Drug and Cosmetic Act, as amended.

1.31 "**FDA**" means the U.S. Food and Drug Administration or any successor entity.

1.32 "**Field**" means (a) use of a Licensed Product (including TCR Products), for Treatment of cancer in humans, including solid and hematological cancers, and (b) use of TCR Products in the HPV Field. Except to the extent permitted under clause (b), the Field shall not include the prophylaxis or amelioration of conditions or symptoms associated with cancer or infectious disease which may result in cancer.

1.33 "**Formerly Licensed Product**" means, as described in the ELA Agreement (i) IL-12 Products or an IL-12 Program, (ii) CD19 CAR Products or a CD19 CAR Program, or (iii) a BCMA CAR Product or a BCMA CAR Program.

1.34 "**Gamma Delta T Cells**" means T-Cells expressing gamma delta TCRs.

1.35 "**Gorilla IL-12 Products**" means any biological product, process or therapy Developed under the Gorilla IL-12 Program that is comprised of the Gorilla IL-12 Construct, including all forms, formulations, presentations, doses, administrations and package configurations.

1.36 "**Gorilla IL-12 Program**" means a program(s) of Research and Development dependent on use of the Gorilla IL-12 Construct.

1.37 "**Governmental Authority**" means any multi-national, federal, state, local, municipal, provincial or other governmental authority of any nature (including any governmental division, prefecture, subdivision, department, agency, bureau, branch, office, commission, council, court or other tribunal).

1.38 "**HPV Field**" means, the treatment and prevention of human papillomavirus (HPV) infection and/or *in vivo* replication or proliferation solely to the extent the primary reason for such treatment or prevention is to prevent cancer**.**

1.39 "**Human IL-12 Products**" means any biological product, process or therapy Developed under the Human IL-12 Program, including all forms, formulations, presentations, doses, administrations and package configurations.

1.40 "**Human IL-12 Program**" means a program(s) of Research and Development focused on the use of the human clinical adenovirus to express Constructs.

1.41 "**IL-12 Products**" means the Human IL-12 Products and the Gorilla IL-12 Products.

1.42 "**IL-12 Program**" means, as applicable, the Human IL-12 Program or the Gorilla IL-12 Program.

1.43 "**IND**" means (a) an Investigational New Drug Application as defined in the FD&C Act and applicable regulations promulgated thereunder by the FDA, or (b) the equivalent application to the equivalent agency in any other regulatory jurisdiction, the filing of which is necessary to initiate or conduct clinical testing of a pharmaceutical product in humans in such jurisdiction.

1.44 "**Indemnified Party**" has the meaning set forth in Section 8.3.

1.45 "**Indemnifying Party**" has the meaning set forth in Section 8.3.

1.46 "**Information**" means any data, results, technology, in any tangible or intangible form, including know-how, trade secrets, practices, techniques, methods, processes, inventions, developments, specifications, formulations, formulae, algorithms, technology, test data (including biological and chemical, biochemical, clinical test data and data resulting from non-clinical studies), CMC information, stability data and other study data and procedures.

1.47 "**Laws**" means all laws, statutes, rules, regulations, ordinances and other pronouncements having the effect of law of any federal, national, multinational, state, provincial, county, city or other political subdivision, domestic or foreign.

1.48 "**Licensed Intellectual Property**" means the Licensed Know-How and Licensed Patents and any Alaunos Veledimex Alterations.

1.49 "**Licensed Know-How**" means all Information Controlled by Precigen or its Affiliates as of October 5, 2018 that (a) is reasonably required or useful to advance Licensed Products and (i) was generated by or on behalf of Precigen or its Affiliates and was actually provided to and/or used by or on behalf of Alaunos or its Affiliates in connection with a Program as of, or prior to, October 5, 2018 (as evidenced by such Party's or its Affiliates' contemporaneous records) or (ii) was actually generated by or on behalf of Alaunos or its Affiliates or (b) is reasonably required to manufacture Accessory Material Agents.

1.50 "**Licensed Patent**" means (a) any patent or patent application listed on Exhibit A, together with all continuations, divisions, continuations-in-part, re-examinations, reissues, substitutions, confirmations, registrations, re-validations, patent term extensions, supplementary protection certificates, certificates of invention, and applications for certificates of invention, or the like, of any such patents and patent applications, and any patent application or patent to which any patent or patent application listed on Exhibit A claims priority and (b) any patent application filed after October 5, 2018 solely to the extent that such patent application Covers Licensed Know-How that was both in existence as of October 5, 2018 and necessary to use the Accessory Material Agents in connection with the Research, Development, manufacture or Commercialization of a Licensed Product in the Field.

1.51 "**Licensed Product**" means any Exclusive Product or Non-Exclusive Product and "Licensed Products" collectively means Exclusive Products and Non-Exclusive Products.

1.52 "**MDACC Research Agreement**" means certain Research and Development Agreement by and among Intrexon, Alaunos and The University of Texas M.D. Anderson Cancer Center ("**MDACC**") with an effective date of August 17, 2015, and any amendments or statements of work thereto.

1.53 "**Merck Agreement**" means that certain License and Collaboration Agreement by and among Intrexon, Ziopharm and Ares Trading S.A., a corporation organized and existing under the laws of Switzerland, having offices at Zone Industrielle de L'Ouriettaz, 1170 Aubonne, Switzerland ("**Ares Trading**") effective March 27, 2015, as amended.

1.54 "**NDA**" means a New Drug Application, as defined in the FD&C Act, as amended, and applicable regulations promulgated thereunder by the FDA.

1.55 "**Neo-antigens**" means [*****].

1.56 "**New Product Marks**" has the meaning set forth in Section 6.5.

1.57 "**NK Cells**" means natural killer cells.

1.58 "**NK Cells and Gamma Delta T Cell Products**" means any pharmaceutical or biological product, process or therapy developed under or arising from the NK Cells and Gamma Delta T Cell Program, including all forms, formulations, presentations, doses, administrations and package configurations.

1.59 "**NK Cells and Gamma Delta T Cell Program**" means a program(s) of Research and Development focused on NK Cells and Gamma Delta T Cells.

1.60 "**Non-Exclusive Products**" means (a) NK Cells and Gamma Delta T Cell Products, and (b) TCR Non-Exclusive Products, in each case as generated or Developed by Alaunos. For clarity, Non-Exclusive Products include all forms, formulations, presentations, doses, administrations and package configurations thereof.

1.61 "**Oncology**" means the treatment or prevention of a human patient who has received a cancer diagnosis.

1.62 "**Patents**" means (a) pending patent applications, issued patents, utility models and designs; (b) reissues, substitutions, confirmations, registrations, validations, re-examinations, continuations, continued prosecution applications, continuations-in-part, or divisions of or to any of the foregoing; and (c) extensions, renewals or restorations of any of the foregoing by existing or future extension, renewal or restoration mechanisms, including supplementary protection certificates or the equivalent thereof.

1.63 "**Precigen**" means the Virginia corporation, with its principal place of business at 20358 Seneca Meadows Parkway, Germantown, MD 20876 along with its wholly owned subsidiaries and Affiliates.

1.64 "**Potential Claims**" has the meaning set forth in Section 3.4(a).

1.65 "**Precigen Impact Situation**" has the meaning set forth in Section 6.2(a).

1.66 "**Precigen Indemnitees**" has the meaning set forth in Section 8.2.

1.67 "**Product Infringement**" has the meaning set forth in Section 6.3(b).

1.68 "**Program**" means, as applicable, the TCR Program and the NK Cells and Gamma Delta T Cell Program.

1.69 "**Regulatory Approval**" means all approvals that are necessary for the commercial sale of product in the applicable field in a given country or regulatory jurisdiction.

1.70 "**Regulatory Authority**" means, in a particular country or jurisdiction, any applicable Governmental Authority involved in granting Regulatory Approval in such country or jurisdiction.

1.71 "**Regulatory Materials**" means regulatory applications, submissions, notifications, communications, correspondence, registrations, Regulatory Approvals and/or other filings made to, received from or otherwise conducted with a Regulatory Authority in order to Develop, manufacture, market, sell or otherwise Commercialize a Licensed Product in a particular country or jurisdiction.

1.72 "**Releasees**" has the meaning set forth in Section 3.4(a).

1.73 "**Released Claims**" has the meaning set forth in Section 3.4(a).

1.74 "**Research**" means non-clinical studies of a product conducted before the filing of an IND for such product.

