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

FORM 10-Q

(Mark One)

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

For the quarterly period ended March 31, 2022

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: 001-34705

Codexis, Inc.

(Exact name of registrant as specified in its charter)

Delaware	**71-0872999**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**
200 Penobscot Drive, Redwood City, California	**94063**
(Address of principal executive offices)	**(Zip Code)**

Registrant's telephone number, including area code: (650) 421-8100

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

Title of Each Class	Trading Symbol(s)	Name of Each Exchange on Which Registered
Common Stock, par value $0.0001 per share	CDXS	The 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 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 May 4, 2022, there were 65,304,060 shares of the registrant's Common Stock, par value $0.0001 per share, outstanding.

Codexis, Inc.
Quarterly Report on Form 10-Q
For the Quarter Ended March 31, 2022

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PART I. FINANCIAL INFORMATION

Item 1. Financial Statements

Codexis, Inc.
Condensed Consolidated Balance Sheets
(Unaudited)
(In Thousands, Except Per Share Amounts)

	March 31, 2022	December 31, 2021
Assets		
Current assets:		
Cash and cash equivalents	$ 94,260	$ 116,797
Restricted cash, current	568	579
Financial assets:		
Accounts receivable	25,197	24,953
Contract assets	9,751	4,557
Unbilled receivables	9,584	8,558
Total financial assets	44,532	38,068
Less: allowances	(416)	(416)
Total financial assets, net	44,116	37,652
Inventories	1,560	1,160
Prepaid expenses and other current assets	4,365	5,700
Total current assets	144,869	161,888
Restricted cash	1,519	1,519
Investment in non-marketable equity securities ($12,713 and $12,713 with a related party)	19,002	14,002
Right-of-use assets - Operating leases, net	42,912	44,095
Right-of-use assets - Finance leases, net	—	17
Property and equipment, net	23,474	21,345
Goodwill	3,241	3,241
Other non-current assets	257	276
Total assets	$ 235,274	$ 246,383
Liabilities and Stockholders' Equity		
Current liabilities:		
Accounts payable	$ 1,949	$ 2,995
Accrued compensation	6,843	11,119
Other accrued liabilities	14,172	12,578
Current portion of lease obligations - Operating leases	4,927	4,093
Deferred revenue ($0 and $245 to a related party)	1,604	2,586
Total current liabilities	29,495	33,371
Deferred revenue, net of current portion	3,464	3,749
Long-term lease obligations - Operating leases	42,354	43,561
Other long-term liabilities	1,326	1,311
Total liabilities	76,639	81,992
Commitments and Contingencies (Note 10)		
Stockholders' equity:		
Preferred stock, $0.0001 par value per share; 5,000 shares authorized, none issued and outstanding	—	—
Common stock, $0.0001 par value per share; 100,000 shares authorized; 65,304 shares and 65,109 shares issued and outstanding as of March 31, 2022 and December 31, 2021, respectively	6	6
Additional paid-in capital	554,683	552,083
Accumulated deficit	(396,054)	(387,698)
Total stockholders' equity	158,635	164,391
Total liabilities and stockholders' equity	$ 235,274	$ 246,383

See accompanying notes to the unaudited condensed consolidated financial statements.

Codexis, Inc.
Condensed Consolidated Statements of Operations
(Unaudited)
(In Thousands, Except Per Share Amounts)

	Three Months Ended March 31,	
	2022	**2021**
Revenues:		
Product revenue	$ 30,690	$ 10,226
Research and development revenue ($245 and $132 from a related party)	4,650	7,806
Total revenues	35,340	18,032
Costs and operating expenses:		
Cost of product revenue	8,521	4,218
Research and development	19,500	11,571
Selling, general and administrative	15,705	11,398
Total costs and operating expenses	43,726	27,187
Loss from operations	(8,386)	(9,155)
Interest income	42	177
Other expense, net	(3)	(88)
Loss before income taxes	(8,347)	(9,066)
Provision for income taxes	9	2
Net loss	$ (8,356)	$ (9,068)
Net loss per share, basic and diluted	$ (0.13)	$ (0.14)
Weighted average common stock shares used in computing net loss per share, basic and diluted	65,096	64,290

See accompanying notes to the unaudited condensed consolidated financial statements.

Codexis, Inc.
Condensed Consolidated Statements of Stockholders' Equity
(Unaudited)
(In Thousands)

Three Months Ended March 31, 2022	Common Stock Shares	Common Stock Amount	Additional Paid-in Capital	Accumulated Deficit	Total Stockholders' Equity
Balance as of January 1, 2022	65,109	$ 6	$ 552,083	$ (387,698)	$ 164,391
Exercise of stock options	78	—	181	—	181
Release of stock awards	190	—	—	—	—
Employee stock-based compensation	—	—	3,777	—	3,777
Non-employee stock-based compensation	—	—	61	—	61
Taxes paid related to net share settlement of equity awards	(73)	—	(1,419)	—	(1,419)
Net loss	—	—	—	(8,356)	(8,356)
Balance as of March 31, 2022	65,304	$ 6	$ 554,683	$ (396,054)	$ 158,635

Three Months Ended March 31, 2021	Common Stock Shares	Common Stock Amount	Additional Paid-in Capital	Accumulated Deficit	Total Stockholders' Equity
Balance as of January 1, 2021	64,283	$ 6	$ 536,516	$ (366,419)	$ 170,103
Exercise of stock options	118	—	1,223	—	1,223
Release of stock awards	139	—	—	—	—
Employee stock-based compensation	—	—	2,626	—	2,626
Non-employee stock-based compensation	—	—	61	—	61
Taxes paid related to net share settlement of equity awards	(52)	—	(1,206)	—	(1,206)
Net loss	—	—	—	(9,068)	(9,068)
Balance as of March 31, 2021	64,488	$ 6	$ 539,220	$ (375,487)	$ 163,739

See accompanying notes to the unaudited condensed consolidated financial statements.

Codexis, Inc.
Condensed Consolidated Statements of Cash Flows
(Unaudited)
(In Thousands)

	Three Months Ended March 31,	
	2022	**2021**
Operating activities:		
Net loss	$ (8,356)	$ (9,068)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation	1,215	659
Amortization expense - right-of-use assets - operating and finance leases	1,200	649
Stock-based compensation	3,838	2,687
Equity securities earned from research and development activities from a related party	(245)	(132)
Other non-cash items	(7)	(84)
Changes in operating assets and liabilities:		
Financial assets, net	(6,463)	1,103
Inventories	(400)	(65)
Prepaid expenses and other assets	1,397	70
Accounts payable	(1,029)	400
Accrued compensation and other accrued liabilities	(121)	(1,731)
Other long-term liabilities	(1,192)	(617)
Deferred revenue	(1,023)	(311)
Net cash used in operating activities	(11,186)	(6,440)
Investing activities:		
Purchase of property and equipment	(5,089)	(2,550)
Proceeds from sale of property and equipment	7	17
Investment in non-marketable securities	(5,000)	—
Net cash used in investing activities	(10,082)	(2,533)
Financing activities:		
Proceeds from exercises of stock options	181	1,223
Costs incurred in connection with equity financing	(42)	—
Taxes paid related to net share settlement of equity awards	(1,419)	(1,206)
Net cash provided by (used in) financing activities	(1,280)	17
Net decrease in cash, cash equivalents and restricted cash	(22,548)	(8,956)
Cash, cash equivalents and restricted cash at the beginning of the period	118,895	150,817
Cash, cash equivalents and restricted cash at the end of the period	$ 96,347	$ 141,861
Supplemental disclosure of cash flow information:		
Interest paid	$ 5	$ 3
Supplemental non-cash investing and financing activities:		
Capital expenditures incurred but not yet paid	$ 789	$ 579

The following table provides a reconciliation of cash, cash equivalents and restricted cash reported within the unaudited condensed consolidated balance sheets as of March 31, 2022 and 2021 to the total of the same such amounts shown above in the unaudited condensed consolidated statements of cash flows:

	March 31,	
	2022	**2021**
Cash and cash equivalents	$ 94,260	$ 139,748
Restricted cash, current and non-current	2,087	2,113
Total cash, cash equivalents and restricted cash	$ 96,347	$ 141,861

See accompanying notes to the unaudited condensed consolidated financial statements.

Note 1. Description of Business

In these notes to the unaudited condensed consolidated financial statements, the "Company," "we," "us," and "our" refers to Codexis, Inc. and its subsidiaries on a consolidated basis.

We discover, develop and sell enzymes and other proteins that deliver value to our clients in a growing set of industries to commercialize an increasing number of novel enzymes, both as proprietary Codexis products and in partnership with our customers.

We report our financial results based on two reportable segments: Performance Enzymes and Novel Biotherapeutics. The segment information aligns with how the chief operating decision maker (CODM), who is our Chief Executive Officer (CEO), reviews and manages the business.

Business Update Regarding COVID-19

We are subject to risks and uncertainties as a result of the current COVID-19 pandemic. The COVID-19 pandemic has presented a substantial public health and economic challenge around the world and is affecting our employees, communities and business operations, as well as the U.S. economy and other economies worldwide. The full extent to which the COVID-19 pandemic will directly or indirectly impact our business, results of operations and financial condition will depend on future developments that are highly uncertain and may not be accurately predicted, including the duration and severity of the pandemic, the prevalence of more contagious and or virulent variants such as the Delta and Omicron variants, and the extent and severity of the impact on our customers, new information that may emerge concerning COVID-19, the actions taken to contain it or treat its impact and the economic impact on local, regional, national and international markets.

To date, we and our collaboration partners have been able to continue to supply our enzymes to our customers worldwide. However, we are dependent on our manufacturing and logistics partners and consequently, disruptions in operations of our partners and customers may affect our ability to supply enzymes to our customers. Furthermore, our ability to provide future R&D services may continue to be impacted as a result of governmental orders ("Orders") and any disruptions in operations of our customers with whom we collaborate. We believe that these disruptions have had a minimal impact on revenue for the three months ended March 31, 2022. The extent to which the pandemic may impact our business operations and operating results will continue to remain highly dependent on future developments, which are uncertain and cannot be predicted with confidence.

Note 2. Basis of Presentation and Summary of Significant Accounting Policies

Basis of Presentation and Principles of Consolidation

The accompanying unaudited condensed consolidated financial statements have been prepared in accordance with generally accepted accounting principles in the United States of America ("GAAP") and the applicable rules and regulations of the Securities and Exchange Commission ("SEC") for interim financial information but does not include all the information and notes required by GAAP for complete financial statements. These interim unaudited condensed consolidated financial statements should be read in conjunction with the audited consolidated financial statements and notes thereto contained in our Annual Report on Form 10-K for the year ended December 31, 2021. The condensed consolidated balance sheet at December 31, 2021 has been derived from the audited consolidated financial statements at that date, but does not include all disclosures, including notes, required by GAAP for complete financial statements. The significant accounting policies used in preparation of the unaudited condensed consolidated financial statements for the three months ended March 31, 2022 and 2021, are consistent with those discussed in Note 2 to the audited consolidated financial statements in the Company's 2021 Annual Report on Form 10-K and are updated below as necessary. There have been no significant changes in our significant accounting policies or critical accounting estimates since December 31, 2021.

The unaudited condensed consolidated financial statements have been prepared on the same basis as the audited consolidated financial statements and, in the opinion of management, reflect all adjustments of a normal recurring nature considered necessary to present fairly our financial position as of March 31, 2022, results of our operations for the three months ended March 31, 2022 and 2021, changes in stockholders' equity for the three months ended March 31, 2022 and 2021, and cash flows for the three months ended March 31, 2022 and 2021. The interim results are not necessarily indicative of the results for any future interim period or for the entire year.

The unaudited condensed consolidated financial statements include the accounts of Codexis, Inc. and its wholly owned subsidiaries. All intercompany balances and transactions have been eliminated in consolidation.

Use of Estimates

The preparation of our unaudited condensed consolidated financial statements in conformity with GAAP requires us to make estimates, judgments and assumptions that may affect the reported amounts of assets, liabilities, equity, revenues and expenses and related disclosure of contingent assets and liabilities. We regularly assess these estimates which primarily affect revenue recognition, inventories, valuation of equity investments, goodwill arising out of business acquisitions, accrued liabilities, stock awards, and the valuation allowances associated with deferred tax assets. Actual results could differ from those estimates and such differences may be material to the consolidated financial statements. The full extent to which the COVID-19 pandemic will directly or indirectly impact our business, results of operations and financial condition, including sales, expenses, reserves and allowances, manufacturing, research and development costs and employee-related amounts, will depend on future developments that are highly uncertain, and may not be accurately predicted, including as a result of new information that may emerge concerning COVID-19 and the actions taken to contain or treat COVID-19, as well as the economic impact on local, regional, national and international customers, markets and economies.

Accounting Pronouncements

Recently adopted accounting pronouncements

In May 2021, FASB issued ASU No. 2021-04,*Earnings Per Share (Topic 260), Debt—Modifications and Extinguishments (Subtopic 470-50), Compensation—Stock Compensation (Topic 718), and Derivatives and Hedging—Contracts in Entity's Own Equity (Subtopic 815-40), Issuer's Accounting for Certain Modifications or Exchanges of Freestanding Equity-Classified Written Call Options, a consensus of the Emerging Issues Task Force*. The standard establishes a principles-based framework in accounting for modifications of freestanding equity-classified written call options on the basis of the economic substance of the underlying transaction. The standard also requires incremental financial statement disclosures. The standard affects entities that present earnings per share in accordance with the guidance in Topic 260, Earnings Per Share. We adopted the standard on January 1, 2022 on a prospective basis. The adoption of this standard had no impact on our Unaudited Condensed Consolidated Financial Statements and related disclosures.

