UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549
FORM 10-K

(Mark One)

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

For the fiscal year ended: December 31, 2024

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 No.: 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

Securities Registered Pursuant to Section 12(g) of the Act: None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act.	Yes ☐	No	☒
Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act.	Yes ☐	No	☒
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 emerging growth company. See the definitions of "large accelerated filer", "accelerated filer" and "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act:

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

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

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C.7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☐

If securities are registered pursuant to Section 12(b) of the Act, indicate by check mark whether the financial statements of the registrant included in the filing reflect the correction of an error to previously issued financial statements. ☐

Indicate by check mark whether any of those error corrections are restatements that required a recovery analysis of incentive-based compensation received by any of the registrant's executive officers during the relevant recovery period pursuant to §240.10D-1(b). ☐

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

The aggregate market value of voting and non-voting common stock held by non-affiliates of Codexis as of June 30, 2024 was approximately $152.4 million based upon the closing price reported for such date on the Nasdaq Global Select Market.

As of February 24, 2025, there were 82,837,311 shares of the registrant's Common Stock, par value $0.0001 per share, outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's Definitive Proxy Statement to be filed with the Commission pursuant to Regulation 14A in connection with the registrant's 2025 Annual Meeting of Stockholders (the "2025 Proxy Statement"), to be filed subsequent to the date hereof, are incorporated by reference into Part III of this Report. Such Definitive Proxy Statement will be filed with the Securities and Exchange Commission not later than 120 days after the conclusion of the registrant's fiscal year ended December 31, 2024. Except with respect to information specifically incorporated by reference in this Form 10-K, the 2025 Proxy Statement is not deemed to be filed as part of this Form 10-K.

Codexis, Inc.
Annual Report on Form 10-K
For The Year Ended December 31, 2024

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SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

The following discussion and analysis in this annual report on Form 10-K should be read in conjunction with our audited consolidated financial statements and the related Notes that appear elsewhere in this Annual Report on Form 10-K. This Annual Report on Form 10-K contains "forward-looking statements" within the meaning of Section 21E of the Securities Exchange Act of 1934, as amended ("the Exchange Act"), particularly in Part I, Item 1: "Business," Part I, Item 1A: "Risk Factors" and Part II, Item 7: "Management's Discussion and Analysis of Financial Condition and Results of Operations." 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. All statements other than statements of historical fact could be deemed forward-looking, including, but not limited to: any projections of financial information or performance; any statements about historical results that may suggest trends for our business; any statements of the plans, strategies, and objectives of management for future operations; any statements of expectation or belief regarding future events, commercial partnerships, technology developments, our products and product platforms, product sales, revenues, expenses, liquidity, cash flow, commercial reach, market growth rates or enforceability of our intellectual property rights and related litigation expenses; and any statements of assumptions underlying any of the foregoing. 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. Accordingly, we caution you not to place undue reliance on these statements. For a discussion of some of the factors that could cause actual results to differ materially from our forward-looking statements, see the discussion on risk factors that appear in Part I, Item 1A: "Risk Factors" of this Annual Report on Form 10-K and other risks and uncertainties detailed in this and our other reports and filings with the U.S. Securities and Exchange Commission ("SEC"). The forward-looking statements in this Annual Report on Form 10-K represent our views as of the date of this Annual Report on Form 10-K. 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 Annual Report on Form 10-K.

PART I

ITEM 1. BUSINESS

COMPANY OVERVIEW

We are a leading provider of enzymatic solutions for efficient and scalable therapeutics manufacturing, and we leverage our proprietary CodeEvolver® directed evolution technology platform to discover, develop, enhance, and commercialize novel, high-performance enzymes and other classes of proteins. Enzymes are naturally occurring biological molecules critical to almost all biochemical reactions that sustain life. They can be precisely engineered and optimized for specific functions, and to have particular characteristics, such as an ability to survive environments in which natural enzymes cannot, or to perform (bio)chemical transformations different than those for which they naturally evolved. We focus on leveraging our technology and capacity to enhance the properties and performance of enzymes to drive pivotal improvements in manufacturing of complex therapeutics across two key focus areas: our foundational, revenue-generating pharma biocatalysis business and our Enzyme-Catalyzed Oligonucleotide Synthesis™ ("ECO Synthesis™") manufacturing platform, which is comprised of enzymatic tools, and processes, designed to enable large-scale manufacture of RNA interference ("RNAi") therapeutics. In July 2023, we announced that we discontinued investment in certain development programs, primarily in our novel biotherapeutics business segment. As part of this strategic prioritization, during 2024 we completed the divestiture and monetization of certain biotherapeutics assets as well as certain non-core life science assets, including in genomics and next generation sequencing applications.

In our revenue-generating pharma biocatalysis business (formerly our pharmaceuticals manufacturing business), we utilize our CodeEvolver technology platform to develop optimized enzymes that are used by some of the world's largest pharmaceutical companies to improve the efficiency and productivity of their manufacturing processes for small molecule therapeutics. Our unique enzymes drive improvements such as higher yields, increased purity, reduced energy usage and waste generation, all of which lead to improved efficiency and reduced costs in small-molecule manufacturing.