1.75 "**Sleeping Beauty Intellectual Property**" means patent families [*****] and [*****] as detailed in Exhibit A.

1.76 "**Sublicensee**" means any Third Party granted a sublicense, covenant not to sue, forbearance agreement, co-promotion agreement or other similar arrangement (a "**Sublicense**") by Alaunos to the rights licensed to Alaunos under Section 2.1(a) or Section 2.1(b).

1.77 "**T-Cell**" means a T-lymphocyte, including alpha beta T cells and gamma delta T cells.

1.78 "**TCR**" means T-cell receptor complex.

1.79 "**TCR Exclusive Product**" means any biological product, process or therapy that includes a TCR for a Neo-antigen, including all forms, formulations, presentations, doses, administrations and package configurations.

1.80 "**TCR Exclusive Program**" means a program(s) of Research and Development focused on Developing TCRs designed for Neo-antigens.

1.81 "**TCR Non-Exclusive Product**" means any biological product, process or therapy that is comprised of a TCR, other than TCR Exclusive Products, including all forms, formulations, presentations, doses, administrations and package configurations.

1.82 "**TCR Products**" means TCR Non-Exclusive Products and TCR Exclusive Products.

1.83 "**Term**" has the meaning set forth in Section 5.2(b).

1.84 "**Territory**" means all countries of the world.

1.85 "**Third Party**" means any entity other than Precigen or Alaunos or an Affiliate of either of them.

1.86 "**Third Party Licenses**" has the meaning set forth in Section 2.1(e).

1.87 "**Trademark**" means any word, name, symbol, color, shape, designation or device or any combination thereof, including any trademark, service mark, trade name, trade dress, brand name, product configuration, domain name, logo, design or business symbol, that functions as an identifier of source, origin or membership, whether or not registered, and all statutory and common law rights therein, and all registrations and applications therefor, together with all goodwill associated with, or symbolized by, any of the foregoing.

1.88 "**Treat**" means delivery of a therapy to a human patient who has received a cancer diagnosis for the treatment of that cancer, including the prevention of the reoccurrence of any such cancer. "**Treatment**" has its correlative meaning.

1.89 "**U.S.**" means the United States of America, including all possessions and territories thereof.

1.90 "**Valid Claim**" means a claim of an issued, unexpired patent within the Licensed Patents that has not been revoked, disclaimed, abandoned or held invalid or unenforceable by a court or other body of competent jurisdiction in an unappealed or unappealable decision.

1.91 "**Ziopharm Agreement**" means that certain Exclusive Channel Partner Agreement by and between Intrexon and Ziopharm, dated January 6, 2011, as amended by the First Amendment to Exclusive Channel Partner Agreement effective September 13, 2011; the Second Amendment to the Exclusive Channel Partner Agreement effective March 27, 2015 (the "**Second ECP Amendment**") and the Third Amendment to Exclusive Channel Partner Agreement effective June 29, 2016, as assigned by Intrexon to Precigen.

1.92 "**Alaunos Indemnitees**" has the meaning set forth in Section 8.1.

ARTICLE 2
LICENSES AND EXCLUSIVITY

2.1 License to Alaunos for Licensed Products.

(a) License to Alaunos for Exclusive Products. Precigen hereby grants Alaunos a royalty-free, exclusive license (even as to Precigen and its Affiliates except as provided in Section 2.1(c) below), with the right to sublicense through multiple tiers in accordance with Section 2.1(d), under the Licensed Intellectual Property to research, develop, make, have made, use, sell, have sold, offer for sale and import Exclusive Products in the Field in the Territory.

(b) License to Alaunos for Accessory Material Agents and Non-Exclusive Products. Precigen hereby grants Alaunos (i) a non-exclusive, royalty-free license, with the right to sublicense through multiple tiers in accordance with Section 2.1(d), under the Licensed Intellectual Property to research, develop, make, have made, use, sell, have sold, offer for sale and import Non-Exclusive Products in the Field in the Territory, and (ii) an exclusive, royalty-free license, with the right to sublicense in accordance with Section 2.1(d), under the Sleeping Beauty Intellectual Property to research, develop, make, have made, use, sell, have sold, offer for sale and import TCR Non-Exclusive Products in the Field in the Territory. For clarity, the foregoing license grant includes the right to make and have made Accessory Material Agents for use in connection with Licensed Products in the Field.

(c) Precigen Retained Rights. Notwithstanding the rights granted to Alaunos in Section 2.1(a) and 2.1(b), Precigen may research, develop, manufacture and Commercialize (i) products outside of the Exclusive Products in the Field in the Territory (subject to the grant of the exclusive license under the Sleeping Beauty Intellectual Property with respect to TCR Non-Exclusive Products in the Field) and (ii) products outside the Field.

(d) Sublicenses; Assignments.

(i) Alaunos may grant sublicenses through multiple tiers, under any or all of the rights granted in Section 2.1(a) and Section 2.1(b) to its Affiliates.

(ii) Alaunos may grant sublicenses through multiple tiers, under any or all of the rights granted in Section 2.1(a) and Section 2.1(b), to Third Parties solely to the extent reasonably necessary for contract manufacturing activities or Commercialization of Licensed Products with respect to any Licensed Product developed by or on behalf of Alaunos or its Affiliates, following which Alaunos will provide written notice of any such grant to Precigen within 10 business days of such grant.

(iii) Alaunos may grant sublicenses through multiple tiers, under any or all of the rights granted in Section 2.1(a) and Section 2.1(b), to Third Parties in connection with any Research, Development or Commercialization collaboration of such Exclusive Product or TCR Non-Exclusive Product, following which Alaunos will provide written notice of any such grant to Precigen within 10 business days of such grant.

(iv) Except as set forth above, Alaunos shall not have the right to sublicense any or all of the rights granted under this Agreement to Third Parties to Research, Develop, manufacture or Commercialize products of Third Parties without Precigen's prior written consent.

(v) Each agreement in which Alaunos grants a sublicense shall be consistent with the relevant terms and conditions of this Agreement and Alaunos shall provide

such information as reasonably necessary to determine compliance with Section 2.1(d). Alaunos shall remain responsible for the compliance of its Sublicensees with the terms and conditions of this Agreement. Breach by Alaunos' Sublicensees shall be a breach by Alaunos. Alaunos will provide Precigen a quarterly update, if any with respect to terminations or modifications of sublicenses granted under Section 2.1(d).

(e) Third Party Licenses. All Licensed Intellectual Property licensed to Precigen from a Third Party and sublicensed to Alaunos under this Agreement are subject to and subordinate to the terms of the applicable license agreements with Third Parties set forth on Exhibit B (the "**Third Party Licenses**"). Each Party will fully comply with the terms of any such Third Party License, and Alaunos shall remain solely responsible for the payment of any royalty, milestone, and other payment obligations, if any, due to Third Parties in connection with exercise of the licenses granted to Alaunos under this Agreement. Alaunos shall make all such payments timely in accordance with the terms of the applicable Third Party license. Precigen covenants not to, without the prior written consent of Alaunos, amend any Third Party License in such a manner that would diminish the rights granted to Alaunos under this Agreement, materially change any obligations under such Third Party License that would impact Alaunos hereunder or increase any payment obligation of Alaunos pursuant to such Third Party License.

2.2 Exclusivity. Precigen hereby covenants that, during the Patent Term, neither it nor its Affiliates will (a) grant or offer any license or other rights to a Third Party, or otherwise discuss or negotiate with any Third Party the terms of any such license or rights, or (b) conduct any activities, whether independently or with or for the benefit of a Third Party, in each case of (a) and (b) with respect to the use of any Licensed Intellectual Property to research, develop, manufacture or Commercialize any Exclusive Product in the Field or with respect to the use of any Sleeping Beauty Intellectual Property as Covered by [*****] and [*****] to research, develop, manufacture or Commercialize any TCR Product in the Field.

2.3 Development Responsibilities. Alaunos will have the exclusive right to conduct, and be solely responsible for all aspects of, the Research, Development and manufacture of Licensed Products and setting the regulatory strategy for seeking Regulatory Approvals for Licensed Products in the Field in the Territory.

2.4 Regulatory Responsibilities. Alaunos shall have the exclusive right to prepare and shall own all Regulatory Materials (including all INDs, BLAs, NDAs, MAAs and Regulatory Approvals) for each Licensed Product in the Field in the Territory.