In August 2020, FASB issued ASU No 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) No. 2020-06 August 2020 Accounting for Convertible Instruments and Contracts in an Entity's Own Equity*, to reduce the complexity and to simplify the accounting for convertible debt instruments and convertible preferred stock, and the derivatives scope exception for contracts in an entity's own equity. In addition, the guidance on calculating diluted earnings per share has been simplified and made more internally consistent. We adopted the standard on January 1, 2022 on a modified retrospective basis. The adoption of this standard had no impact on our Unaudited Condensed Consolidated Financial Statements and related disclosures.

In March 2020, the FASB issued ASU 2020-04, Reference Rate Reform (Topic 848*): Facilitation of the Effects of Reference Rate Reform on Financial Reporting.* The standard provides optional expedients and exceptions for applying GAAP to contracts, hedging relationships, and other transactions in which the reference LIBOR or another reference rate are expected to be discontinued as a result of the Reference Rate Reform. We adopted the standard on January 1, 2022 on a prospective basis. The adoption of this standard had no significant impact on our Unaudited Condensed Consolidated Financial Statements and related disclosures.

Recently issued accounting pronouncements not yet adopted

There have been no other recent accounting pronouncements or changes in accounting pronouncements during the three months ended March 31, 2022 that are of significance or potential significance to us.

Note 3. Revenue Recognition

Disaggregation of Revenue

The following table provides information about disaggregated revenue from contracts with customers into the nature of the products and services, and geographic regions, and includes a reconciliation of the disaggregated revenue with reportable segments. The geographic regions that are tracked are the Americas (United States, Canada, and Latin America), EMEA (Europe, Middle East, and Africa), and APAC (Australia, New Zealand, Southeast Asia, and China).

Segment information is as follows (in thousands):

	Three Months Ended March 31, 2022			Three Months Ended March 31, 2021		
	Performance Enzymes	Novel Biotherapeutics	Total	Performance Enzymes	Novel Biotherapeutics	Total
Major products and service:						
Product revenue	$ 30,690	$ —	$ 30,690	$ 10,226	$ —	$ 10,226
Research and development revenue	2,409	2,241	4,650	4,003	3,803	7,806
Total revenues	$ 33,099	$ 2,241	$ 35,340	$ 14,229	$ 3,803	$ 18,032
Primary geographical markets:						
Americas	$ 2,553	$ 1,179	$ 3,732	$ 2,871	$ 2,058	$ 4,929
EMEA	3,065	1,062	4,127	4,537	1,745	6,282
APAC	27,481	—	27,481	6,821	—	6,821
Total revenues	$ 33,099	$ 2,241	$ 35,340	$ 14,229	$ 3,803	$ 18,032

Contract Balances

The following table presents balances of contract assets, unbilled receivables, contract costs, and contract liabilities (in thousands):

	March 31, 2022	December 31, 2021
Contract assets	$ 9,751	$ 4,557
Unbilled receivables	$ 9,584	$ 8,558
Contract costs	$ 46	$ 56
Contract liabilities: deferred revenue	$ 5,068	$ 6,335

We had no asset impairment charges related to financial assets in the three months ended March 31, 2022 and 2021.

The increase in contract assets was primarily due to increases in product revenue from contracts subject to over time revenue recognition. The increase in unbilled receivables was primarily due to the timing of billings. The decrease in deferred revenue was primarily due to timing of recognition of revenue.

We recognized the following revenues (in thousands):

	Three Months Ended March 31,	
Revenue recognized in the period for:	2022	2021
Amounts included in contract liabilities at the beginning of the period:		
Performance obligations satisfied	$ 1,094	$ 862
Changes in the period:		
Changes in the estimated transaction price allocated to performance obligations satisfied in prior periods	215	24
Performance obligations satisfied from new activities in the period - contract revenue	34,031	17,146
Total revenues	$ 35,340	$ 18,032

Performance Obligations

The following table includes estimated revenue expected to be recognized in the future related to performance obligations that are unsatisfied or partially unsatisfied at the end of the reporting periods. The estimated revenue does not include contracts with original durations of one year or less, amounts of variable consideration attributable to royalties, or contract renewals that are unexercised as of March 31, 2022.

The balances in the table below are partially based on judgments involved in estimating future orders from customers subject to the exercise of material rights pursuant to respective contracts as of March 31, 2022 (in thousands):

	Remainder of 2022	2023	2024	2025 and Thereafter	Total
Product revenue	$ 60	$ 67	$ 100	$ 2,740	$ 2,967
Research and development revenue	1,254	847	—	—	2,101
Total revenues	$ 1,314	$ 914	$ 100	$ 2,740	$ 5,068

Note 4. Net Loss per Share

Basic net loss per share is computed by dividing the net loss by the weighted-average number of shares of common stock outstanding, less restricted stock awards ("RSAs") subject to forfeiture. Diluted net loss per share is computed by dividing net loss by the weighted-average number of shares of common stock shares outstanding, less RSAs subject to forfeiture, plus all additional common shares that would have been outstanding, assuming dilutive potential common stock shares had been issued for other dilutive securities. For all periods presented, net loss per share, basic and diluted, are identical since potential common stock shares are excluded from the calculation, as their effect was anti-dilutive.

Anti-Dilutive Securities

In periods of net loss, the weighted average number of shares outstanding, prior to the application of the treasury stock method, excludes potentially dilutive securities from the computation of diluted net loss per common share because including such shares would have an anti-dilutive effect.

The following shares were not considered in the computation of diluted net loss per share because their effect was anti-dilutive (in thousands):

	Three Months Ended March 31,	
	2022	2021
Shares issuable under the Equity Incentive Plan	5,899	5,497

Note 5. Investments in Non-Marketable Securities

Non-Marketable Debt Securities

We classify non-marketable debt securities, which are accounted for as available-for-sale, within Level 3 in the fair value hierarchy because we estimate the fair value based on a qualitative analysis using the most recent observable transaction price and other significant unobservable inputs including volatility, rights, and obligations of the securities we hold.

We determine gains or losses on the sale or extinguishment of non-marketable debt securities using a specific identification method. Unrealized gains and losses from bifurcated embedded derivatives, which represent share-settled redemption features, are recorded as other expense, net, in the unaudited condensed consolidated statements of operations. Unrealized gains and losses on non-marketable debt securities are recorded as a component of other comprehensive loss until realized. Realized gains or losses are recorded as a component of other income (expense), net.

In November 2020, we purchased convertible subordinated notes issued by Arzeda Corp. ("Arzeda"), an early-stage computational protein design company, for $1.0 million and the investment was classified as available-for-sale non-marketable interest-bearing debt securities. In July 2021, we converted the non-marketable debt security with a carrying value of $1.3 million into 207,070 shares of Series B-2 preferred stock of Arzeda Corp. During the three months ended March 31, 2021 we recognized $0.1 million in interest income from interest earned on our investment in this debt security.

There were no investments in non-marketable debt securities as of March 31, 2022 and December 31, 2021.

Non-Marketable Equity Securities

In March 2022, we entered into a Stock Purchase Agreement with seqWell, Inc. ("seqWell"), a privately held biotechnology company, pursuant to which we purchased 1,000,000 shares of seqWell's Series C preferred stock for $5.0 million.

Our non-marketable equity securities are investments in privately held companies without readily determinable market value and primarily relate to our investments in Molecular Assemblies, Inc. ("MAI"), Arzeda and seqWell. These investments are accounted for under the measurement alternative and are measured at cost minus impairment, if any, plus or minus changes resulting from observable price changes for identical or similar securities of the same issuer. Non-marketable equity securities are measured at fair value on a non-recurring basis and classified within Level 2 in the fair value hierarchy because we estimate the fair value of these investments using the observable transaction price paid by third party investors for the same or similar security of the same issuers. We adjust the carrying value of non-marketable equity securities which have been remeasured during the period and recognize resulting gains or losses as a component of other income (expense), net in the unaudited condensed consolidated statements of operations.

There was no remeasurement event for our investments in MAI, Arzeda and seqWell that occurred during the three months ended March 31, 2022 and 2021. We recognized no realized gains or losses during the three months ended March 31, 2022 and 2021.

The following table presents the carrying value of our non-marketable equity securities (in thousands):

	March 31, 2022	December 31, 2021
MAI	$ 12,713	$ 12,713
seqWell	5,000	—
Arzeda	1,289	1,289
Total non-marketable equity securities	$ 19,002	$ 14,002

Note 6. Fair Value Measurements

The following tables present the financial instruments that were measured at fair value on a recurring basis at March 31, 2022 and December 31, 2021 by level within the fair value hierarchy (in thousands):

	March 31, 2022			
	Level 1	Level 2	Level 3	Total
Money market funds	$ 72,107	$ —	$ —	$ 72,107

	December 31, 2021			
	Level 1	Level 2	Level 3	Total
Money market funds	$ 86,095	$ —	$ —	$ 86,095

During the three months ended March 31, 2022 and 2021,we did not recognize any significant credit losses nor other-than-temporary impairment losses on non-marketable securities.

Note 7. Balance Sheets Details

Cash Equivalents

Cash equivalents as of March 31, 2022 and December 31, 2021, consisted of the following (in thousands):

	March 31, 2022		December 31, 2021	
	Adjusted Cost	Estimated Fair Value	Adjusted Cost	Estimated Fair Value
Money market funds [(1)]	$ 72,107	$ 72,107	$ 86,095	$ 86,095

[(1)] Money market funds are classified in cash and cash equivalents on our unaudited condensed consolidated balance sheets. Average contractual maturities (in days) is not applicable.

As of March 31, 2022, the total cash and cash equivalents balance of $94.3 million consisted of money market funds of $72.1 million and cash of $22.2 million held with major financial institutions. As of December 31, 2021, the total cash and cash equivalents balance of $116.8 million consisted of money market funds of $86.1 million and cash of $30.7 million held with major financial institutions.

Inventories

Inventories consisted of the following (in thousands):

	March 31, 2022	December 31, 2021
Raw materials	$ 49	$ 49
Work-in-process	160	65
Finished goods	1,351	1,046
Inventories	$ 1,560	$ 1,160

Inventories are recorded net of reserves of $1.4 million as of March 31, 2022 and December 31, 2021.

Property and Equipment, net

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

	March 31, 2022	December 31, 2021
Laboratory equipment	$ 36,435	$ 33,101
Leasehold improvements	16,506	16,117
Computer equipment and software	3,565	3,481
Office equipment and furniture	1,297	1,297
Construction in progress	2,450	3,231
Property and equipment	60,253	57,227
Less: accumulated depreciation and amortization	(36,779)	(35,882)
Property and equipment, net	$ 23,474	$ 21,345

Depreciation expense included in both research and development expenses and selling, general and administrative expenses in the unaudited condensed consolidated statements of operations was as follows (in thousands):

	Three Months Ended March 31,	
	2022	2021
Depreciation expense	$ 1,215	$ 659

Goodwill

Goodwill had a carrying value of $3.2 million as of March 31, 2022 and December 31, 2021.

Other Accrued Liabilities

Other accrued liabilities consisted of the following (in thousands):

	March 31, 2022	December 31, 2021
Accrued purchases	$ 7,695	$ 6,755
Accrued professional and outside service fees	6,121	5,147
Other	356	676
Total	$ 14,172	$ 12,578

Note 8. Stock-based Compensation

Equity Incentive Plans

In 2019, our board of directors (the "Board") and stockholders approved the 2019 Incentive Award Plan (the "2019 Plan"). The 2019 Plan superseded and replaced in its entirety our 2010 Equity Incentive Plan (the “2010 Plan”) which was effective in March 2010, and no further awards will be granted under the 2010 Plan; however, the terms and conditions of the 2010 Plan will continue to govern any outstanding awards thereunder.

The 2019 Plan provides for the grant of stock options, including incentive stock options and non-qualified stock options, stock appreciation rights, restricted stock awards ("RSAs"), restricted stock units ("RSUs"), performance-contingent restricted stock units ("PSUs"), performance based options ("PBOs"), other stock or cash based awards and dividend equivalents to eligible employees and consultants of the Company or any parent or subsidiary, as well as members of the Board.

The number of shares of our common stock available for issuance under the 2019 Plan is equal to the sum of (i) 7,897,144 shares, and (ii) any shares subject to awards granted under the 2010 Plan that were outstanding as of April 22, 2019 and thereafter terminate, expire, lapse or are forfeited; provided that no more than 14,000,000 shares may be issued upon the exercise of incentive stock options ("ISOs"). In June 2019, 8.1 million shares authorized for issuance under the 2019 Plan were registered under the Securities Act of 1933, as amended (the "Securities Act").

The 2010 Plan provided for the grant of incentive stock options, non-statutory stock options, RSUs, RSAs, PSUs, PBOs, stock appreciation rights, and stock purchase rights to our employees, non-employee directors and consultants.

Stock Options

The option exercise price for incentive stock options must be at least 100% of the fair value of our common stock on the date of grant and the option exercise price for non-statutory stock options is at least 85% of the fair value of our common stock on the date of grant, as determined by the Board. If, at the time of a grant, the optionee directly or by attribution owns stock possessing more than 10% of the total combined voting power of all of our outstanding capital stock, the exercise price for these options must be at least 110% of the fair value of the underlying common stock. Stock options granted to employees generally have a maximum term often years and vest over four years from the date of grant, of which 25% vest at the end of one year, and 75% vest monthly over the remaining three years. We may grant options with different vesting terms from time to time. Unless an employee's termination of service is due to disability or death, upon termination of service, any unexercised vested options will be forfeited at the end of three months or the expiration of the option, whichever is earlier.