2.5 Commercialization Responsibilities. Alaunos will have the exclusive right to conduct in its sole discretion, and be solely responsible for all aspects of, the Commercialization of Licensed Products in the Field in the Territory, including: (a) developing and executing a commercial launch and pre-launch plan, (b) negotiating with applicable Governmental Authorities regarding the price and reimbursement status of Licensed Products; (c) marketing and promotion; (d) booking sales and distribution and performance of related services; (e) handling all aspects of order processing, invoicing and collection, inventory and receivables; (f) providing customer support, including handling medical queries, and performing other related functions; (g) conforming its practices and procedures to applicable Laws relating to the marketing, detailing

and promotion of Licensed Products in the Territory; and (h) manufacturing of Licensed Products for commercial use.

2.6 Development and Commercialization. As of the Effective Date, Alaunos shall have no obligation to further Develop or Commercialize Licensed Products and shall not be liable to Precigen for any failure to do so.

2.7 No Implied Licenses. Except as explicitly set forth in this Agreement, neither Party shall be deemed by estoppel or implication to have granted the other Party any license or other right to any intellectual property of such Party. Precigen specifically reserves all rights not expressly granted to Alaunos under this Agreement.

ARTICLE 3
EXISTING AGREEMENTS

3.1 Termination of Exclusive License Agreement. The Parties hereby agree to amend and restate the ELA Agreement and replace it in its entirety with this Agreement. The Parties acknowledge that the necessary assignments and transition services required under the ELA Agreement have been completed.

3.2 Termination of Ziopharm Agreement. The Parties previously agreed under the ELA Agreement to terminate the Ziopharm Agreement, and the termination of such agreement shall continue. Accordingly, all rights and licenses granted by Intrexon to Alaunos under the Ziopharm Agreement and all rights and licenses granted by Alaunos to Intrexon, such rights and licenses assigned by Intrexon to Precigen, under the Ziopharm Agreement shall terminate. For clarity, the Parties acknowledge and agree that the provisions of Section 10.4 of the Ziopharm Agreement did not apply to this termination of the Ziopharm Agreement by mutual written consent. Section 6.1 of the Second ECP Amendment did not survive termination of the Ziopharm Agreement. In the event of any conflict between the surviving terms of the Ziopharm Agreement and the terms of this Agreement, the terms of this Agreement shall control.

3.3 MDACC Research Agreement and 2015 MDACC License. Precigen shall retain rights to all intellectual property and materials received through the MDACC Research Agreement and 2015 MDACC License prior to the October 5, 2018, such right being licensed herein as part of the Licensed Intellectual Property.

3.4 Mutual Release and Covenant Not to Sue.

(a) The Parties, on behalf of themselves, their predecessors, successors, direct and indirect parent companies, direct and indirect subsidiary companies, companies under common control with any of the foregoing, affiliates and assigns, and its and their past, present, and future officers, directors, shareholders, interest holders, members, partners, attorneys, agents, employees, insurers, managers, representatives, assigns and successors in interest, and all persons acting by, through, under or in concert with them, and each of them, hereby release and discharge the other Parties, together with their predecessors, successors, direct and indirect parent companies, direct and indirect subsidiary companies, companies under common control with any of the foregoing, affiliates and assigns and its and their past, present, and future officers, directors, shareholders, interest holders, members, partners, attorneys, agents, employees, managers, representatives,

assigns and successors in interest, and all persons acting by, through, under or in concert with them, and each of them (the Parties' "**Releasees**", as applicable), from all known and unknown charges, complaints, claims, grievances, liabilities, obligations, promises, agreements, controversies, damages, actions, causes of action, suits, rights, demands, costs, losses, debts, penalties, fees, wages, medical costs, pain and suffering, mental anguish, emotional distress, expenses (including attorneys' fees and costs actually incurred) and punitive damages, of any nature whatsoever, known or unknown, which either Party has, or may have had, against the other Party, whether or not apparent or yet to be discovered, or which may hereafter develop ("**Potential Claims**"), for any acts or omissions, prior to the Effective Date, related to or arising from the ELA Agreement, the Ziopharm Agreement, including but not limited to the Second ECP Amendment, the Merck Agreement, the MDAAC Research Agreement, and each other agreement between Ziopharm and either Precigen or Intrexon, (the "**Released Claims**"). For avoidance of doubt, the Released Claims shall not include any Potential Claims: (a) for acts or omissions that occur on or after the Effective Date or (b) related to or arising from any rights or obligations set forth in this Agreement.

(b) Each Party agrees and hereby covenants that it will not, directly or indirectly, on its own behalf or acting on behalf of or through any other person or entity, initiate or maintain any lawsuit, arbitration or other proceeding, whether legal or equitable, against any other Party or its Releasees, arising from or related to the Released Claims.

(c) Alaunos hereby grants to Precigen a covenant not to sue for infringement for Precigen's Development or Commercialization of the Formerly Licensed Products based on any patent application filed by Alaunos prior to the Effective Date.

ARTICLE 4
TECHNOLOGY AND INVENTORY TRANSFER; REGULATORY

4.1 Transfer of Licensed Know-How; Ongoing Transfers.

(a) Precigen Transfer to Alaunos. All technology transfer and assignments due to Alaunos under the ELA Agreement are complete.

(b) Alaunos Transfer to Precigen. Within the sixty (60) day period following the Effective Date, Alaunos will provide Precigen copies of all electronic regulatory files, FDA communications and material data Information and materials including Accessory Material Agents solely relating to any of the Formerly Licensed Products previously developed by Alaunos, in each case that are in Alaunos' possession and Control, to the extent available to current employees of Alaunos after a reasonable search. Alaunos hereby grants to Precigen a right to reference all data Controlled by Alaunos as of the Effective Date solely pertaining to any of the Formerly Licensed Products previously developed by Alaunos. Alaunos agrees to execute any reasonable formalized letter necessary to grant Precigen's right of reference. With respect to hard copy of documents related to the Formerly Licensed Products, the Parties will work to complete any transfer or destruction (other than anything required for retention by the FDA) within six (6) months of the Effective Date.

4.2 Historical GMP Materials and IL-12 Product Supply; Required Retention and Inventory Destruction. Subject to any applicable statutes, regulations and written directives of the FDA, including which may require retention of information and samples of materials, Alaunos shall be responsible for the destruction of its existing inventory of GMP materials related to CD-19, BCMA, and the IL-12 Product (including all final product, drug substance, intermediates, works-in-process, formulation materials, reference standards, drug product clinical reserve samples, packaged retention samples, and the like) that is then in the possession and Control of Alaunos or its Affiliates or Sublicensees, and shall provide notice of such destruction within sixty (60) days of confirmation by Precigen it does not wish to have any such materials transferred at Precigen request and cost. Precigen shall notify Alaunos with respect to such materials no later than sixty (60) days from the Effective Date.

4.3 DMF Transfer. Within sixty (60) days following the Effective Date, Alaunos will execute documents necessary to assign or transfer the right to reference and use any Drug Master Files (DMFs) solely related to the Formerly Licensed Products developed by Alaunos, in each case that are in Alaunos' possession and Control, after a reasonable search.

ARTICLE 5
COMPENSATION

5.1 Annual Licensing Payments. Within five (5) Business Days after October 5, 2023 and each anniversary of the Effective Date during the Patent Term, Alaunos shall pay to Precigen an annual license payment of seventy-five thousand Dollars ($75,000).

5.2 No Alaunos Royalties on Licensed Products.

(a) Alaunos Exclusive and Non-Exclusive Products. Alaunos shall not owe royalties to Precigen for the sale or sublicensing of any Exclusive or Non-Exclusive Product.

(b) Term. The "**Term**" with respect to the Licensed Patents shall be until the expiration or abandonment of the last-to-expire Valid Claim in such country Covering such Licensed Product (a "**Covering Claim**" in such country for such Licensed Product) (the "**Patent Term**"). The Term with respect to the Licensed Know-How shall be royalty-fee, perpetual and irrevocable following the Term of the subject Licensed Patents ("**Perpetual Licensed Know-How**"). Notwithstanding the license grant, following expiration of the Patent Term on a case-by-case, country-by-country basis, the Perpetual Licensed Know-How will become non-exclusive.

5.3 No Precigen Royalties.

Precigen shall not owe any royalties to Alaunos for any products.

5.4 Taxes on Income. Each Party shall be solely responsible for the payment of all taxes imposed on its income arising directly or indirectly from the efforts of the Parties under this Agreement.

ARTICLE 6
INTELLECTUAL PROPERTY MATTERS

6.1 Ownership of Inventions.

(a) Activities by Alaunos. Unless provided for otherwise herein, Alaunos shall own all Information and inventions, whether or not patentable, made in the course of Alaunos' Research, Development, manufacture and Commercialization of Licensed Products after the Effective Date.

(b) Alaunos Veledimex Alterations. Precigen shall own all Alaunos Veledimex Alterations, whether or not patentable, made in the course of Alaunos' Research, Development, manufacture and Commercialization of Formerly Licensed Products. Alaunos hereby assigns to Precigen any and all right, title and interest it may have in any such Alaunos Veledimex Alterations, and agrees to take such further actions as reasonably requested by Precigen to evidence such assignment. Alaunos will require all of its employees, consultants, agents and contractors, and will cause its Affiliates and subcontractors to require all of their employees, consultants, agents and contractors to assign all Alaunos Veledimex Alterations that are conceived, generated or otherwise made by such employees, consultants, agents and contractors to it, respectively, for further assignment according to the ownership principles described in this Section 6.1(b).

6.2 Prosecution of Licensed Patents.

(a) Generally. Subject to Section 6.2(b), as between the Parties, Precigen shall have the right, but not the obligation, to prepare, file, prosecute and maintain the Licensed Patents in the Territory. As between the Parties, Precigen shall bear all costs incurred by Precigen in connection with the preparation, filing, prosecution or maintenance of any Licensed Patent. Precigen shall consult with Alaunos and keep Alaunos reasonably informed of the status of the Licensed Patents and shall promptly provide Alaunos with copies of all material correspondence received from any patent authority in connection therewith to the extent not publicly available. In addition, Precigen shall timely provide Alaunos with drafts of all proposed filings and correspondence to any patent authority with respect to the Licensed Patents (which could reasonably be considered to Cover a Licensed Product) in the Field for Alaunos' review and comment prior to the submission of such proposed filings and correspondence. Precigen shall confer with Alaunos and incorporate Alaunos' comments prior to submitting such filings and correspondence, provided, that Alaunos' comments do not require Precigen to take any action in connection with the Licensed Patents that could reasonably be expected to adversely affect Precigen's or its Affiliate's Development or Commercialization of (i) products (other than Licensed Products) claimed by such Licensed Patent inside or outside the Field in the Territory or (ii) Licensed Products claimed by such Licensed Patent outside the Field in the Territory (a "**Precigen Impact Situation**"). If in either Party's opinion, a Precigen Impact Situation could arise, such Party will promptly notify the other Party and the Parties shall discuss in good faith. Precigen shall have final decision authority with respect to whether or not to incorporate such comments. The Parties will work together to first determine if such claim could reasonably be considered to Cover a Licensed Product in the Field. If the claims in the pending case are determined not to Cover a Licensed Product, Precigen will not have an obligation to share prosecution for comment as opposed to for information only. However, if Precigen broadens the scope of the claims or files a continuation or divisional Precigen and Alaunos will again evaluate the claims to determine if the pending case Covers a Licensed Product.

(b) New Patent Applications. Notwithstanding Section 6.2(a), if after consultation with Alaunos, Precigen agrees that a new patent application (including, with respect to Sleeping Beauty Intellectual Property, a divisional application) should be filed based on the Licensed Know-How, such patent applications shall be deemed Licensed Patents subject to further prosecution and maintenance in accordance with Section 6.2(a). Precigen shall reasonably consult with Alaunos regarding the drafting and filing of such new patent applications and shall reasonably consider any comments provided by Alaunos related thereto. For the avoidance of doubt, Precigen shall have authority with respect to such new patent applications (or divisional application) filing, prosecution and maintenance decisions in accordance with Section 6.2(a).

(c) Abandonment. If Precigen decides anywhere in the Territory to abandon any Licensed Patent in the Field, Alaunos may assume Precigen's rights and responsibilities under this Section 6.2 with respect to such Licensed Patent, and in connection with assuming such rights and responsibilities, Alaunos may apply for any extension (including a supplementary protection certificate or equivalent thereof) and Alaunos will thereafter be responsible for the prosecution and maintenance of such Licensed Patent in the Field in the Territory.

(d) Cooperation. Each Party shall provide the other Party all reasonable assistance and cooperation, at the other Party's request and expense, in the patent prosecution efforts provided above in this Section 6.2, including providing any necessary powers of attorney, executing any other required documents or instruments for such prosecution, and making its personnel with appropriate scientific expertise available to assist in such efforts.

6.3 Enforcement of Licensed Patents.

(a) Notification. If either Party becomes aware of (i) any existing or threatened infringement of the Licensed Patents in the Field in the Territory (including the filing of an ANDA under Section 505(j) of the FD&C Act or an application under Section 505(b)(2) of the FD&C Act naming a Licensed Product as a reference listed drug and including a certification under Section 505(j)(2)(A)(vii)(IV) or 505(b)(2)(A)(IV), respectively), or (ii) a declaratory judgment action against any Licensed Patent in the Territory in connection with any infringement described in clause (i) (each of (i) and (ii), a "**Patent Infringement**"), it shall promptly notify the other Party in writing to that effect, and the Parties will consult with each other regarding any actions to be taken with respect to such Patent Infringement.

(b) Enforcement Rights. For any Patent Infringement, each Party shall share with the other Party all Information available to it regarding such actual or alleged infringement. With respect to any Patent Infringement by a product that competes with an Exclusive Product in the Field (a "**Product Infringement**"). If a Licensed Patent is the only patent covering such Product Infringement, Alaunos will notify Precigen. Once Precigen confirms there are no other patents Alaunos could bring for Product Infringement and if the only Licensed Patent is a member of patent family [*****], or [*****] then Alaunos shall have the first right, but not the obligation, to bring an appropriate suit or take other action against any person or entity engaged in, or to defend against, such Product Infringement, at Alaunos' cost and expense. Alaunos shall not settle any such suit or action in any manner that would reasonably be expected to (i) require Precigen to incur any liability (ii) require Precigen to make any payments, or (iii) would reasonably be expected to adversely affect Precigen's Development or Commercialization of products, in each case without

the prior written consent of Precigen. If Alaunos does not, within one hundred eighty (180) days after its receipt or delivery of notice under Section 6.3(a), commence a suit to enforce the Licensed Patent against such Product Infringement, take other action to terminate such Product Infringement or initiate a defense against such Product Infringement, Precigen shall have the right, but not the obligation, to commence such a suit or take such an action or defend against such Product Infringement in the Territory at its own cost and expense. Precigen shall not settle any such suit or action in any manner that (i) require Alaunos to incur any liability, (ii) require Alaunos to make any payments, or (iii) would reasonably be expected to adversely affect Alaunos' Development or Commercialization of products in each case without the prior written consent of Precigen. If such Product Infringement is related to [*****] and such Licensed Patent is the only patent covering such Product Infringement and Precigen has confirmed there are no other patents Alaunos could bring for Product Infringement, Precigen shall have the first right, but not the obligation, to bring an appropriate suit or take other action against any person or entity engaged in, or to defend against, such Product Infringement, at Precigen's cost and expense. Precigen shall not settle any such suit or action in any manner that would reasonably be expected to (i) require Alaunos to incur any liability or (iii) require Alaunos to make any payments, in each case without the prior written consent of Alaunos. If Precigen does not, within one hundred eighty (180) days after its receipt or delivery of notice under Section 6.3(a), commence a suit to enforce the Licensed Patent against such Product Infringement, take other action to terminate such Product Infringement or initiate a defense against such Product Infringement, Alaunos shall have the right, but not the obligation, to commence such a suit or take such an action or defend against such Product Infringement in the Territory at its own cost and expense. Alaunos shall not settle any such suit or action in any manner that would reasonably be expected to (i) require Precigen to incur any liability (ii) require Precigen to make any payments, or (iii) would reasonably be expected to adversely affect Precigen's Development or Commercialization of products, in each case without the prior written consent of Precigen.

(c) Collaboration. Each Party shall provide to the enforcing Party reasonable assistance in such enforcement, at such enforcing Party's request and expense, including joining such action as a party plaintiff if required by applicable Laws to pursue such action. The enforcing Party shall keep the other Party regularly informed of the status and progress of such enforcement efforts and shall reasonably consider the other Party's comments on any such efforts. The non-enforcing Party shall be entitled to separate representation in such matter by counsel of its own choice and at its own expense, but such Party shall at all times cooperate fully with the enforcing Party.