Restricted Stock Units ("RSUs")

We also grant employees RSUs, which generally vest over either a three year period with 33% of the shares subject to the RSUs vesting on each yearly anniversary of the vesting commencement date or over a four year period with 25% of the shares subject to the RSU vesting on each yearly anniversary of the vesting commencement date, in each case contingent upon such employee's continued service on such vesting date. RSUs are generally subject to forfeiture if employment terminates prior to the release of vesting restrictions. We may grant RSUs with different vesting terms from time to time.

Performance-contingent Restricted Stock Units ("PSUs") and Performance Based Options ("PBOs")

The compensation committee of the Board approved, solely in respect of non-executive employees, delegated to our Chief Executive Officer the authority to approve grants of PSUs. The compensation committee of the Board also approved grants of PBOs and PSUs to our executives. The PSUs and PBOs vest based upon both the successful achievement of certain corporate operating milestones in specified timelines and continued employment through the applicable vesting date. When the performance goals are deemed to be probable of achievement for these types of awards, recognition of stock-based compensation expense commences. Once the number of shares eligible to vest is determined, those shares vest in two equal installments with 50% vesting upon achievement and the remaining 50% vesting on the first anniversary of achievement, in each case, subject to the recipient's continued service through the applicable vesting date. If the performance goals are achieved at the threshold level, the number of shares eligible to vest in respect of the PSUs and PBOs would be equal to half the number of PSUs granted and one-quarter the number of shares underlying the PBOs granted. If the performance goals are achieved at the target level, the number of shares eligible to vest in respect of the PSUs and PBOs would be equal to the number of PSUs granted and half of the shares underlying the PBOs granted. If the performance goals are achieved at the superior level, the number of shares eligible to vest in respect of the PSUs would be equal to two times the number of PSUs granted and equal to the number of PBOs granted. The number of shares issuable upon achievement of the performance goals at the levels between the threshold and target levels for the PSUs and PBOs or between the target level and superior levels for the PSUs would be determined using linear interpolation. Achievement below the threshold level would result in no shares being eligible to vest in respect of the PSUs and PBOs.

In the first quarter of 2022, we awarded PSUs ("2022 PSUs") and PBOs ("2022 PBOs"), each of which commence vesting based upon the achievement of various weighted performance goals, including total revenues, research and development revenue, product revenue excluding sales of CDX-616 to Pfizer for use in the manufacture of a critical intermediate for its proprietary active pharmaceutical ingredient, nirmatrelvir, which Pfizer markets, sells and distributes, in combination with the active pharmaceutical ingredient ritonavir, as its PAXLOVID™ product, operating expenses excluding cost of product revenue, strategic performance enzyme deliverables, strategic biotherapeutics deliverables, organization and infrastructure upgrades, corporate developments, and significant events that can be publicly announced. As of March 31, 2022, we estimated that the 2022 PSUs and 2022 PBOs performance goals would be achieved at 100% and 50% of the target level, respectively, and recognized stock-based compensation expenses accordingly.

In 2021, we awarded PSUs ("2021 PSUs") and PBOs ("2021 PBOs"), each of which commence vesting based upon the achievement of various weighted performance goals, including total revenues, product revenue, performance enzymes pipeline advancements, biotherapeutics pipeline advancements, organization and infrastructure upgrades, and significant events that can be publicly announced. In the first quarter of 2022, we determined that the 2021 PSUs and 2021 PBOs performance goals had been achieved at 146% and 73% of the target level, respectively, and recognized stock-based compensation expenses accordingly. Accordingly, 50% of the shares underlying the 2021 PSUs and PBOs vested in the first quarter of 2022 and 50% of the shares underlying the 2021 PSUs and PBOs will vest in the first quarter of 2023, in each case subject to the recipient's continued service on each vesting date.

In 2020, we awarded PSUs ("2020 PSUs") and PBOs ("2020 PBOs"), each of which commenced vesting based upon the achievement of various weighted performance goals, including total revenues, performance enzyme segment gross margin, major new biotherapeutics publicity events, strategic performance enzyme and biotherapeutics deliverables, and strategic plan development. In the first quarter of 2021, we determined that the 2020 PSUs and 2020 PBOs performance goals had been achieved at 88% and 44% of the target level, respectively, and recognized stock-based compensation expenses accordingly. Accordingly, 50% of the shares underlying the 2020 PSUs and PBOs vested in the first quarter of 2021 and 50% of the shares underlying the 2020 PSUs and PBOs vested in the first quarter of 2022, in each case subject to the recipient's continued service on each vesting date.

Stock-Based Compensation Expense

Stock-based compensation expense is included in the unaudited condensed consolidated statements of operations as follows (in thousands):

	Three Months Ended March 31,	
	2022	**2021**
Research and development	$ 936	$ 477
Selling, general and administrative	2,902	2,210
Total	$ 3,838	$ 2,687

The following table presents total stock-based compensation expense by security type included in the unaudited condensed consolidated statements of operations (in thousands):

	Three Months Ended March 31,	
	2022	**2021**
Stock options	$ 806	$ 665
RSUs and RSAs	1,162	542
PSUs	872	470
PBOs	998	1,010
Total	$ 3,838	$ 2,687

As of March 31, 2022, unrecognized stock-based compensation expense, net of expected forfeitures, was $6.6 million related to unvested stock options, $9.2 million related to unvested RSUs and RSAs, $2.5 million related to unvested PSUs, and $4.5 million related to unvested PBOs based on current estimates of the level of achievement. Stock-based compensation expense for these awards will be recognized through the year 2026.

Note 9. Capital Stock

Exercise of Options

For the three months ended March 31, 2022 and March 31, 2021, we issued 77,600 and 118,437 shares, respectively, upon option exercises at a weighted-average exercise price of $2.33 and $10.33 per share, respectively, with net cash proceeds of $0.2 million and $1.2 million, respectively.

Equity Distribution Agreement

We filed a Registration Statement on Form S-3 with the SEC, under which we may sell common stock, preferred stock, debt securities, warrants, purchase contracts, and units from time to time in one or more offerings. The registration statement became effective on May 7, 2021. In May 2021, we entered into an Equity Distribution Agreement ("EDA") with Piper Sandler & Co ("PSC"), under which PSC, as our exclusive agent, at our discretion and at such times that we may determine from time to time, may sell over a three-year period from the execution of the EDA up to a maximum of $50.0 million of shares of our common stock. Under the terms of the EDA, PSC may sell the shares at market prices by any method that is deemed to be an "at the market offering" as defined in Rule 415 under the Securities Act of 1933, as amended.

We are not required to sell any shares at any time during the term of the EDA. The EDA will terminate upon the earlier of: (i) the issuance and sale of all shares through PSC on the terms and conditions of the EDA, or (ii) the termination of the EDA in accordance with its terms. Either party may terminate the EDA at any time upon written notification to the other party in accordance with the EDA, and upon such notification, the offering will terminate. Under no circumstances shall any shares be sold pursuant to the EDA after the date which is three years after the registration statement is first declared effective by the SEC. We agreed to pay PSC a commission of 3% of the gross sales price of any shares sold pursuant to the EDA. With the exception of certain expenses, we will pay PSC up to 8% of the gross sales price of the shares sold pursuant to the EDA for a combined amount of commission and reimbursement of PSC's expenses and fees.

During the three months ended March 31, 2022, no shares of our common stock were issued pursuant to the EDA. As of March 31, 2022, $50.0 million worth of shares remained available for sale under the EDA.

Note 10. Commitments and Contingencies

Operating Leases

Our headquarters are located in Redwood City, California, where we occupy approximately 77,300 square feet of office and laboratory space in multiple buildings within the same business park of Metropolitan Life Insurance Company ("MetLife"). Our lease agreement with MetLife ("RWC Lease") includes approximately 28,200 square feet of space located at 200 and 220 Penobscot Drive, Redwood City, California (the "200/220 Penobscot Space") and approximately 37,900 square feet of space located at 400 Penobscot Drive, Redwood City, California (the "400 Penobscot Space") (the 200/220 Penobscot Space and the 400 Penobscot Space are collectively referred to as the "Penobscot Space"), and approximately 11,200 square feet of space located at 501 Chesapeake Drive, Redwood City, California (the "501 Chesapeake Space").

We entered into the initial lease with MetLife for our facilities in Redwood City in 2004 and the RWC Lease has been amended multiple times since then to adjust the leased space and terms of the Lease. In February 2019, we entered into an Eighth Amendment to the Lease (the "Eighth Amendment") with MetLife with respect to the Penobscot Space and the 501 Chesapeake Space to extend the term of the Lease for additional periods. Pursuant to the Eighth Amendment, the term of the lease of the Penobscot Space has been extended through May 2027. The lease term for the 501 Chesapeake Space has been extended to May 2029. We have one (1) option to extend the term of the lease for the Penobscot Space for five (5) years, and one (1) separate option to extend the term of the lease for the 501 Chesapeake Space for five (5) years.

Pursuant to the terms of the RWC Lease, we exercised our right to deliver a letter of credit in lieu of a security deposit. The letter of credit is collateralized by deposit balances held by the bank in the amount of $1.1 million as of March 31, 2022 and December 31, 2021, and are recorded as non-current restricted cash on the unaudited condensed consolidated balance sheets.

In January 2021, we entered into a lease agreement with ARE-San Francisco No. 63, LLC ("ARE") to lease a portion of a facility comprising approximately 36,593 rentable square feet in San Carlos, California to serve as additional office and research and development laboratory space (the "San Carlos Space"). The terms include an initial annualized base rent of $2.5 million, subject to scheduled 3% annual rent increases, an annualized additional allowance payment of $0.4 million, plus certain operating expenses. The lease has a 10-year term from the lease commencement date of November 30, 2021 with one option to extend the term for an additional period of 5 years. We have provided ARE with a $0.5 million security deposit in the form of a letter of credit and we commenced occupancy of the San Carlos Space in December 2021. We have the right to sublease the facility, subject to landlord consent.

We entered into a short-term office lease in San Carlos, California during the second quarter of 2021 and this lease expired in April 2022. Our remaining future commitment pursuant to this lease is nominal as of March 31, 2022.

We are required to restore certain areas of the Redwood City and San Carlos facilities that we are renting to their original form. We are expensing the asset retirement obligation over the terms of the respective leases. We review the estimated obligation each reporting period and make adjustments if our estimates change. We recorded asset retirement obligations of $0.5 million and $0.4 million as of March 31, 2022 and December 31, 2021, respectively, which are included in other liabilities on the unaudited condensed consolidated balance sheets. Accretion expense related to our asset retirement obligations was nominal in the three months ended March 31, 2022 and 2021.

Lease and other information

Lease costs, amounts included in measurement of lease obligations and other information related to non-cancellable operating leases and finance leases were as follows (in thousands):

	Three Months Ended March 31,	
	2022	**2021**
Finance lease costs	18	26
Operating lease cost	1,831	1,032
Short-term lease costs [1]	30	—
Total lease cost [2]	$ 1,879	$ 1,058

[1] Short-term lease costs on leases with terms of over one month and less than one year.
[2] The Company had no variable lease costs.

Other information:	**Operating Leases**
Weighted-average remaining lease term (in years)	7.7 years
Weighted-average discount rate	5.5 %

	Three Months Ended March 31,	
Cash paid:	**2022**	**2021**
Operating cash flows from operating leases	$ 1,022	$ 1,042

As of March 31, 2022, our maturity analysis of annual undiscounted cash flows of the non-cancellable operating leases are as follows (in thousands):

Years Ending December 31,	**Operating Leases**
2022 (remaining 9 months)	$ 5,478
2023	7,571
2024	7,785
2025	8,007
2026	8,235
2027 and thereafter	20,719
Total minimum lease payments	57,795
Less: imputed interest	10,514
Lease obligations	$ 47,281

Other Commitments

We enter into supply and service arrangements in the normal course of business. Supply arrangements are primarily for fixed-price manufacture and supply. Service agreements are primarily for the development of manufacturing processes and certain studies. Commitments under service agreements are subject to cancellation at our discretion which may require payment of certain cancellation fees. The timing of completion of service arrangements is subject to variability in estimates of the time required to complete the work.

The following table provides quantitative data regarding our other commitments. Future minimum payments reflect amounts that we expect to pay including potential obligations under services agreements subject to risk of cancellation by us (in thousands):

Other Commitment Agreement Type	Agreement Date	Future Minimum Payment
Development and manufacturing services agreements	Various	$ 5,111
Facility maintenance agreement	January 2022	1,462
Total other commitments		$ 6,573

Credit Facility

In June 30, 2017, we entered into a credit facility (the “Credit Facility”) with Western Alliance Bank consisting of term loans (“Term Debt”) up to $0.0 million, and advances (“Advances”) under a revolving line of credit ("Revolving Line of Credit") up to $5.0 million with an accounts receivable borrowing base of80% of eligible accounts receivable. The right to take draws on the Term Debt expired on December 31, 2021. On October 1, 2024, loans drawn under the Revolving Line of Credit terminate. Advances made under the Revolving Line of Credit bear interest at a variable annual rate equal to the greater of (i) 4.25% or (ii) the sum of (A) the prime rate plus (B)1.00%. As of March 31, 2022 and December 31, 2021, we have not drawn from the Credit Facility.