(d) Expenses and Recoveries. The Party bringing or defending a claim, suit or action under Section 6.3(b) shall be solely responsible for any expenses incurred by such Party as a result of such claim, suit or action. If such Party recovers monetary damages in such claim, suit or action, such recovery shall be allocated first to the reimbursement of any expenses incurred by the Party or Parties in such litigation, and any remaining amounts shall be allocated [*****] between the Parties.

6.4 Orange Book Listing. Upon receipt of a notice of allowance (or equivalent) of an applicable Licensed Patent, Alaunos shall inform Precigen and request information reasonably required by Alaunos to list any Licensed Patent in the Orange Book maintained by the FDA or similar or equivalent patent listing source, if any, in other countries in the Territory with respect to

such Licensed Product. Alaunos shall have the sole right to determine which Licensed Patent or other patent shall be included in the Orange Book for Licensed Products.

6.5 Trademarks.

(a) New Product Marks. Alaunos and its Affiliates and Sublicensees shall have the right to brand the Licensed Products in the Territory using any Trademarks it determines appropriate for the Licensed Products, which may vary by country or within a country (the "**New Product Marks**"), provided that Alaunos shall not, and shall ensure that its Affiliates and Sublicensees will not, make any use of the trademarks or house marks of Precigen (including Precigen's corporate name) or any trademark confusingly similar thereto. As between the Parties, Alaunos shall own all rights in the New Product Marks and shall register and maintain, in its discretion and at its own cost and expense, the New Product Marks in the countries and regions in the Territory that it determines to be appropriate. Alaunos shall have the sole right, in its discretion and at its expense, to defend and enforce the New Product Marks.

ARTICLE 7
REPRESENTATIONS AND WARRANTIES

7.1 Mutual Representations and Warranties. Each Party hereby represents and warrants to the other Party as follows:

(a) Corporate Existence. As of the Effective Date, it is a company or corporation duly organized, validly existing, and in good standing under the Laws of the jurisdiction in which it is incorporated.

(b) Corporate Power, Authority and Binding Agreement. As of the Effective Date, (i) it has the corporate power and authority and the legal right to enter into this Agreement and perform its obligations hereunder; (ii) it has taken all necessary corporate action on its part required to authorize the execution and delivery of this Agreement and the performance of its obligations hereunder; and (iii) this Agreement has been duly executed and delivered on behalf of such Party, and constitutes a legal, valid, and binding obligation of such Party that is enforceable against it in accordance with its terms.

(c) No Conflicts. It has not entered into any agreement with any Third Party that is in conflict with the rights granted to any other Party under this Agreement, and has not taken and shall not take any action that would in any way prevent it from granting the rights granted to any other Party under this Agreement, or that would otherwise materially conflict with or adversely affect any other Party's rights under this Agreement.

7.2 Representations and Warranties of Alaunos. Alaunos hereby represents and warrants to Precigen as follows:

(a) No Ongoing Clinical Trials Relating to Formerly Licensed Products. As of the Effective Date, Alaunos has terminated active enrollment in all clinical trials related to the Formerly Licensed Products but there are FDA-required long term follow up programs which continue which cannot be terminated.

(b) Terminated Contracts Relating to Formerly Licensed Products. Alaunos has terminated all contracts for research programs and collaborations it previously had with Third Parties to the extent relating to the Formerly Licensed Products. Alaunos has no existing licenses with a Third Party to the Formerly Licensed Products.

7.3 Representations and Warranties of Precigen. Precigen hereby represents and warrants to Alaunos that it has the right to grant the licenses that it grants to Alaunos under this Agreement.

7.4 Mutual Covenants.

(a) No Conflicts. Each Party shall not enter into any agreement with any Third Party that is in conflict with the rights, licenses and obligations under this Agreement, and has not taken and shall not take any action that would in any way prevent it from granting the rights granted to the other Party under this Agreement.

7.5 Disclaimer. EXCEPT AS EXPRESSLY STATED IN THIS AGREEMENT, NO REPRESENTATIONS OR WARRANTIES WHATSOEVER, WHETHER EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, NON-INFRINGEMENT, OR NON-MISAPPROPRIATION OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS, ARE MADE OR GIVEN BY OR ON BEHALF OF A PARTY, AND ALL REPRESENTATIONS AND WARRANTIES, WHETHER ARISING BY OPERATION OF LAW OR OTHERWISE, ARE HEREBY EXPRESSLY EXCLUDED.

ARTICLE 8
INDEMNIFICATION

8.1 Indemnification by Precigen. Precigen shall defend, indemnify, and hold Alaunos and its Affiliates and their respective officers, directors, employees, and agents (the "**Alaunos Indemnitees**") harmless from and against any and all damages or other amounts payable to a Third Party claimant, as well as any reasonable attorneys' fees and costs of litigation incurred by such Alaunos Indemnitees, resulting from any claims, suits, proceedings or causes of action brought by such Third Party (collectively, "**Claims**") against such Alaunos Indemnitee to the extent arising from or based on (a) the Research, Development or Commercialization of any Formerly Licensed Products, including by or on behalf of, or under license of, Precigen or its Affiliates, after the Effective Date (b) the Merck Agreement, (c) the breach of any of Precigen's obligations, representations or warranties under this Agreement, or (d) the willful misconduct or gross negligence of Precigen, its Affiliates, or the officers, directors, employees, or agents of Precigen or its Affiliates. The foregoing indemnity obligation shall not apply to the extent that (i) the Alaunos Indemnitees fail to comply with the indemnification procedures set forth in Section 8.3 and Precigen's defense of the relevant Claims is prejudiced by such failure, or (ii) any Claim arises from or is based on any activity set forth in Section 8.2(b) or 8.2(c) for which Alaunos is obligated to indemnify the Precigen Indemnitees under Section 8.2.

8.2 Indemnification by Alaunos. Alaunos shall defend, indemnify, and hold Precigen, Intrexon and their Affiliates and their respective officers, directors, employees, and agents (the

"**Precigen Indemnitees**") harmless from and against damages or other amounts payable to a Third Party claimant, as well as any reasonable attorneys' fees and costs of litigation incurred by such Precigen Indemnitees, resulting from any Claims against such Precigen Indemnitee to the extent arising from or based on (a) the Development or Commercialization of Licensed Products by or on behalf of Alaunos or its Affiliates or Sublicensees, (b) the Research, Development or Commercialization of any Formerly Licensed Products, including by or on behalf of, or under license of, Alaunos or its Affiliates, Third Party collaborators, or Sublicensees, prior to the Effective Date (c) the breach of any of Alaunos' obligations, representations or warranties under this Agreement, (d) Alaunos' breach of the MDACC Research Agreement or 2015 MDACC License, each as amended pursuant to the Agreement or (e) the willful misconduct or gross negligence of Alaunos, its Affiliates, or the officers, directors, employees, or agents of Alaunos or its Affiliates. The foregoing indemnity obligation shall not apply to the extent that (i) the Precigen Indemnitees fail to comply with the indemnification procedures set forth in Section 8.3 and Alaunos' defense of the relevant Claims is prejudiced by such failure, or (ii) any Claim arises from or is based on any activity set forth in Section 8.1(c) or 8.1(d) for which Precigen is obligated to indemnify the Alaunos Indemnitees under Section 8.1.

8.3 Indemnification Procedures. The Party claiming indemnity under this Section 8.3 (the "**Indemnified Party**") shall give written notice to the Party from whom indemnity is being sought (the "**Indemnifying Party**") promptly after learning of such Claim. The Indemnified Party shall provide the Indemnifying Party with reasonable assistance, at the Indemnifying Party's expense, in connection with the defense of the Claim for which indemnity is being sought. The Indemnified Party may participate in and monitor such defense with counsel of its own choosing at its sole expense; provided, however, the Indemnifying Party shall have the right to assume and conduct the defense of the Claim with counsel of its choice. The Indemnifying Party shall not settle any Claim without the prior written consent of the Indemnified Party, not to be unreasonably withheld, unless the settlement involves only the payment of money. So long as the Indemnifying Party is actively defending the Claim in good faith, the Indemnified Party shall not settle or compromise any such Claim without the prior written consent of the Indemnifying Party. If the Indemnifying Party does not assume and conduct the defense of the Claim as provided above, (a) the Indemnified Party may defend against, consent to the entry of any judgment, or enter into any settlement with respect to such Claim in any manner the Indemnified Party may deem reasonably appropriate (and the Indemnified Party need not consult with, or obtain any consent from, the Indemnifying Party in connection therewith), and (b) the Indemnifying Party shall remain responsible to indemnify the Indemnified Party as provided in this Section 8.3.