Our obligations under the Credit Facility are secured by a lien on substantially all of our personal property other than our intellectual property. The Credit Facility includes a number of customary covenants and restrictive financial covenants including meeting minimum product revenue levels and maintaining certain minimum cash levels with the lender. The Credit Facility's financial covenants restrict the ability of the Company to transfer collateral, incur additional indebtedness, engage in mergers or acquisitions, pay dividends or make other distributions, make investments, create liens, sell assets, or sell certain assets held at foreign subsidiaries. A failure to comply with these covenants could permit the lender to exercise remedies against us and the collateral securing the Credit Facility, including foreclosure of our properties securing the Credit Facilities and our cash. As of March 31, 2022, we were in compliance with the covenants for the Credit Facility.

Legal Proceedings

We may be involved in legal actions in the ordinary course of business, including inquiries and proceedings concerning business practices and intellectual property infringement, employee relations and other claims. We will recognize a loss contingency in the condensed consolidated financial statements when it is probable a liability has been incurred and the amount of the loss can be reasonably estimated. We will disclose any loss contingencies that do not meet both conditions if there is a reasonable possibility that a material loss may have been incurred. Gain contingencies are not recorded until they are realized.

In April 2022, we reached a settlement resolving a non-material dispute involving the Company's trademark. The terms of the settlement are not material to the business or the results of operations of the Company.

Indemnifications

We are required to recognize a liability for the fair value of any obligations we assume upon the issuance of a guarantee. We have certain agreements with licensors, licensees and collaborators that contain indemnification provisions. In such provisions, we typically agree to indemnify the licensor, licensee and collaborator against certain types of third party claims. The maximum amount of the indemnifications is not limited. We accrue for known indemnification issues when a loss is probable and can be reasonably estimated. There were no accruals for expenses related to indemnification issues for any periods presented.

Note 11. Related Party Transactions

Molecular Assemblies, Inc.

In June 2020, we entered into a Stock Purchase Agreement with MAI pursuant to which we purchased 1,587,050 shares of MAI's Series A preferred stock for $1.0 million. In connection with the transaction, John Nicols, our President and Chief Executive Officer, also joined MAI's board of directors. Concurrently with our initial equity investment, we entered into a Master Collaboration and Research Agreement with MAI (the "MAI Agreement"), pursuant to which we are leveraging our CodeEvolver® protein engineering platform technology to improve the DNA polymerase enzymes that are critical for enzymatic DNA synthesis. Under the MAI Agreement, we are performing services utilizing our CodeEvolver® protein engineering platform technology to improve DNA polymerase enzymes in exchange for compensation in the form of additional shares of MAI's Series A preferred stock. We completed the R&D service with MAI pursuant to the MAI Agreement during the first quarter of 2022. In December 2021, we received the primary milestone payment pursuant to the MAI Agreement of $1.0 million in the form of an additional 1,587,049 shares of Series B preferred stock. In addition to our initial equity investment and the shares we have received under the MAI Agreement, in April 2021, we purchased an additional 1,000,000 shares of MAI's Series A preferred stock for $0.6 million and in September 2021, we purchased 9,198,423 shares of MAI's Series B preferred stock for $7.0 million.

We recognized $0.2 million and $0.1 million in research and development revenue from transactions with MAI in the three months ended March 31, 2022 and 2021, respectively. We received nil shares and 1,428,342 shares of MAI's Series A and B preferred stock from research and development services we provided to MAI in the three months ended March 31, 2022 and 2021, respectively. As of March 31, 2022, we have 16,705,320 shares of MAI's Series A and B preferred stock that we have earned or purchased since executing the Stock Purchase Agreement with MAI.

The carrying value of our investment in MAI Series A and B preferred stock was $12.7 million as of March 31, 2022 and December 31, 2021. We had nil and $0.2 million in deferred revenue as of March 31, 2022 and December 31, 2021 respectively. Payment for the services rendered was received in the form of additional shares of Series A and Series B preferred stock.

Note 12. Segment, Geographical and Other Revenue Information

Segment Information

We manage our business as two business segments: Performance Enzymes and Novel Biotherapeutics. Our chief operating decision maker ("CODM") is our Chief Executive Officer. Our business segments are primarily based on our organizational structure and our operating results as used by our CODM in assessing performance and allocating resources for the Company.

We report corporate-related expenses such as legal, accounting, information technology, and other costs that are not otherwise included in our reportable business segments as "Corporate costs." All items not included in income (loss) from operations are excluded from the business segments.

We manage our assets on a total company basis, not by business segment, as the majority of our operating assets are shared or commingled. Our CODM does not review asset information by business segment in assessing performance or allocating resources, and accordingly, we do not report asset information by business segment.

Factors considered in determining the two reportable segments of the Company include the nature of business activities, the management structure directly accountable to our CODM for operating and administrative activities, availability of discrete financial information and information presented to the Board of Directors. Our CODM regularly reviews our segments and the approach provided by management for performance evaluation and resource allocation.

Operating expenses that directly support the segment activity are allocated based on segment headcount, revenue contribution or activity of the business units within the segments, based on the corporate activity type provided to the segment. The expense allocation excludes certain corporate costs that are separately managed from the segments. This provides the CODM with more meaningful segment profitability reporting to support operating decisions and allocate resources.

The following table provides financial information by our reportable business segments along with a reconciliation to consolidated loss before income taxes (in thousands):

	Three Months Ended March 31, 2022			Three Months Ended March 31, 2021		
	Performance Enzymes	Novel Biotherapeutics	Total	Performance Enzymes	Novel Biotherapeutics	Total
Revenues:						
Product revenue	$ 30,690	$ —	$ 30,690	$ 10,226	$ —	$ 10,226
Research and development revenue	2,409	2,241	4,650	4,003	3,803	7,806
Total revenues	33,099	2,241	35,340	14,229	3,803	18,032
Costs and operating expenses:						
Cost of product revenue	8,521	—	8,521	4,218	—	4,218
Research and development [1]	6,122	12,346	18,468	6,444	4,605	11,049
Selling, general and administrative [1]	3,541	720	4,261	2,818	600	3,418
Total segment costs and operating expenses	18,184	13,066	31,250	13,480	5,205	18,685
Income (loss) from operations	$ 14,915	$ (10,825)	4,090	$ 749	$ (1,402)	(653)
Corporate costs [2]			(11,205)			(7,728)
Unallocated depreciation and amortization			(1,232)			(685)
Loss before income taxes			$ (8,347)			$ (9,066)

[1] Research and development expenses and selling, general and administrative expenses exclude depreciation and amortization of finance leases.
[2] Corporate costs include unallocated selling, general and administrative expenses, interest income, and other expense, net.

The following table provides stock-based compensation expense included in income (loss) from operations (in thousands):

	Three Months Ended March 31,							
	2022				2021			
	Performance Enzymes	Novel Biotherapeutics	Corporate cost	Total	Performance Enzymes	Novel Biotherapeutics	Corporate cost	Total
Stock-based compensation	$ 1,487	$ 410	$ 1,941	$ 3,838	$ 994	$ 238	$ 1,455	$ 2,687

Significant Customers

Customers that each accounted for 10% or more of our total revenues were as follows:

	Percentage of Total Revenues for the Three Months Ended March 31,			
	2022		2021	
Customer A	61	%	*	
Customer B	*		28	%
Customer C	*		11	%
Customer D	*		10	%
Customer E	*		14	%

** Percentage was less than 10%*

Customers that each accounted for 10% or more of accounts receivable balances as of the periods presented as follows:

	Percentage of Accounts Receivables as of			
	March 31, 2022		December 31, 2021	
Customer A	65	%	62	%

Geographical Information

Geographic revenues are identified by the location of the customer and consist of the following (in thousands):

	Three Months Ended March 31,	
	2022	2021
Revenues:		
Americas	$ 3,732	$ 4,929
EMEA	4,127	6,282
APAC	27,481	6,821
Total revenues	$ 35,340	$ 18,032

Identifiable long-lived assets by location was as follows (in thousands):

	March 31, 2022	December 31, 2021
United States	$ 66,386	$ 65,457

Identifiable goodwill by reporting unit was as follows (in thousands):

	As of March 31, 2022 and December 31, 2021		
	Performance Enzymes	Novel Biotherapeutics	Total
Goodwill	$ 2,463	$ 778	$ 3,241

Note 13. Allowance for Credit Losses

The following table summarizes the financial assets allowance for credit losses (in thousands):

	Three Months Ended March 31,	
	2022	2021
Balance at beginning of period	$ 416	$ 74
Provision for credit losses	—	—
Balance at end of period	$ 416	$ 74

The following tables summarize accounts receivable by aging category (in thousands):

	March 31, 2022					
	Current	31-60 Days	61-90 Days	91 Days and over	Total over 31 Days	Total balance
Accounts receivable	$ 24,244	$ 27	$ 89	$ 837	$ 953	$ 25,197

	December 31, 2021					
	Current	31-60 Days	61-90 Days	91 Days and over	Total over 31 Days	Total balance
Accounts receivable	$ 22,697	$ 536	$ 569	$ 1,151	$ 2,256	$ 24,953

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

The following management's discussion and analysis of our financial condition and results of operations should be read in conjunction with the unaudited condensed consolidated financial statements and the related notes thereto included elsewhere in this Quarterly Report on Form 10-Q and the audited consolidated financial statements and notes thereto and management's discussion and analysis of financial condition and results of operations for the year ended December 31, 2021 included in our Annual Report on Form 10-K for the year ended December 31, 2021, as filed with the SEC on February 28, 2022 (the "Annual Report"). This Quarterly Report on Form 10-Q contains forward-looking statements within the meaning of Section 21E of the Securities Exchange Act of 1934, as amended (the "Exchange Act"). These statements include, but are not limited to, expectations regarding our strategy, business plans, financial performance and developments relating to our industry. These statements are often identified by the use of words such as "may," "will," "expect," "believe," "anticipate," "intend," "could," "should," "estimate," or "continue," and similar expressions or variations. Such forward-looking statements are subject to risks, uncertainties and other factors that could cause actual results and the timing of certain events to differ materially from future results expressed or implied by such forward-looking statements. Factors that could cause or contribute to such differences include, but are not limited to, those discussed in Part II, Item 1A: "Risk Factors" of this Quarterly Report on Form 10-Q and Part I, Item 1A: "Risk Factors" of our Annual Report, as incorporated herein and referenced in Part II, Item 1A: "Risk Factors" of this Quarterly Report on Form 10-Q and elsewhere in this report. The forward-looking statements in this Quarterly Report on Form 10-Q represent our views as of the date of this Quarterly Report on Form 10-Q. We anticipate that subsequent events and developments will cause our views to change. However, while we may elect to update these forward-looking statements at some point in the future, we have no current intention of doing so except to the extent required by applicable law. You should, therefore, not rely on these forward-looking statements as representing our views as of any date subsequent to the date of this Quarterly Report on Form 10-Q.

BUSINESS OVERVIEW

We discover, develop and sell enzymes and other proteins that deliver value to our clients in a growing set of industries. We view proteins as a vast, largely untapped source of value-creating products, and we are using our proven technologies, which we have been continuously improving since our inception in 2002, to commercialize an increasing number of novel enzymes, both as proprietary Codexis products and in partnership with our customers.

We are a pioneer in harnessing computational technologies to drive biology advancements. Since 2002, we have made substantial investments in the development of our CodeEvolver® protein engineering technology platform, the primary source of our competitive advantage. Our technology platform is powered by proprietary, artificial intelligence-based, computational algorithms that rapidly mine the structural and performance attributes of our large and continuously growing library of protein variants. These computational outputs enable increasingly reliable predictions for next generation protein variants to be engineered, enabling time- and cost-efficient delivery of the targeted performance enhancements. In addition to its computational prowess, our CodeEvolver® protein engineering technology platform integrates additional modular competencies, including robotic high-throughput screening and genomic sequencing, organic chemistry and bioprocess development which are all coordinated to rapidly innovate novel, fit-for-purpose products.

The core historical application of the technology has been in developing commercially viable biocatalytic manufacturing processes for more sustainable production of complex chemicals. It begins by conceptually designing the most cost-effective and practical process for a targeted product. We then develop optimized biocatalysts to enable the designed process, using our CodeEvolver® platform. Engineered biocatalyst candidates, numbering many thousands for each project, are then rapidly screened and validated using high throughput methods under process-relevant operating conditions. This approach results in an optimized biocatalyst that enables cost-efficient processes that are relatively simple to run in conventional manufacturing equipment allowing for efficient technical transfer of our processes to our manufacturing partners. This also allows for efficient technical transfer of our processes to our manufacturing partners.

We initially commercialized our CodeEvolver® protein engineering technology platform and products in the manufacture of small molecule pharmaceuticals, which remains a primary business focus. Our customers, which include many large, global pharmaceutical companies, use our technology, products and services in their process development and in manufacturing. Additionally, we have licensed our proprietary CodeEvolver® protein engineering technology platform to global pharmaceutical companies enabling them to use this technology, in house, to engineer enzymes for their own businesses. In May 2019, we entered into a Platform Technology Transfer and License Agreement (the "Novartis CodeEvolver® Agreement") with Novartis Pharma AG ("Novartis"). The Novartis CodeEvolver® Agreement (Codexis' third such agreement with large pharmaceutical companies) allows Novartis to use our proprietary CodeEvolver® protein engineering platform technology in the field of human healthcare.