8.4 Limitation of Liability. NEITHER PARTY SHALL BE LIABLE TO THE OTHER FOR ANY SPECIAL, CONSEQUENTIAL, INCIDENTAL, PUNITIVE, OR INDIRECT DAMAGES ARISING FROM OR RELATING TO ANY BREACH OF THIS AGREEMENT, REGARDLESS OF ANY NOTICE OF THE POSSIBILITY OF SUCH DAMAGES. NOTWITHSTANDING THE FOREGOING, NOTHING IN THIS SECTION 8.4 IS INTENDED TO OR SHALL LIMIT OR RESTRICT THE INDEMNIFICATION RIGHTS OR OBLIGATIONS OF ANY PARTY UNDER SECTION 8.1 OR 8.2 OR DAMAGES AVAILABLE FOR BREACH OF ARTICLE 9.

8.5 Insurance. Each Party shall procure and maintain insurance, including product liability insurance, consistent with normal business practices of prudent companies similarly

situated at all times during which any Licensed Product is being clinically tested in human subjects or commercially distributed or sold by such Party and for the three (3) year period thereafter. It is understood that such insurance shall not be construed to create a limit of either Party's liability with respect to its indemnification obligations under this Section 8.5. Each Party shall provide the other Party with written evidence of such insurance upon request. Each Party shall provide the other Party with written notice at least thirty (30) days prior to the cancellation or non-renewal of such insurance.

ARTICLE 9
CONFIDENTIALITY

9.1 Confidentiality. Each Party agrees that, during the Term and for a period of ten (10) years thereafter, it shall keep confidential and shall not publish or otherwise disclose and shall not use for any purpose other than as provided for in this Agreement (which includes the exercise of any rights or the performance of any obligations hereunder) any Confidential Information furnished to it by the other Party pursuant to this Agreement, except to the extent expressly authorized by this Agreement or otherwise agreed in writing by the Parties; provided, however, that any Confidential Information that is considered a "trade secret" shall remain subject to the confidentiality provisions herein for so long as such Confidential Information maintains its "trade secret" status. The foregoing confidentiality and non-use obligations shall not apply to any portion of the other Party's Confidential Information that the receiving Party can demonstrate by competent written proof:

(a) was already known to the receiving Party or its Affiliate, other than under an obligation of confidentiality, at the time of disclosure by the other Party;

(b) was generally available to the public or otherwise part of the public domain at the time of its disclosure to the receiving Party;

(c) became generally available to the public or otherwise part of the public domain after its disclosure and other than through any act or omission of the receiving Party in breach of this Agreement;

(d) was disclosed to the receiving Party or its Affiliate by a Third Party who has a legal right to make such disclosure and who did not obtain such information directly or indirectly from the other Party; or

(e) was independently discovered or developed by the receiving Party or its Affiliate without access to or aid, application or use of the other Party's Confidential Information, as evidenced by a contemporaneous writing.

9.2 Authorized Disclosure. Notwithstanding the obligations set forth in Section 9.1, a Party may disclose the other Party's Confidential Information and the terms of this Agreement to the extent such disclosure is reasonable necessary in the following instances:

(a) filing, prosecuting, or maintaining Patents as permitted by this Agreement;

(b) prosecuting or defending litigation as permitted by this Agreement;

(c) disclosure to its and its Affiliates' employees, agents, consultants and contractors, on a need-to-know basis for the sole purpose of performing its obligations or exercising its rights under this Agreement; provided that in each case, the disclosees are bound by written obligations of confidentiality and non-use consistent with those contained in this Agreement; or

(d) disclosure to potential and actual: investors, acquirors (of part or all of the shares and/or assets of a Party or an Affiliate), collaborators, licensors, licensees and sublicensees and other financial or commercial partners, solely for the purpose of evaluating or carrying out an actual or potential investment, acquisition, collaboration, license or sublicense; provided that in each case, the discloses are bound by written obligations of confidentiality and non-use consistent with those contained in this Agreement (provided that the term of such obligations may be shorter); or

(e) to comply with applicable Laws, including regulations promulgated by applicable security exchanges, court order, administrative subpoena or order; provided that the Party subject to such Laws shall promptly notify the other Party of such required disclosure and shall use reasonable efforts to obtain, or to assist the other Party in obtaining, a protective order preventing or limiting the required disclosure.

Notwithstanding the foregoing, if a Party is required to make a disclosure of the other Party's Confidential Information pursuant to Section 9.2(e), such Party shall notify the other Party of such required disclosure as far in advance as reasonably practicable (and in no event less than fifteen (15) Business Days prior to the anticipated date of disclosure) to provide the non-disclosing Party opportunity to review and comment upon the disclosure.

9.3 Publicity; Terms of Agreement.

(a) The Parties agree that the material terms of this Agreement are the Confidential Information of both Parties, subject to the special authorized disclosure provisions set forth in this Section 9.3 or Section 9.2. In addition, a Party may disclose such terms to the extent reasonably necessary to be disclosed to any bona fide potential or actual investor, acquiror or merger partner for the sole purpose of evaluating an actual or potential investment, acquisition or merger; provided that in connection with such disclosure, such Party shall inform each disclosee of the confidential nature of such Confidential Information and ensure that each such disclosee is contractually obligated to treat such Confidential Information as confidential.

(b) The Parties acknowledge that either or both Parties may be obligated to file under applicable Laws a copy of this Agreement with the U.S. Securities and Exchange Commission or other Governmental Authorities. Each Party shall be entitled to make such a required filing, provided that it requests confidential treatment of the commercial terms and sensitive technical terms hereof and thereof to the extent such confidential treatment is reasonably available to such Party. In the event of any such filing, each Party will provide the other Party with a copy of this Agreement marked to show provisions for which such Party intends to seek confidential treatment and shall reasonably consider and incorporate the other Party's reasonable comments thereon to the extent consistent with the legal requirements, with respect to the filing

Party, governing disclosure of material agreements and material information that must be publicly filed.

ARTICLE 10
TERM AND TERMINATION

10.1 Term. This Agreement shall become effective on the Effective Date and, unless earlier terminated pursuant to this Article 10 shall remain in effect on a Licensed Product-by-Licensed Product and country-by-country basis, until the expiration of the Patent Term, except as provided in Section 5.2(b).

10.2 Unilateral Termination by Alaunos. Alaunos may terminate this Agreement, on a country-by-country, Program-by-Program, or Licensed Patent-by-Licensed Patent basis or in its entirety, for any or no reason upon written notice to Precigen. Upon any such termination of this Agreement by Alaunos, the license rights with respect to the applicable country, Program or Licensed Patent, as the case may be, shall terminate, and the then remaining license rights under this Agreement shall continue and survive.

10.3 Termination by Either Party for Breach.

(a) Breach. Subject to Section 10.3(b), each Party shall have the right to terminate this Agreement upon written notice to the other Party if such other Party materially breaches its obligations under this Agreement and, after receiving written notice from the non-breaching Party identifying such material breach in reasonable detail, fails to cure such material breach within sixty (60) days from the date of such notice; provided that if such breach is not reasonably capable of cure within such sixty (60)-day period, the breaching Party may submit a reasonable cure plan prior to the end of such sixty (60)-day period, in which case the other Party shall not have the right to terminate this Agreement for so long as the breaching Party is using commercially reasonable efforts to implement such cure plan.

(b) Disputed Breach. If the alleged breaching Party disputes in good faith the existence or materiality of a breach specified in a notice provided by the other Party in accordance with Section 10.3(a), and such alleged breaching Party provides the other Party notice of such dispute within such sixty (60)-day period, then the non-breaching Party shall not have the right to terminate this Agreement under Section 10.3(a) unless and until the arbitrators, in accordance with Section 11.2, has determined that the alleged breaching Party has materially breached the Agreement and that such Party fails to cure such breach within sixty (60) days following such arbitrators' decision. During the pendency of such dispute, all of the terms and conditions of this Agreement shall remain in effect and the Parties shall continue to perform all of their respective obligations hereunder. Except with respect to breaches of payment obligations, the Parties agree that a breach with respect to a Licensed Product shall not itself be deemed to be a breach with respect to other Licensed Products and any termination of this Agreement shall be limited to the Licensed Product or Licensed Products for which a Party breached its obligations hereunder. Nothing in this Section 10.3 shall limit a Party's ability to seek remedies available under this Agreement in law or equity.

10.4 Survival. Termination or expiration of this Agreement shall not affect any rights or obligations of the Parties under this Agreement that have accrued prior to the date of termination or expiration. Notwithstanding anything to the contrary, the following provisions shall survive any expiration or termination of this Agreement: Articles 1 (to the extent definitions are used in the following sections or portions thereof), Article 8, Article 9, Article 11, and Article 12 and individual Sections: 2.7, 3.4, 5.2., 5.3, 5.4, 6.1, 6.5, 7.5, 10.1 and 10.4. If this Agreement is terminated with respect to a given Licensed Product, but not in its entirety, then following such termination the foregoing provisions of this Agreement shall remain in effect with respect to the Licensed Product(s) for which the termination is applicable (to the extent they would survive and apply in the event the Agreement expires or is terminated in its entirety) and all provisions not surviving in accordance with the foregoing shall terminate with respect to the relevant Licensed Product for which the termination applies, as applicable, upon the effective date of termination thereof.

ARTICLE 11
DISPUTE RESOLUTION

11.1 Disputes. It is the objective of the Parties to establish procedures to facilitate the resolution of disputes arising under this Agreement in an expedient manner by mutual cooperation and without resort to litigation. In the event of any disputes, controversies or differences which may arise between the Parties out of or in relation to or in connection with this Agreement, including, without limitation, any alleged failure to perform, or breach, of this Agreement, or any issue relating to the interpretation or application of this Agreement (each, a "**Dispute**"), then upon the request of either Party by written notice, the Parties agree to meet and discuss in good faith a possible resolution thereof, which good faith efforts shall include at least one in-person meeting between the Executive Officers of each Party. If the matter is not resolved within thirty (30) days following the written request for discussions, either Party may then invoke the provisions of Section 11.2.

11.2 Arbitration. Any Dispute that is not resolved pursuant to Section 12.1 shall, subject to Section 12.10, be shall resolved by binding arbitration administered by the American Arbitration Association ("**AAA**") (or its successor entity) in accordance with the then current Commercial Rules of the American Arbitration Association including the Procedures for Large, Complex Commercial Disputes (including the Optional Rules for Emergency Measures of Protection) (the "**AAA Rules**"), except as modified in this Agreement, which AAA Rules are deemed to be incorporated by reference into this clause. The decision rendered in any such arbitration will be final, binding and unappealable. The arbitration shall be conducted by a panel of three (3) arbitrators appointed in accordance with the AAA Rules, none of whom shall be a current or former employee or director, or a then-current stockholder, of either Party, their respective Affiliates or any Sublicensee. The place of arbitration shall be New York, New York, U.S., and all proceedings and communications shall be in English. It is the intention of the Parties that discovery, although permitted as described herein, will be limited except in exceptional circumstances. The arbitrators will permit such limited discovery necessary for an understanding of any legitimate issue raised in the arbitration, including the production of documents. No later than thirty (30) days after selection of the arbitrators, the Parties and their representatives shall

hold a preliminary meeting with the arbitrators, to mutually agree upon and thereafter follow procedures seeking to assure that the arbitration will be concluded within six (6) months from such meeting. Failing any such mutual agreement, the arbitrators will design and the Parties shall follow procedures to such effect.

11.3 Governing Law. This Agreement shall be governed by and construed under the substantive laws of the State of New York, excluding any conflicts or choice of law rule or principle that might otherwise refer construction or interpretation of this Agreement to the substantive law of another jurisdiction.

11.4 Award. Any award to be paid by one Party to the other Party as determined by the arbitrator(s) as set forth above under Section 11.2 shall be promptly paid in United States dollars free of any tax, deduction or offset; and any costs, fees or taxes incident to enforcing the award shall, to the maximum extent permitted by law, be charged against the losing Party. Each Party agrees to abide by the award rendered in any arbitration conducted pursuant to this Section 11.4, and agrees that, subject to the United States Federal Arbitration Act, 9 U.S.C. §§ 1-16, judgment may be entered upon the final award in any United States District Court located in New York and that other courts may award full faith and credit to such judgment in order to enforce such award. The award shall include interest from the date of any damages incurred for breach of the Agreement, and from the date of the award until paid in full, at a rate fixed by the arbitrator(s). With respect to money damages, nothing contained herein shall be construed to permit the arbitrator(s) or any court or any other forum to award consequential, incidental, special, punitive or exemplary damages. By entering into this agreement to arbitrate, the Parties expressly waive any claim for consequential, incidental, special, punitive or exemplary damages. The only damages recoverable under this Agreement are direct compensatory damages.

11.5 Costs. Each Party shall bear its own legal fees. The arbitrator(s) shall assess his or her costs, fees and expenses against the Party losing the arbitration.

11.6 Injunctive Relief. Nothing in this Article 11 will preclude either Party from seeking equitable relief or interim or provisional relief from a court of competent jurisdiction, including a temporary restraining order, preliminary injunction or other interim equitable relief, concerning a dispute either prior to or during any arbitration if necessary to protect the interests of such Party or to preserve the status quo pending the arbitration proceeding. For the avoidance of doubt, nothing in this Section 11.6 shall otherwise limit a breaching Party's opportunity to cure a material breach as permitted in accordance with Section 10.3.

11.7 Confidentiality. The arbitration proceeding shall be confidential and the arbitrator(s) shall issue appropriate protective orders to safeguard each Party's Confidential Information. Except as required by law, no Party shall make (or instruct the arbitrator(s) to make) any public announcement with respect to the proceedings or decision of the arbitrator(s) without prior written consent of the other Party. The existence of any dispute submitted to arbitration, and the award, shall be kept in confidence by the Parties and the arbitrator(s), except as required in connection with the enforcement of such award or as otherwise required by applicable law.

11.8 Survivability. Any duty to arbitrate under this Agreement shall remain in effect and be enforceable after termination of this Agreement for any reason.

11.9 Jurisdiction. For the purposes of this Article 11, the Parties acknowledge their diversity and agree to accept the jurisdiction of any United States District Court located in New York for the purposes of enforcing or appealing any awards entered pursuant to this Article 11 and for enforcing the agreements reflected in this Article 11 and agree not to commence any action, suit or proceeding related thereto except in such courts.

11.10 Patent and Trademark Disputes. Notwithstanding any other provisions of this Article 11, any dispute, controversy or claim relating to the scope, validity, enforceability or infringement of any Licensed Patents shall be submitted to a court of competent jurisdiction in the country in which such Patent was filed or granted.

ARTICLE 12
MISCELLANEOUS

12.1 Entire Agreement; Amendment. This Agreement, including the Exhibits hereto, and the Related Agreements sets forth the complete, final and exclusive agreement and all the covenants, promises, agreements, warranties, representations, conditions and understandings between the Parties hereto with respect to the subject matter hereof and supersedes, as of the Effective Date, all prior and contemporaneous agreements and understandings between the Parties with respect to the subject matter hereof. There are no covenants, promises, agreements, warranties, representations, conditions or understandings, either oral or written, between the Parties other than as are set forth in this Agreement or the Related Agreements. No subsequent alteration, amendment, change or addition to this Agreement shall be binding upon the Parties unless reduced to writing and signed by an authorized officer of each Party.

12.2 Rights in Bankruptcy.

(a) To the extent permitted under applicable Law, all rights and licenses granted under or pursuant to this Agreement by one Party to the other are, for all purposes of Title 11 of the United States Code ("**Title 11**"), licenses of rights to "intellectual property" as defined in Title 11, and, in the event that a case under Title 11 is commenced by or against either Party (the "**Bankrupt Party**"), the other Party shall have all of the rights set forth in Section 365(n) of Title 11 to the maximum extent permitted thereby. All rights of the Parties under this Section 12.2 and under Section 365(n) of Title 11 are in addition to and not in substitution of any and all other rights, powers, and remedies that each party may have under this Agreement, Title 11, and any other applicable Laws. The non-Bankrupt Party shall have the right to perform the obligations of the Bankrupt Party hereunder with respect to such intellectual property, but neither such provision nor such performance by the non-Bankrupt Party shall release the Bankrupt Party from any such obligation or liability for failing to perform it.

(b) Any intellectual property provided pursuant to the provisions of this Section 12.2 shall be subject to the licenses set forth elsewhere in this Agreement and the payment obligations of this Agreement, which shall be deemed to be royalties for purposes of Title 11.