As evidence of our strategy to extend our technology beyond pharmaceutical manufacturing, we have also used the technology to develop biocatalysts and enzyme products for use in a broader set of industrial markets, including several large verticals, such as food, feed, consumer care and fine chemicals. In addition, we are using our technology to develop enzymes for various life science related applications, such as next generation sequencing ("NGS"), and polymerase chain reaction ("PCR/qPCR") for in vitro molecular diagnostics and genomic research applications. In December 2019, we entered into a license agreement to provide Roche Sequencing Solutions, Inc. with our first enzyme for this target market: the Company's EvoT4™ DNA ligase. In June 2020, we also entered into the MAI Agreement pursuant to which we are leveraging our CodeEvolver® platform technology to improve the DNA polymerase enzymes that are critical for enzymatic DNA synthesis.

We have been using the CodeEvolver® protein engineering technology platform to develop early stage, novel biotherapeutic product candidates, both in partnership with customers and for our own proprietary Codexis drug candidates. Our first program was for the potential treatment of phenylketonuria ("PKU") in humans. PKU is an inherited metabolic disorder in which the enzyme that converts the essential amino acid phenylalanine into tyrosine is deficient. In October 2017, we entered into a Global Development, Option and License Agreement (the "Nestlé License Agreement") with Societé des Produits Nestlé S.A., formerly known as Nestec Ltd. ("Nestlé Health Science") to advance CDX-6114, our enzyme biotherapeutic product candidate for the potential treatment of PKU. In February 2019, Nestlé Health Science exercised its option to obtain an exclusive license to develop and commercialize CDX-6114. Also in October 2017, we entered into a strategic collaboration agreement with Nestle Health Science ("Nestlé SCA") pursuant to which we and Nestlé Health Science are collaborating to leverage the CodeEvolver® platform technology to develop other novel enzymes for Nestlé Health Science's established Consumer Care and Medical Nutrition business areas. In March 2020, we entered into a Strategic Collaboration and License Agreement ("Takeda Agreement") with Shire Human Genetic Therapies, Inc., a wholly-owned subsidiary of Takeda Pharmaceutical Company Limited ("Takeda") for the research and development of novel gene therapies for certain disease indications, including the treatment of lysosomal storage disorders and a blood factor deficiency.

BUSINESS SEGMENTS

We manage our business as two business segments: Performance Enzymes and Novel Biotherapeutics. See Note 12, "Segment, Geographical and Other Revenue Information" in the Notes to Unaudited Condensed Consolidated Financial Statements included in this Quarterly Report on Form 10-Q.

Performance Enzymes

We initially commercialized our CodeEvolver® protein engineering technology platform and products in the manufacture of small molecule pharmaceuticals and, to date, this continues to be our largest market served. Our customers, which include many large global pharmaceutical companies, use our technology, products and services in their manufacturing processes and process development. We have also used the technology to develop customized enzymes for use in other industrial markets. These markets consist of several large industrial verticals, including food, feed, consumer care, and fine chemicals. We also use our technology in the life sciences markets to develop enzymes for customers using NGS and PCR/qPCR for in vitro molecular diagnostic and molecular biology research applications, as well DNA/RNA synthesis and health monitoring applications.

Novel Biotherapeutics

We are also targeting new opportunities in the pharmaceutical industry to discover, improve, and/or develop biotherapeutic drug candidates. We believe that our CodeEvolver® protein engineering platform technology can be used to discover novel biotherapeutic drug candidates that will target human diseases that are in need of improved therapeutic interventions. Similarly, we believe that we can deploy our platform technology to improve specific characteristics of a customer's pre-existing biotherapeutic drug candidate, such as its activity, stability or immunogenicity.

BUSINESS UPDATE REGARDING COVID-19

We are subject to risks and uncertainties as a result of the current COVID-19 pandemic. The COVID-19 pandemic has presented a substantial public health and economic challenge around the world and is affecting our employees, communities and business operations, as well as the U.S. economy and other economies worldwide. The full extent to which the COVID-19 pandemic will directly or indirectly impact our business, results of operations and financial condition will depend on future developments that are highly uncertain and may not be accurately predicted, including the duration and severity of the pandemic, the prevalence of more contagious and or virulent variants such as the Delta and Omicron variants, and the extent and severity of the impact on our customers, new information that may emerge concerning COVID-19, the actions taken to contain it or treat its impact and the economic impact on local, regional, national and international markets.

To date, we and our collaboration partners have been able to continue to supply our enzymes to our customers worldwide, however, there can be no guarantee this will continue. Furthermore, our ability to provide future R&D services will continue to be impacted as a result of governmental orders and any disruptions in operations of our customers with whom we collaborate. We believe that these disruptions have had minimal impact on our revenue for the three months ended March 31, 2022. The extent to which the pandemic may impact our business operations and operating results will continue to remain highly dependent on future developments, which are uncertain and cannot be predicted with confidence.

As a result of the COVID-19 pandemic we have received purchase orders from Pfizer for large quantities of our proprietary enzyme product, CDX-616, for use by Pfizer in the manufacture of a critical intermediate for its proprietary active pharmaceutical ingredient, nirmatrelvir, used by Pfizer in combination with the active pharmaceutical ingredient ritonavir, as its PAXLOVID™ (nirmatrelvir tablets; ritonavir tablets) product for the treatment of COVID-19 infections in humans. These purchase orders have had substantial impact on our revenue for the three months ended March 31, 2022 and for the year ended December 31, 2021.

Our future results of operations and liquidity could be adversely impacted by delays in payments of outstanding receivable amounts beyond normal payment terms, supply chain disruptions and uncertain demand, and the impact of any initiatives or programs that we may undertake to address financial and operations challenges faced by our customers. The near-and-long term impact of COVID-19 to our financial condition, liquidity, or results of operations remains uncertain. Although some of the Orders that were enacted to control the spread of COVID-19 have begun to be scaled back and the vaccine rollout has expanded, surges in the spread of COVID-19 due to the emergence of new more contagious or virulent variants or the ineffectiveness of the vaccines against such strains, may result in the reimplementation of certain Orders, which could adversely impact our business. The extent to which the COVID-19 pandemic may materially impact our financial condition, liquidity, or results of operations in the future is uncertain.

Results of Operations Overview

Revenues were $35.3 million in the first quarter of 2022, a 96% increase from $18.0 million in the first quarter of 2021.

Product revenue, which consists primarily of sales of biocatalysts, pharmaceutical intermediates, and Codex® biocatalyst panels and kits, was $30.7 million in the first quarter of 2022, an increase of 200% from $10.2 million in the first quarter of 2021. The increase in product revenue was primarily due to $21.3 million in revenue from Pfizer related to the purchase of our CDX-616 enzyme products but partially offset by lower revenue from the sales of other enzyme products used in the manufacture of branded pharmaceutical products. We expect the significant purchase orders we have received from Pfizer for CDX-616 enzyme products to continue to remain a significant component of our product revenue in 2022.

Research and development revenues, which include license, technology access and exclusivity fees, research service fees, milestone payments, royalties, and optimization and screening fees, totaled $4.7 million in the first quarter of 2022, a 40% decrease compared with $7.8 million in the first quarter of 2021. The decrease in research and development revenue was primarily due to lower research and development fees from Takeda under the Takeda Agreement and lower research and development fees from other existing collaboration agreements being recognized in the first quarter of 2022 as compared to the same period in the prior year.

Our products' profitability is affected by many factors including the average profit margin on the products we sell. Our profit margins are affected by many factors including the costs of internal and third-party fixed and variable costs, including materials and supplies, labor, facilities and other overhead costs. Profit margin data is used as a management performance measure to provide additional information regarding our results of operations on a consolidated basis. Product gross margins increased to 72% in the first quarter of 2022, compared to 59% in the first quarter of 2021, due to improved product mix resulting from sales to Pfizer and to other pharmaceutical customers.

Research and development expenses were $19.5 million in the first quarter of 2022, an increase of 69% from $11.6 million in the first quarter of 2021. The increase was primarily due to increases in costs associated with higher headcount, higher facilities cost and lab supplies, higher stock-based compensation and higher depreciation expense and other outside services. We expect research and development expenses for the rest of the year to be higher than the comparative prior year periods mainly due to increase in headcount and higher allocation of facilities cost due to the additional research and development laboratory space we commenced occupancy in December 2021, and as we continue our efforts on advancing our internal and collaborative programs.

Selling, general and administrative expenses were $15.7 million in the first quarter of 2022, an increase of 38%, compared to $11.4 million in the first quarter of 2021. The increase was primarily due to increase in costs associated with a higher headcount, increase in legal fees, higher stock-based compensation costs, higher outside and temporary services, partially offset by lower allocable expenses. We expect selling, general and administrative expenses for the rest of the year to be higher than the comparative prior year periods mainly due to increase in headcount and higher operating costs as we invest more in our business.

Net loss was $8.4 million, or a net loss of $0.13 per basic and diluted share in the first quarter of 2022 compared to a net loss of $9.1 million, or a net loss of $0.14 per basic and diluted share in the first quarter of 2021. The decrease in net loss is primarily related to an increase in product revenue with higher margins, partially offset by higher operating expenses and lower research and development revenues.

Cash and cash equivalents decreased to $94.3 million of March 31, 2022 compared to $116.8 million as of December 31, 2021.In addition, net cash used in operations was $11.2 million in the three months ended March 31, 2022 compared to $6.4 million in the three months ended March 31, 2021. We believe that based on our current level of operations, our existing cash and cash equivalents will provide adequate funds for ongoing operations, planned capital expenditures and working capital requirements for at least the next 12 months.

In June 2017, we entered into a loan and security agreement with Western Alliance Bank that allows us to borrow up to $10.0 million under a term loan, and up to $5.0 million under a revolving credit facility with 80% of certain eligible accounts receivable as a borrowing base (the "Credit Facility"). Obligations under the Credit Facility are secured by a lien on substantially all of our personal property other than our intellectual property. Draws on the term debt are subject to customary conditions for funding. Our ability to take draws on the term debt expired on December 31, 2021. As of March 31, 2022, no amounts were borrowed under the Credit Facility and we were in compliance with the covenants for the Credit Facility. See Note 10, "Commitments and Contingencies" in the Notes to Unaudited Condensed Consolidated Financial Statements included in this Quarterly Report on Form 10-Q.

Merck Sitagliptin Catalyst Supply Agreement

In February 2012, we entered into a five-year Sitagliptin Catalyst Supply Agreement (“Sitagliptin Supply Agreement”) with Merck whereby Merck may obtain commercial scale enzyme for use in the manufacture of Januvia®, its product based on the active ingredient sitagliptin. In December 2015, Merck exercised its option under the terms of the Sitagliptin Catalyst Supply Agreement to extend the agreement for an additional five years through February 2022. In September 2021, the Sitagliptin Catalyst Supply Agreement was amended to extend the agreement through December 2026.

Effective as of January 2016, we and Merck amended the Sitagliptin Supply Agreement to prospectively provide for variable pricing based on the cumulative volume of sitagliptin enzyme purchased by Merck. We have previously determined that the variable pricing, which provides a discount based on the cumulative volume of sitagliptin enzyme purchased by Merck, provides Merck material rights and we recognized product revenues using the alternative method wherein we estimated the total expected consideration and allocated it proportionately with the expected sales. Pursuant to the latest amendment of the Sitagliptin Supply Agreement, we have determined that the latest price per volume of sitagliptin enzyme to be purchased by Merck no longer provides Merck material rights, and as such we are recognizing product revenue based on contractually stated prices effective as of February 2022.

We recognized $1.7 million and $3.3 million in product revenue under this contract for the three months ended March 31, 2022 and 2021, respectively. Revenues recognized by us under the Sitagliptin Supply Agreement comprised 5% and 18% of our total revenues for the three months ended March 31, 2022 and 2021, respectively.

For the three months ended March 31, 2022, we recorded revenue of $1.2 million from sitagliptin enzyme that were recognized over time based on the progress of the manufacturing process. These products will be shipped within the six month period following the end of the first quarter of 2022.

Global Development, Option and License Agreement and Strategic Collaboration Agreement

In October 2017, we entered into the Nestlé License Agreement with Nestlé Health Science and, solely for the purpose of the integration and the dispute resolution clauses of the Nestlé License Agreement, Nestlé Health Science S.A., to advance CDX-6114, our enzyme biotherapeutic product candidate for the potential treatment of PKU.

In January 2019, we received notice from the U.S. Food and Drug Administration ("FDA") that it had completed its review of our IND for CDX-6114 and concluded that we may proceed with the proposed Phase 1b multiple ascending dose study in healthy volunteers in the United States. In February 2019, Nestlé Health Science exercised its option to obtain an exclusive, worldwide, royalty-bearing, sub-licensable license for the global development and commercialization of CDX-6114 for the management of PKU. Upon exercising its option, Nestlé Health Science made an option payment and assumed all responsibilities for future clinical development and commercialization of CDX-6114. We are also eligible to receive payments from Nestlé Health Science under the Nestlé License Agreement that include (i) development and approval milestones of up to $85.0 million, (ii) sales-based milestones of up to $250.0 million in the aggregate, which aggregate amount is achievable if net sales exceed $1.0 billion in a single year, and (iii) tiered royalties, at percentages ranging from the mid-single digits to low double-digits of net sales of product.

In October 2017, we entered into the Nestlé SCA pursuant to which we and Nestlé Health Science are collaborating to leverage the CodeEvolver® protein engineering technology platform to develop novel enzymes for Nestlé Health Science's established Consumer Care and Medical Nutrition business areas. The term of the Nestlé SCA has been extended through December 2022.

In January 2020, we entered into a development agreement with Nestlé Health Science pursuant to which we and Nestlé Health Science are collaborating to advance a lead candidate, CDX-7108, targeting a gastrointestinal disorder discovered through our Nestlé SCA into preclinical and early clinical studies. During 2021, we, together with Nestlé Health Science, continued to advance CDX-7108 towards initiation of a Phase 1 clinical trial with the first subject being dosed in November 2021.

Under the Nestlé SCA and the development agreement, we recognized $1.1 million and $1.8 million in research and development fees for the three months ended March 31, 2022 and 2021, respectively.

Platform Technology Transfer and License Agreement

In May 2019, we entered into the Novartis CodeEvolver® Agreement with Novartis. The Agreement allows Novartis to use our proprietary CodeEvolver® protein engineering platform technology in the field of human healthcare. In July 2021, we announced the completion of the technology transfer period during which we transferred our proprietary CodeEvolver® protein engineering platform technology to Novartis (the "Technology Transfer Period"). As a part of this technology transfer, the Company provided to Novartis our proprietary enzymes, proprietary protein engineering protocols and methods, and proprietary software algorithms. In addition, our teams and Novartis scientists participated in technology training sessions and collaborative research projects at our laboratories in Redwood City, California and at a designated Novartis laboratory in Basel, Switzerland. Novartis has now installed the CodeEvolver® protein engineering platform technology at its designated laboratory.

Pursuant to the agreement, we received an upfront payment of $5.0 million shortly after the effective date of the Novartis CodeEvolver® Agreement. We completed the second technology milestone transfer under the agreement in 2020 and received a milestone payment of $4.0 million. We have also received an aggregate of $5.0 million for the completion of the third technology milestone in 2021. In consideration for the continued disclosure and license of improvements to the technology and materials during a multi-year period that began on the conclusion of the Technology Transfer Period ("Improvements Term"), Novartis will pay Codexis annual payments over four years which amount to an additional $8.0 million in aggregate. The Company also has the potential to receive quantity-dependent, usage payments for each API that is manufactured by Novartis using one or more enzymes that have been developed or are in development using the CodeEvolver® protein engineering platform technology during the period that began on the conclusion of the Technology Transfer Period and ends on the expiration date of the last to expire licensed patent. Revenue for the combined initial license and technology transfer performance obligation was recognized using a single measure of progress that depicted our performance in transferring control of the services. Revenue allocated to improvements made during the Improvements Term are being recognized during the Improvements Term.

We recognized $0.2 million and $0.8 million in research and development revenue for the three months ended March 31, 2022 and 2021, respectively.

Strategic Collaboration and License Agreement

In March 2020, we entered into the Takeda Agreement with Shire Human Genetic Therapies, Inc., a wholly-owned subsidiary of Takeda Pharmaceutical Co. Ltd. ("Takeda"), under which we are collaborating to research and develop protein sequences for use in gene therapy products for certain diseases in accordance with each applicable program plan.

On execution of the Takeda Agreement, we received an upfront non-refundable cash payment of $8.5 million and we initiated activities under three program plans for Fabry Disease, Pompe Disease, and an undisclosed blood factor deficiency, respectively (the "Initial Programs"). In May 2021, Takeda elected to exercise its option to initiate an additional program for a certain undisclosed rare genetic disorder; as a result we received the option exercise fee during the third quarter of 2021. Pursuant to the Takeda Agreement, we are eligible to receive other payments that include (i) reimbursement of research and development fees and preclinical development milestones for the three initial programs of $10.5 million, in aggregate, and $7.2 million for the fourth program, (ii) clinical development and commercialization-based milestones, per target gene, of up to $100.0 million and (iii) tiered royalty payments based on net sales of applicable products at percentages ranging from the mid-single digits to low single-digits.

Revenue recognized relating to the functional licenses provided to Takeda was recognized at a point in time when the control of the license transferred to the customer. We recognized research and development revenue related to the Takeda Agreement of $1.2 million and $2.1 million for the three months ended March 31, 2022 and 2021, respectively.

Pfizer, Inc. purchase orders

In 2021, we received purchase orders from Pfizer, Inc. ("Pfizer") for large quantities of our proprietary enzyme product, CDX-616, for use by Pfizer in the manufacture of a critical intermediate for its proprietary active pharmaceutical ingredient, nirmatrelvir. Pfizer markets, sells and distributes nirmatrelvir, in combination with the active pharmaceutical ingredient ritonavir, as its PAXLOVID™ (nirmatrelvir tablets; ritonavir tablets) product, which received emergency use authorization by the FDA in late 2021 for the treatment of COVID-19 in humans.

We have received additional purchase orders from Pfizer for significant quantities of CDX-616. As of March 31, 2022, we have not yet executed a long-term purchase and sale agreement with Pfizer for CDX-616. We currently expect that future orders for quantities of CDX-616 by Pfizer will continue to be based on the needs of Pfizer for quantities of CDX-616 and there will be no minimum purchase obligation on the part of Pfizer.

We recognized product revenue of $21.3 million and $0.4 million for the three months ended March 31, 2022 and 2021, respectively, from the sale of quantities of CDX-616 enzyme products to Pfizer. Revenues recognized by us from sales of CDX-616 enzyme products to Pfizer comprised 60% and 2% of our total revenues for the three months ended March 31, 2022 and 2021, respectively. As of March 31, 2022, we recorded revenue and contract assets of $7.1 million from the sale of this enzyme product that were recognized over time based on the progress of the manufacturing process. These products will be shipped within the three month period following the end of the first quarter of 2022.

Results of Operations

The following table shows the amounts from our unaudited condensed consolidated statements of operations for the periods presented (in thousands, except percentages):

	Three Months Ended March 31,		Change	
	2022	2021	$	%
Revenues:				
Product revenue	$ 30,690	$ 10,226	$ 20,464	200%
Research and development revenue	4,650	7,806	(3,156)	(40)%
Total revenues	35,340	18,032	17,308	96%
Costs and operating expenses:				
Cost of product revenue	8,521	4,218	4,303	102%
Research and development	19,500	11,571	7,929	69%
Selling, general and administrative	15,705	11,398	4,307	38%
Total costs and operating expenses	43,726	27,187	16,539	61%
Loss from operations	(8,386)	(9,155)	769	(8)%
Interest income	42	177	(135)	(76)%
Other expense, net	(3)	(88)	85	(97)%
Loss before income taxes	(8,347)	(9,066)	719	(8)%
Provision for income taxes	9	2	7	350%
Net loss	$ (8,356)	$ (9,068)	$ 712	(8)%

Revenues

Our revenues consist of product revenue and research and development revenue as follows:

- Product revenue consist of sales of biocatalysts, pharmaceutical intermediates, and Codex® biocatalyst panels and kits.
- Research and development revenue include license, technology access and exclusivity fees, research services fees, milestone payments, royalties, optimization and screening fees.

Revenues are as follows (in thousands, except percentages):

	Three Months Ended March 31,		Change	
	2022	2021	$	%
Product revenue	$ 30,690	$ 10,226	$ 20,464	200%
Research and development revenue	4,650	7,806	(3,156)	(40)%
Total revenues	$ 35,340	$ 18,032	$ 17,308	96%

Revenues typically fluctuate on a quarterly basis due to the variability in our customers' manufacturing schedules and the timing of our customers' clinical trials. In addition, we have limited internal capacity to manufacture enzymes. As a result, we are dependent upon the performance and capacity of third-party manufacturers for the commercial scale manufacturing of the enzymes used in our pharmaceutical and fine chemicals business.

We accept purchase orders for deliveries covering periods from one day up to 14 months from the date on which the order is placed. However, some of our purchase orders can be revised or cancelled by the customer without penalty. Considering these industry practices and our experience, we do not believe the total of customer purchase orders outstanding (backlog) provides meaningful information that can be relied on to predict actual sales for future periods.

Total revenues increased by $17.3 million to $35.3 million in the three months ended March 31, 2022 compared to the same period in 2021, primarily due to higher product revenue but partially offset by lower research and development revenue.

Product revenue, increased by $20.5 million to $30.7 million in the three months ended March 31, 2022 compared to the same period in 2021, primarily due to $21.3 million in revenue from Pfizer related to the purchase of our CDX-616 enzyme products but partially offset by lower revenue from sales of other enzyme products used in the manufacture of branded pharmaceutical products.

Research and development revenue decreased by $3.2 million to $4.7 million in the three months ended March 31, 2022 compared to the same period in 2021, primarily due to lower research and development fees from Takeda under the Takeda Agreement and lower research and development fees from other existing collaboration agreements being recognized in the first quarter of 2022 as compared to the same period in the prior year.

Cost and Operating Expenses

Our cost and operating expenses consist of cost of product revenue, research and development expense, and selling, general and administrative expense. The following table shows the amounts of our cost of product revenue, research and development expense, and selling, general and administrative expense from our unaudited condensed consolidated statements of operations for the periods presented (in thousands, except percentages):

	Three Months Ended March 31,		Change	
	2022	2021	$	%
Cost of product revenue	$ 8,521	$ 4,218	$ 4,303	102%
Research and development	19,500	11,571	7,929	69%
Selling, general and administrative	15,705	11,398	4,307	38%
Total costs and operating expenses	$ 43,726	$ 27,187	$ 16,539	61%

Cost of Product Revenue and Product Gross Margin

Our product revenues are derived entirely from our Performance Enzymes segment. Revenues from the Novel Biotherapeutics segment are only from collaborative research and development activities.

The following table shows the amounts of our product revenue, cost of product revenue, product gross profit and product gross margin from our unaudited condensed consolidated statements of operations for the periods presented (in thousands, except percentages):

	Three Months Ended March 31,		Change	
	2022	2021	$	%
Product revenue	$ 30,690	$ 10,226	$ 20,464	200%
Cost of product revenue [1]	8,521	4,218	4,303	102%
Product gross profit	$ 22,169	$ 6,008	$ 16,161	269%
Product gross margin (%) [2]	72 %	59 %		

[1] Cost of product revenue consists of both internal and third-party fixed and variable costs, including materials and supplies, labor, facilities and other overhead costs associated with our product revenue.

[2] Product gross margin is used as a performance measure to provide additional information regarding our results of operations on a consolidated basis .

Cost of product revenue increased by $4.3 million in the three months ended March 31, 2022 compared to the same period in 2021. The increase was primarily due to a higher volume of product sales and variations in product mix. The product gross margin increased to 72% in the three months ended March 31, 2022 compared to 59% in the three months ended March 31, 2021, primarily due to the sale of higher margin branded products.

Research and Development Expenses

Research and development expenses consist of costs incurred for internal projects as well as collaborative research and development activities. These costs primarily consist of (i) employee-related costs, which include salaries and other personnel-related expenses (including stock-based compensation), (ii) various allocable expenses, which include occupancy-related costs, supplies, depreciation of facilities and laboratory equipment, and (iii) external costs. Research and development expenses are expensed when incurred.

Research and development expenses were $19.5 million in the first quarter of 2022, an increase of $7.9 million or 69%, from $11.6 million in the first quarter of 2021. The increase was primarily due to increases in costs associated with higher headcount, higher facilities cost and lab supplies, higher stock-based compensation and higher depreciation expense and other outside services.

Selling, General and Administrative Expenses

Selling, general and administrative expenses consist of employee-related costs, which include salaries and other personnel-related expenses (including stock-based compensation), hiring and training costs, consulting and outside services expenses (including audit and legal counsel related costs), marketing costs, building lease costs, and depreciation expenses and amortization expenses.

Selling, general and administrative expenses were $15.7 million in the first quarter of 2022, an increase of $4.3 million, or 38%, compared to $11.4 million in the first quarter of 2021. The increase was primarily due to increase in costs associated with a higher headcount, increase in legal fees, higher stock-based compensation costs, higher outside and temporary services, partially offset by lower allocable expenses.

Interest Income and Other Expense, net (in thousands, except percentages):

	Three Months Ended March 31,		Change	
	2022	2021	$	%
Interest income	$ 42	$ 177	$ (135)	(76)%
Other expense, net	(3)	(88)	85	97%
Total other income (expense), net	$ 39	$ 89	$ (50)	(56)%

Interest Income

Interest income decreased by $0.1 million in the three months ended March 31, 2022 compared to the same period in 2021, primarily due to earned interest income and amortization of debt discount on non-marketable debt security in prior year and reduction in interest income from lower average interest rates on declining average cash balances.

Other Expense, net

Other expense, net, decreased by $85.0 thousand in the three months ended March 31, 2022 compared to the same period in 2021, primarily due to interest expense charges recognized on the amortization of an embedded bifurcated derivative of a share-settled redemption feature on non-marketable securities in prior year.

Provision for Income Taxes (in thousands, except percentages):

	Three Months Ended March 31,		Change	
	2022	2021	$	%
Provision for income taxes	$ 9	$ 2	$ 7	350%

The provision for income taxes for the three months ended March 31, 2022 and 2021, were primarily due to the accrual of interest and penalties on historic uncertain tax positions.

Net Loss

Net loss for the three months ended March 31, 2022 was $8.4 million, or a net loss per basic and diluted share of $0.13. This compared to a net loss of $9.1 million, or a net loss per basic and diluted share of $0.14 for the three months ended March 31, 2021. The decrease in net loss is primarily related to an increase in product revenues with higher margins, partially offset by higher operating expenses and lower research and development revenues.