12.3 Force Majeure. Both Parties shall be excused from the performance of their obligations under this Agreement to the extent that such performance is prevented by force majeure and the nonperforming Party promptly provides notice of the prevention to the other Party. Such

excuse shall be continued so long as the condition constituting force majeure continues and the nonperforming Party takes reasonable efforts to remove the condition. For purposes of this Agreement, force majeure shall include conditions beyond the control of the Parties, including an act of God, war, civil commotion, terrorist act, labor strike or lock-out, epidemic, failure or default of public utilities or common carriers, destruction of production facilities or materials by fire, earthquake, storm or like catastrophe, and failure of plant or machinery (provided that such failure could not have been prevented by the exercise of skill, diligence, and prudence that would be reasonably and ordinarily expected from a skilled and experienced person engaged in the same type of undertaking under the same or similar circumstances). Notwithstanding the foregoing, a Party shall not be excused from making payments owed hereunder because of a force majeure affecting such Party. If a force majeure persists for more than ninety (90) days, then the Parties will discuss in good faith the modification of the Parties' obligations under this Agreement in order to mitigate the delays caused by such force majeure.

12.4 Notices. Any notice required or permitted to be given under this Agreement shall be in writing, shall specifically refer to this Agreement, and shall be addressed to the appropriate Party at the address specified below or such other address as may be specified by such Party in writing in accordance with this Section 12.4, and shall be deemed to have been given for all purposes (a) when received, if hand-delivered or sent by confirmed facsimile or a reputable courier service, or (b) five (5) Business Days after mailing, if mailed by first class certified or registered airmail, postage prepaid, return receipt requested.

If to Precigen:

Precigen, Inc.
20374 Seneca Meadows Parkway
Germantown, MD 20876
Attn: Chief Legal Officer
Email: [*****]

If to Alaunos:

Alaunos Therapeutics
8030 El Rio
Houston, Texas 77054
Attn: General Counsel
Email: [*****]

12.5 No Strict Construction; Headings. This Agreement has been prepared jointly by the Parties and shall not be strictly construed against either Party. Ambiguities, if any, in this Agreement shall not be construed against any Party, irrespective of which Party may be deemed to have authored the ambiguous provision. The headings of each Article and Section in this Agreement have been inserted for convenience of reference only and are not intended to limit or expand on the meaning of the language contained in the particular Article or Section. Except where the context otherwise requires, the use of any gender shall be applicable to all genders, and the word "or" is used in the inclusive sense (and/or). The term "including" as used herein means including, without limiting the generality of any description preceding such term.

12.6 Assignment. Neither Party may assign or transfer this Agreement or any rights or obligations hereunder without the prior written consent of the other, which consent shall not be unreasonably withheld or delayed, except that a Party may make such an assignment or transfer without the other Party's consent (a) to its Affiliates, (b) to a Third Party in connection with the transfer or sale of all or substantially all of the business or assets of such Party to which this Agreement relates, whether by merger, consolidation, divesture, restructure, sale of stock, sale of assets or otherwise or (c) to a Third Party in connection with the transfer or sale of all or substantially all of the business or assets of such Party relating to a Licensed Product, whether by merger, consolidation, divesture, restructure, sale of stock, sale of assets or otherwise. Any successor or assignee of rights and/or obligations permitted hereunder shall, in writing to the other Party, expressly assume performance of such rights and/or obligations. Any permitted assignment shall be binding on the successors of the assigning Party. Any assignment or attempted assignment by either Party in violation of the terms of this Section 12.6 shall be null, void and of no legal effect.

12.7 Performance by Affiliates. Each Party may discharge any obligations and exercise any right hereunder through any of its Affiliates. Each Party hereby guarantees the performance by its Affiliates of such Party's obligations under this Agreement, and shall cause its Affiliates to comply with the provisions of this Agreement in connection with such performance. Any breach by a Party's Affiliate of any of such Party's obligations under this Agreement shall be deemed a breach by such Party, and the other Party may proceed directly against such Party without any obligation to first proceed against such Party's Affiliate.

12.8 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.

12.9 Severability. If any one or more of the provisions of this Agreement is held to be invalid or unenforceable by any court of competent jurisdiction from which no appeal can be or is taken, the provision shall be considered severed from this Agreement and shall not serve to invalidate any remaining provisions hereof. The Parties shall make a good faith effort to replace any invalid or unenforceable provision with a valid and enforceable one such that the objectives contemplated by the Parties when entering this Agreement may be realized.

12.10 No Waiver. Any delay in enforcing a Party's rights under this Agreement or any waiver as to a particular default or other matter shall not constitute a waiver of such Party's rights to the future enforcement of its rights under this Agreement, except with respect to an express written and signed waiver relating to a particular matter for a particular period of time.

12.11 Independent Contractors. Each Party shall act solely as an independent contractor, and nothing in this Agreement shall be construed to give either Party the power or authority to act for, bind, or commit the other Party in any way. Nothing herein shall be construed to create the relationship of partners, principal and agent, or joint-venture partners between the Parties.

12.12 Counterparts. This Agreement may be executed in one (1) or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

{Signature page follows}

IN WITNESS WHEREOF, the Parties have executed this Amended and Restated Exclusive License Agreement by their duly authorized officers as of the Effective Date.

ALAUNOS THERAPEUTICS	**PRECIGEN, INC.**
By: /s/ Melinda Lackey	By: /s/ Donald P. Lehr
Name: Melinda Lackey	Name: Donald P. Lehr
Title: Senior Vice President, Legal and Administrative	Title: Chief Legal Officer

LIST OF EXHIBITS:

Exhibit A: Licensed Patents
Exhibit B: Third Party Licenses

Exhibit A – Licensed Patents

- [*****]

Exhibit B - THIRD PARTY LICENSES

- License Agreement by and among Intrexon Corporation, Alaunos and MDACC with an effective date of January 13, 2015, as amended, and as assigned by Intrexon and assumed by Precigen effective as of January 1, 2018.

- License Agreement by and among Precigen, Alaunos and MDACC with an effective date of January 8, 2018, as amended.

Exhibit 31.1

CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Helen Sabzevari, certify that:

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

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

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

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

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

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

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

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

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

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

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

Date: August 9, 2023

/s/ HELEN SABZEVARI
Helen Sabzevari
Chief Executive Officer
(Principal Executive Officer)

Exhibit 31.2

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

I, Harry Thomasian Jr., certify that:

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

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

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

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

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

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

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

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

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

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

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

Date: August 9, 2023

/s/ HARRY THOMASIAN JR.
Harry Thomasian Jr.
Chief Financial Officer
(Principal Financial Officer)

Exhibit 32.1

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

I, Helen Sabzevari, Chief Executive Officer of Precigen, Inc. (the "Company"), do hereby certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to the best of my knowledge:

- the Quarterly Report on Form 10-Q of the Company for the quarter ended June 30, 2023 (the "Report") fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

- the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: August 9, 2023

/s/ HELEN SABZEVARI
Helen Sabzevari
Chief Executive Officer
(Principal Executive Officer)

A signed original of this written statement required by Section 906, or other document authenticating, acknowledging or otherwise adopting the signature that appears in typed form within the electronic version of this written statement required by Section 906, has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.

This certification accompanies the Form 10-Q to which it relates, is not deemed filed with the Securities and Exchange Commission and is not to be incorporated by reference into any filing of the Registrant under the Securities Act of 1933 or the Securities Exchange Act of 1934 (whether made before or after the date of the Form 10-Q), irrespective of any general incorporation language contained in such filing.

Exhibit 32.2

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

I, Harry Thomasian Jr., Chief Financial Officer of Precigen, Inc. (the "Company"), do hereby certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to the best of my knowledge:

- the Quarterly Report on Form 10-Q of the Company for the quarter ended June 30, 2023 (the "Report") fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

- the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: August 9, 2023

/s/ HARRY THOMASIAN JR.
Harry Thomasian Jr.
Chief Financial Officer
(Principal Financial Officer)

A signed original of this written statement required by Section 906, or other document authenticating, acknowledging or otherwise adopting the signature that appears in typed form within the electronic version of this written statement required by Section 906, has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.

This certification accompanies the Form 10-Q to which it relates, is not deemed filed with the Securities and Exchange Commission and is not to be incorporated by reference into any filing of the Registrant under the Securities Act of 1933 or the Securities Exchange Act of 1934 (whether made before or after the date of the Form 10-Q), irrespective of any general incorporation language contained in such filing.