Results of Operations by Segment (in thousands, except percentages):

Revenues by segment

	Three Months Ended March 31,						Change			
	2022			2021			Performance Enzymes		Novel Biotherapeutics	
	Performance Enzymes	Novel Biotherapeutics	Total	Performance Enzymes	Novel Biotherapeutics	Total	$	%	$	%
Revenues:										
Product revenue	$ 30,690	$ —	$ 30,690	$ 10,226	$ —	$ 10,226	$ 20,464	200%	$ —	—%
Research and development revenue	2,409	2,241	4,650	4,003	3,803	7,806	(1,594)	(40)%	(1,562)	(41)%
Total revenues	$ 33,099	$ 2,241	$ 35,340	$ 14,229	$ 3,803	$ 18,032	$ 18,870	133%	$ (1,562)	(41)%

Revenues from the Performance Enzymes segment increased by $18.9 million, or 133%, for the three months ended March 31, 2022, compared to the same period in 2021. The increase in product revenue of $20.5 million, or 200%, in the three months ended March 31, 2022 as compared to the same period in 2021, was primarily due to higher revenue from Pfizer but partially offset by lower revenue from the sales of other enzyme products used in the manufacture of branded pharmaceuticals products. The decrease in research and development revenue of $1.6 million, or 40%, to $2.4 million in three months ended March 31, 2021, as compared to $4.0 million in the three months ended March 31, 2021 was primarily due to lower revenues from Novartis under the Novartis CodeEvolver® Agreement as we completed the technology transfer to Novartis during the third quarter of 2021 and lower research and development fees from other existing collaboration agreements compared to the same period in the prior year.

Revenues from the Novel Biotherapeutics segment decreased by $1.6 million, or 41%, for the three months ended March 31, 2022, as compared to the same period in 2021, primarily due to lower research and development fees from Takeda under the Takeda Agreement and lower research and development revenue from Nestlé Health Science.

Costs and operating expenses by segment

	Three Months Ended March 31,						Change			
	2022			2021			Performance Enzymes		Novel Biotherapeutics	
	Performance Enzymes	Novel Biotherapeutics	Total	Performance Enzymes	Novel Biotherapeutics	Total	$	%	$	%
Cost of product revenue	$ 8,521	$ —	$ 8,521	$ 4,218	$ —	$ 4,218	$ 4,303	102%	$ —	—%
Research and development [1]	6,122	12,346	18,468	6,444	4,605	11,049	(322)	(5)%	7,741	168%
Selling, general and administrative [1]	3,541	720	4,261	2,818	600	3,418	723	26%	120	20%
Total segment costs and operating expenses	$ 18,184	$ 13,066	31,250	$ 13,480	$ 5,205	18,685	$ 4,704	35%	$ 7,861	151%
Corporate costs [2]			11,244			7,817				
Unallocated depreciation and amortization			1,232			685				
Total costs and operating expenses			$ 43,726			$ 27,187				

[1] Research and development expenses and selling, general and administrative expenses exclude depreciation and amortization of finance leases.

[2] Corporate costs include unallocated selling, general and administrative expenses.

For a discussion of product cost of revenue, see "*—Results of Operations*".

Research and development expense in the Performance Enzymes segment decreased by $0.3 million, or 5%, in the three months ended March 31, 2022, as compared to the same period in 2021, primarily due to lower allocable expenses, partially offset by an increase in costs associated with outside services, lab supplies and higher headcount.

Selling, general and administrative expense in the Performance Enzymes segment increased by $0.7 million, or 26%, in the three months ended March 31, 2022, as compared to the same period in 2021, primarily due to an increase in costs associated with higher headcount and higher stock-based compensation costs.

Research and development expense in the Novel Biotherapeutics segment increased by $7.7 million, or 168%, in the three months ended March 31, 2022 as compared to the same period in 2021, primarily due to higher costs associated with higher headcount, higher facilities cost and lab supplies and higher allocable expenses.

Selling, general and administrative expense in the Novel Biotherapeutics segment increased by $0.1 million or 20% in the three months ended March 31, 2022, as compared to the same period in 2021, primarily due to an increase in costs associated with higher headcount and higher stock-based compensation costs.

Liquidity and Capital Resources

Liquidity is the measurement of our ability to meet working capital needs and to fund capital expenditures. We have historically funded our operations primarily through cash generated from operations, stock option exercises and public and private offerings of our common stock. We also have the ability to borrow up to $5.0 million under our Credit Facility. We actively manage our cash usage and investment of liquid cash to ensure the maintenance of sufficient funds to meet our working capital needs. Our cash and cash equivalents are held in U.S. banks.

The following summarizes our cash and cash equivalents balance and working capital as of March 31, 2022 and December 31, 2021 (in thousands):

	March 31, 2022	December 31, 2021
Cash and cash equivalents	$ 94,260	$ 116,797
Working capital	$ 115,374	$ 128,517

Sources of Capital

In addition to our existing cash and cash equivalents, we are eligible to earn milestone and other contingent payments for the achievement of defined collaboration objectives and certain royalty payments under our collaboration agreements. Our ability to earn these milestone and contingent payments and the timing of achieving these milestones is primarily dependent upon the outcome of our collaborators' research and development activities and is uncertain at this time. Under the Merck CodeEvolver® Agreement, we are eligible to receive payments of up to $15.0 million for each commercial API that is manufactured by Merck using one or more novel enzymes developed by Merck using the CodeEvolver® technology. In addition, under the GSK CodeEvolver® Agreement, depending upon GSK's successful application of the licensed technology, we have the potential to receive additional contingent payments that range from $5.75 million to $38.5 million per project.

In May 2019, we entered into the Platform Technology Transfer and License Agreement with Novartis. The Novartis CodeEvolver® Agreement allows Novartis to use Codexis' proprietary CodeEvolver® protein engineering platform technology in the field of human healthcare. Pursuant to the agreement, we received an upfront payment of shortly after the effective date and we also received milestone payments upon completion of the second technology milestone transfer in 2020 and the third technology milestone in 2021. In consideration for the continued disclosure and license of improvements to the technology and materials during a multi-year period that began on the conclusion of the Technology Transfer Period ("Improvements Term"), Novartis will pay an additional $8.0 million in aggregate over four years.

In October 2017, we entered into the Nestlé License Agreement with Nestlé Health Science. Pursuant to the Nestlé License Agreement, Nestlé Health Science paid us an upfront cash payment and milestone payments after dosing the first subjects in a first-in-human Phase 1a dose-escalation trial with CDX-6114 and achievement of a formulation relating to CDX-6114. We are also eligible to receive payments from Nestlé Health Science under the Nestlé License Agreement that include (i) development and approval milestones of up to $85.0 million, (ii) sales-based milestones of up to $250.0 million in the aggregate, which aggregate amount is achievable if net sales exceed $1.0 billion in a single year, and (iii) tiered royalties, at percentages ranging from the mid-single digits to low double-digits, of net sales of product.

We are actively collaborating with new and existing customers in the pharmaceutical and food industries. We believe that we can utilize our current products and services, and develop new products and services, to increase our revenues and gross margins in future periods.

We have historically experienced negative cash flows from operations as we continue to invest in key technology development projects and improvements to our CodeEvolver® protein engineering technology platform and expand our business development and collaboration with new customers. Our cash flows from operations will continue to be affected principally by product sales and product gross margins, sales from licensing our technology to major pharmaceutical companies, and collaborative research and development services provided to customers, as well as our headcount costs, primarily in research and development. Our primary source of cash flows from operating activities is cash receipts from our customers for purchases of products, collaborative research and development services, and licensing our technology to major pharmaceutical companies. Our largest uses of cash from operating activities are for employee-related expenditures, rent payments, inventory purchases to support our product sales and non-payroll research and development costs

Equity Distribution Agreement

In May 2021, we entered into an Equity DistributionAgreement ("EDA") with Piper Sandler & Co ("PSC"), under which PSC, as our exclusive agent, at our discretion and at such times that we may determine from time to time, may sell over a three-year period from the execution of the EDA up to a maximum of $50.0 million of shares of our common stock. During the three months ended March 31, 2022, no shares of our common stock were issued pursuant to the EDA and as of March 31, 2022, $50.0 million worth of shares remained available for sale under the EDA. Sales of our common stock under this arrangement could be subject to business, economic or competitive uncertainties and contingencies, many of which may be beyond our control, and which could cause actual results from the sale of our common stock to differ materially from expectations.

Credit Facility

In June 30, 2017, we entered into the Credit Facility with Western Alliance Bank consisting of term loans up to $10.0 million, and advances under a revolving credit facility of up to $5.0 million with an accounts receivable borrowing base of 80% of eligible accounts receivable. Our right to take draws on the term debt expired on December 31, 2021. On October 1, 2024, loans drawn under the Revolving Line of Credit terminate.

The Credit Facility requires us to maintain compliance with certain financial covenants including attainment of certain lender-approved projections or maintenance of certain minimum cash levels. Restrictive covenants in the Credit Facility restrict the payment of dividends or other distributions. As of March 31, 2022, no amounts were borrowed under the Credit Facility and we were in compliance with the covenants for the Credit Facility. For additional information about our contractual obligations, see Note 10, "Commitments and Contingencies" in the Notes to Unaudited Condensed Consolidated Financial Statements included in this Quarterly Report on Form 10-Q.

We believe that, based on our current level of operations, our existing cash and cash equivalents will provide adequate funds for ongoing operations, planned capital expenditures and working capital requirements for at least the next 12 months.

However, we may need additional capital if our current plans and assumptions change. In addition, we may choose to seek other sources of capital even if we believe we have generated sufficient cash flows to support our operating needs. Our need for additional capital will depend on many factors, including the financial success of our business, the spending required to develop and commercialize new and existing products, the effect of any acquisitions of other businesses, technologies or facilities that we may make or develop in the future, our spending on new market opportunities, and the potential costs for the filing, prosecution, enforcement and defense of patent claims, if necessary. If our capital resources are insufficient to meet our capital requirements, and we are unable to enter into or maintain collaborations with partners that are able or willing to fund our development efforts or commercialize any products that we develop or enable, we will have to raise additional funds to continue the development of our technology and products and complete the commercialization of products, if any, resulting from our technologies. If future financings involve the issuance of equity securities, our existing stockholders would suffer dilution. If we raise debt financing or enter into credit facilities, we may be subject to restrictive covenants that limit our ability to conduct our business. We may not be able to raise sufficient additional funds on terms that are favorable to us, if at all. If we fail to raise sufficient funds and fail to generate sufficient revenues to achieve planned gross margins and to control operating costs, our ability to fund our operations, take advantage of strategic opportunities, develop products or technologies, or otherwise respond to competitive pressures could be significantly limited. If this happens, we may be forced to delay or terminate research or development programs or the commercialization of products resulting from our technologies, curtail or cease operations or obtain funds through collaborative and licensing arrangements that may require us to relinquish commercial rights, or grant licenses on terms that are not favorable to us. If adequate funds are not available, we will not be able to successfully execute our business plan or continue our business.

Cash Flows

The following is a summary of cash flows for three months ended March 31, 2022 and 2021 (in thousands):

	Three Months Ended March 31,	
	2022	2021
Net cash used in operating activities	$ (11,186)	$ (6,440)
Net cash used in investing activities	(10,082)	(2,533)
Net cash provided by (used in) financing activities	(1,280)	17
Net decrease in cash, cash equivalents and restricted cash	$ (22,548)	$ (8,956)

Cash Flows from Operating Activities

Cash used in operating activities for the three months ended March 31, 2022 of $11.2 million consisted of net loss adjusted for certain non-cash items and changes in operating assets and liabilities.

The $4.7 million increase in net cash used in operations for the three months ended March 31, 2022 as compared to the same period in 2021, was primarily due to the net effect of increases in cash paid for cost of revenues and operating expenses and changes in operating assets and liabilities, partially offset by increases in cash received from revenue.

Cash Flows from Investing Activities

Cash used in investing activities for the three months ended March 31, 2022 was primarily attributable to $5.0 million for the purchase of 1,000,000 shares of seqWell Series C preferred stock in March 2022 and $5.1 million for purchases of property and equipment.

The $7.5 million increase in net cash used in investing activities for the three months ended March 31, 2022 as compared to the same period in 2021, was primarily due to higher cash utilized for additional investment in equity securities and purchases of property and equipment.

Cash Flows from Financing Activities

Cash used in financing activities for the three months ended March 31, 2022 included $1.4 million for taxes paid related to net share settlement of equity awards offset by $0.2 million of proceeds from exercises of stock options.

The $1.3 million increase in net cash used financing activities for the three months ended March 31, 2022 as compared to the same period in 2021 was primarily due to lower proceeds from exercises of stock options and higher cash paid on taxes related to net share settlement of equity awards.

Critical Accounting Policies and Estimates

The preparation of financial statements in conformity with generally accepted accounting principles requires management to make judgments, estimates and assumptions in the preparation of our consolidated financial statements and accompanying notes. Actual results could differ from those estimates. There have been no material changes to our critical accounting policies or estimates during the three months ended March 31, 2022 from those discussed in our Annual Report on Form 10-K for the year ended December 31, 2021, filed with the SEC on February 28, 2022.

ITEM 3. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Market Risk Management

Our cash flows and earnings are subject to fluctuations due to changes in foreign currency exchange rates, interest rates and other factors. These market risk exposures are disclosed in Part II, Item 7A of our Annual Report on Form 10-K for the year ended December 31, 2021, filed with the SEC on February 28, 2022.

Interest Rate Sensitivity

Our unrestricted cash and cash equivalents total $94.3 million as of March 31, 2022. We primarily invest these amounts in money market funds which are held for working capital purposes. We do not enter into investments for trading or speculative purposes. As of March 31, 2022, the effect of a hypothetical 10% decrease in market interest rates would have a $17 thousand impact on a potential loss in future interest income and cash flows.

In June 2017, we entered into a Credit Facility with Western Alliance Bank consisting of term loans up to $10.0 million, and advances under a revolving line of credit up to $5.0 million. Term loans made under the Term Debt bear interest at variable rate through maturity at the greater of (i) 3.75% or (ii) the sum of (A) Index Rate (prime rate published in the Money Rates section of the Western Edition of The Wall Street Journal plus (B) 0.50%. Advances made under the Revolving Line of Credit bear interest at a variable annual rate equal to the greater of (i) 4.25% or (ii) the sum of (A) the prime rate plus (B) 1.00%. Increases in these variable interest rates will increase our future interest expense and decrease our results of operations and cash flows. Our right to take draws on the long term debt expired on December 31, 2021 and no amounts were drawn under the Credit Facility as of March 31, 2022. Our exposure to interest rates risk relates to our 2017 Credit Facility with variable interest rates, where an increase in interest rates may result in higher borrowing costs. Since we have no outstanding borrowings under our 2017 Credit Facility as of March 31, 2022, the effect of a hypothetical 10% change in interest rates would not have any impact on our interest expense.

Foreign Currency Risk

Our results of operations and cash flows are subject to fluctuations due to changes in foreign currency exchange rates. In periods when the USD declines in value as compared to the foreign currencies in which we incur expenses, our foreign-currency based expenses increase when translated into United States dollars. Although substantially all of our sales are denominated in United States dollars, future fluctuations in the value of the USD may affect the price competitiveness of our products outside the United States. Our most significant foreign currency exposure is due to non-functional currency denominated monetary assets, primarily currencies denominated in other than their functional currency. These non-functional currency denominated monetary assets are subject to re-measurement which may create fluctuations in other expense, net, a component in our consolidated statement of operations and in the fair value of the assets in the consolidated balance sheets. As of March 31, 2022, the effect of a hypothetical 10% unfavorable change in exchange rates on currencies denominated in other than their functional currency would result in a potential loss in future earnings in our consolidated statement of operations and a reduction in the fair value of the assets of approximately $46 thousand.

Investment in Non-Marketable Equity Securities

We own investments in non-marketable equity securities without readily determinable fair values. We may value these equity securities based on significant recent arms-length equity transactions with sophisticated non-strategic unrelated investors, providing the terms of these security transactions are substantially similar to the security transactions terms between the investors and us. The impact of the difference in transaction terms on the market value of the portfolio company may be difficult or impossible to quantify.

ITEM 4. CONTROLS AND PROCEDURES

Evaluation of Disclosure Controls and Procedures

We maintain disclosure controls and procedures and internal controls that are designed to provide reasonable assurance that information required to be disclosed in our Exchange Act reports 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 principal executive officer and our principal financial and accounting officer, as appropriate, to allow timely decisions regarding required disclosure.

Our management, including our principal executive officer and our principal financial and accounting officer, evaluated the effectiveness of our disclosure controls and procedures as defined by Rules 13a-15(e) and 15d-15(e) of the Exchange Act. Based on this evaluation and the identification of a material weakness in our internal control over financial reporting, our principal executive officer and our principal financial and accounting officer have concluded that these disclosure controls and procedures were not effective as of March 31, 2022.

Management has concluded that a material weakness in internal control over financial reporting exists related to management's controls over the revenue recognition process in the three months ended March 31, 2022. Specifically, our controls addressing the completeness and accuracy of reports used to calculate product revenue from arrangements subject to overtime revenue recognition did not operate at the proper level of precision to identify material errors. The control deficiency resulted in a material misstatement of revenue related accounts in the current period. Management corrected this misstatement before the financial statements for the three months ended March 31, 2022 were issued. Additionally, management has performed an analysis to ensure no other material errors resulted from this control failure.

Management's Plan to Remediate Material Weakness

We are in the process of developing a detailed plan for remediation of the material weakness, including enhancing management's review controls over revenue and the level of detail and precision applied when reviewing the completeness and accuracy of reports used to determine product revenue for arrangements subject to overtime revenue recognition. We intend to remediate this material weakness as soon as possible, and we will continue to assess the effectiveness of our remediation efforts in connection with our future assessment of the effectiveness of internal control over financial reporting and disclosure controls and procedures. We cannot at this time estimate how long it will take to remediate this material weakness. Until this material weakness is remediated, we plan to continue to perform additional analyses and other procedures to ensure that our consolidated financial statements are prepared in accordance with GAAP.

Changes in Internal Control over Financial Reporting

Other than as described above, there were no changes in our internal control over financial reporting identified in connection with the evaluation required by paragraph (d) of Exchange Act Rules 13a-15 or 15d-15 that occurred during our last fiscal quarter that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting. There were no significant changes to our internal control over financial reporting due to the adoption of new standards.

Inherent Limitations on Effectiveness of Controls

In designing and evaluating the disclosure controls and procedures, management recognizes that any controls and procedures, even if determined effective and no matter how well designed and operated, can provide only reasonable assurance of achieving the desired control objectives to prevent or detect misstatements. In addition, the design of disclosure controls and procedures must reflect the fact that there are resource constraints, and that management is required to apply judgment in evaluating the benefits of possible controls and procedures relative to their costs. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

PART II. OTHER INFORMATION

ITEM 1. LEGAL PROCEEDINGS

We are not currently a party to any material pending litigation or other material legal proceedings.

ITEM 1A. RISK FACTORS

We have included in Part I, Item 1A of our Annual Report on Form 10-K for the year ended December 31, 2021, a description of certain risks and uncertainties that could affect our business, future performance or financial condition (the "Risk Factors"). Other than in respect of the additional risk factor included below, during the three months ended March 31, 2022, there were no material changes from the disclosure provided in the Form 10-K for the year ended December 31, 2021 with respect to the Risk Factors. Investors should consider the Risk Factors prior to making an investment decision with respect to our stock.

We have identified a material weakness in our internal control over accounting related to our product revenue recognition process and such weakness led to a conclusion that our internal control over financial reporting and disclosure controls and procedures were not effective as of March 31, 2022. Our inability to remediate the material weakness, our discovery of any additional weaknesses, and/or our inability to achieve and maintain effective disclosure controls and procedures and internal control over financial reporting could adversely affect our results of operations and our stock price.

Section 404 of the Sarbanes-Oxley Act of 2002 requires that companies evaluate and report on the effectiveness of their internal control over financial reporting. In addition, we regularly engage our independent registered public accounting firm to report on its evaluation of those controls. As disclosed in more detail under Part I, Item 4, "Controls and Procedures" above, we have identified a material weakness in our internal control as of March 31, 2022 related to management's controls over the revenue recognition process. Specifically, our controls addressing the completeness and accuracy of reports used to calculate product revenue from arrangements subject to overtime revenue recognition did not operate at the proper level of precision to identify the errors. Due to the material weakness in our internal control over financial reporting, we have concluded that our disclosure controls and procedures were not effective as of March 31, 2022.

Failure to have effective internal control over financial reporting and disclosure controls and procedures could impair our ability to produce accurate financial statements on a timely basis and could lead to a restatement of our financial statements. If, as a result of the ineffectiveness of our internal control over financial reporting and disclosure controls and procedures, we cannot provide reliable financial statements, our business decision processes may be adversely affected, our business and results of operations could be harmed and investors could lose confidence in our reported financial information. In addition, in some circumstances, failure to maintain effective internal control over financial reporting could result in investigations or sanctions by regulatory authorities.

Our management is taking steps to remediate the material weakness, including enhancing management's review controls over revenue and the level of detail and precision applied when reviewing the completeness and accuracy of reports used to determine product revenue for arrangements subject to overtime revenue recognition. We intend to remediate this material weakness as soon as possible, but we cannot be certain as to when such remediation will be completed, if ever. Additional details regarding the remediation efforts are disclosed under Part I, Item 4, "Controls and Procedures" above. In addition, we may in the future identify additional internal control deficiencies that could rise to the level of a material weakness or uncover other errors in financial reporting. During the course of our evaluation of this material weakness, we may identify areas requiring improvement and may be required to design additional enhanced processes and controls to address issues identified through this review. In addition, there can be no assurance that such remediation efforts will be successful, that our internal control over financial reporting will be effective as a result of these efforts or that any such future deficiencies identified may not be material weaknesses that would be required to be reported in future periods. In addition, we cannot assure you that our independent registered public accounting firm will be able to attest that such internal controls are effective when they are required to do so.

If we fail to remediate the material weakness and maintain effective internal control over financial reporting or disclosure controls and procedures, we may not be able to rely on the integrity of our financial results, which could result in inaccurate or late reporting of our financial results, as well as delays or the inability to meet our reporting obligations or to comply with SEC rules and regulations. Any of these could result in delisting actions by the Nasdaq Stock Market, investigation and sanctions by regulatory authorities, stockholder investigations and lawsuits, and could adversely affect our business and the trading price of our common stock.

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

None.

ITEM 3. DEFAULTS UPON SENIOR SECURITIES

None.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

ITEM 5. OTHER INFORMATION

Not applicable.

ITEM 6. EXHIBITS

3.1	Amended and Restated Certificate of Incorporation of Codexis, Inc. filed with the Secretary of the State of the State of Delaware on April 27, 2010 and effective as of April 27, 2010 (incorporated by reference to Exhibit 3.1 to the Company's Quarterly Report on Form 10-Q for the quarter ended March 31, 2010, filed on May 28, 2010).
3.2	Certificate of Designations of Series A Junior Participating Preferred Stock of Codexis, Inc., filed with the Secretary of State of the State of Delaware on September 4, 2012 (incorporated by reference to Exhibit 3.1 to the Company's Current Report on Form 8-K, filed on September 4, 2012).
3.3	Amended and Restated Bylaws of Codexis, Inc. effective as of April 27, 2010 (incorporated by reference to Exhibit 3.2 to the Company's Quarterly Report on Form 10-Q for the quarter ended March 31, 2010, filed on May 28, 2010).
4.1	Reference is made to Exhibits 3.1 through 3.3.
31.1	Certification of Principal Executive Officer Required Under Rule 13a-14(a) and 15d-14(a) of the Securities Exchange Act of 1934, as amended.
31.2	Certification of Principal Financial Officer Required Under Rule 13a-14(a) and 15d-14(a) of the Securities Exchange Act of 1934, as amended.
32.1	Certification of Principal Executive Officer and Principal Financial Officer Required Under Rule 13a-14(b) of the Securities Exchange Act of 1934, as amended, and 18 U.S.C. §1350.
101	The following materials from the Company's Quarterly Report on Form 10-Q for the quarter ended March 31, 2022, formatted in Inline Extensible Business Reporting Language (iXBRL) includes: (i) Unaudited Condensed Consolidated Balance Sheets at March 31, 2022 and December 31, 2021 (ii) Unaudited Condensed Consolidated Statements of Operations for the Three Months Ended March 31, 2022 and 2021, (iii) Unaudited Condensed Consolidated Statements of Stockholders' Equity for the three months ended March 31, 2022 and 2021, (iv) Unaudited Condensed Consolidated Statements of Cash Flows for the Three Months Ended March 31, 2022 and 2021 and (v) Notes to Unaudited Condensed Consolidated Financial Statements.
101.SCH	Inline XBRL Taxonomy Extension Schema Document
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase Document
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Document
104	The cover page from the Company’s Quarterly Report on Form 10-Q for the quarter ended March 31, 2022, formatted in Inline XBRL and contained in Exhibit 101.

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.

Codexis, Inc.

Date: May 9, 2022

By: /s/ John J. Nicols

John J. Nicols
President and Chief Executive Officer
(principal executive officer)

Date: May 9, 2022

By: /s/ Ross Taylor

Ross Taylor
Senior Vice President and Chief Financial Officer
(principal financial and accounting officer)

Exhibit 31.1

CERTIFICATION

I, John J. Nicols, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Codexis, 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(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

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

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

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

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

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

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

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

Date: May 9, 2022

/s/ John J. Nicols

John J. Nicols

President and Chief Executive Officer
(principal executive officer)

Exhibit 31.2

CERTIFICATION

I, Ross Taylor, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Codexis, 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(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

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

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

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

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

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

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

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

Date: May 9, 2022

/s/ Ross Taylor

Ross Taylor
Senior Vice President and Chief Financial Officer
(principal financial and accounting officer)

Exhibit 32.1

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

In connection with the Quarterly Report of Codexis, Inc. (the "Company") on Form 10-Q for the fiscal quarter ended March 31, 2022, as filed with the Securities and Exchange Commission (the "Report"), John J. Nicols, President and Chief Executive Officer of the Company and Ross Taylor, Senior Vice President and Chief Financial Officer of the Company, respectively, do each hereby certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

- The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and
- The information in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: May 9, 2022

/s/ John J. Nicols

John J. Nicols
President and Chief Executive Officer
(principal executive officer)

/s/ Ross Taylor

Ross Taylor
Senior Vice President and Chief Financial Officer
(principal financial and accounting officer)