We also use the CodeEvolver platform technology to develop enzymes for the synthesis of RNAi therapeutics through our ECO Synthesis manufacturing platform, where our enzymes are poised to deliver many of the same benefits we offer in pharma biocatalysis across purity, yield, and improved manufacturing efficiency. In November 2024, we presented data at the TIDES EU conference demonstrating the successful end-to-end enzymatic synthesis of an entire commercially approved small interfering ribonucleic acid ("siRNA") therapeutic asset with the ECO Synthesis manufacturing platform. In addition to using full enzymatic sequential synthesis, adding one nucleotide at a time to synthesize the two strands from beginning to end, we demonstrated synthesis of the same siRNA asset using three other routes utilizing enzymatic ligation with our double-stranded RNA ("dsRNA") ligase, which can stitch together fragments of chemically and/or enzymatically synthesized RNA to form the full siRNA drug structure. For the three other routes, our data highlighted that full-length oligos of equal quality and yields were obtained whether the fragments were made with enzymes or by traditional phosphoramididte chemistry. At the end of 2024, we completed the build out of our ECO Synthesis Innovation Lab, a facility that uses our ECO Synthesis manufacturing platform to synthesize gram-scale quantities of a customer's desired siRNA construct suitable for pre-clinical testing. In addition, it allows us to provide process development, analytical method development and other manufacturing process optimization which is required before the siRNA enters clinical-stage manufacturing and testing. In 2025, we expect to manufacture good laboratory practice ("GLP")-grade siRNA for customers in our Innovation Lab under development services contracts model, and we anticipate entering a partnership with a large-scale contract development and manufacturing organization ("CDMO") to use our ECO platform of enzymatic tools and processes to synthesize good manufacturing practices ("GMP")-grade siRNA drug substance for our customers. We expect to expand our enzymatic tools and process offerings as we further enhance the ECO Synthesis platform to address the overall market needs for scalable and sustainable RNAi manufacturing.

History and Core Technology

We are a pioneer in harnessing computational technologies to drive biology advancements. Since 2002, we have made substantial investments in the development of our proprietary CodeEvolver technology platform, the primary source of our competitive advantage for our business. The CodeEvolver technology platform has the power to transform the performance of an enzyme, tailoring it for a specific application and/or process. Using powerful machine learning tools and sophisticated molecular, cellular, and bioanalytical workflows, we design and screen libraries of thousands of variants every few weeks. Content-rich libraries screened under real-world conditions can yield dense and valuable datasets, which when data-mined effectively enables us to optimize multiple parameters in parallel. The resulting evolved variants often have a combination of enhanced properties, such as increased activity, specificity, and stability under desired conditions, or improved manufacturability in the production host. These enhanced properties provide differentiated technical performance in the target application and can provide our customers increased value in the commercial deployment of their products.

Key Strategic Focus Areas

We provide enzyme-based solutions to our clients that address complex therapeutic manufacturing challenges in the areas of pharma biocatalysis and RNAi manufacturing. Both areas overlap in the technical enzyme engineering expertise required and also include similar potential customers. Many of our longstanding pharma biocatalysis customers are currently investing in both pharma biocatalysis for the development of small-molecule therapeutics and in the development of RNAi therapeutics, providing us a unique advantage in terms of our commercial reach. Further, our pharma biocatalysis business establishes credibility for the ECO Synthesis manufacturing platform by demonstrating our proven history of engineering technically complex enzymes for large pharmaceutical companies and effectively scaling up to multiple metric tons of manufactured product using our existing platforms.

Pharma Biocatalysis

We believe the pharmaceutical industry represents a significant market opportunity for our enzymes as pharmaceutical companies constantly developing new small molecule drugs and are under significant competitive pressure both to improve manufacturing efficiencies and to increase the speed to market for their products. To address these pressures, pharmaceutical companies are driven to identify reliable, cost-effective, and sustainable manufacturing processes to produce both their new drug candidates and their existing products, while not impacting drug safety and efficacy. Manufacturing economies of scale are increasingly important to our pharmaceutical customers as they get closer to their commercial drug launch. Over the lifecycle of the drug, market pressures further intensify as pharmaceutical companies lose their patent exclusivities and begin to experience competition from generic manufacturers of their products.

Many of our customers are large global pharmaceutical companies who partner with us to develop engineered enzymes for use as biocatalysts, meeting precisely defined criteria. Their goals are to improve the efficiency, productivity and sustainability of their manufacturing processes.

As of December 31, 2024, we sell enzymes as biocatalysts to pharmaceutical manufacturers for 16 therapeutic drugs that are currently approved for commercial sales.

We currently sell these enzymes, that have already been engineered and installed in a customer's commercial manufacturing process at multi-kilograms to metric tons per annum scale. For example, we sell enzymes to Merck, Sharp & Dohme ("Merck") for their manufacture of sitagliptin, the active ingredient in JANUVIA, to Urovant Sciences GmbH ("Urovant") and KYORIN Pharmaceutical Co., Ltd. ("Kyorin") for the manufacture of vibegron, the active ingredient in Urovant's GEMTESA and Kyorin's BEOVA products for the treatment of overactive bladder, as well as supporting other products and customers for which public disclosures have not been made.

In addition to these larger volumes of enzymes that are sold for our customers' ongoing commercial requirements, we also sell smaller quantities of engineered enzymes for use in a customer's clinical-stage manufacturing. As of December 31, 2024, Codexis is selling enzymes to pharmaceutical manufacturers for 14 drug candidates currently in Phase 2 and Phase 3 clinical trials, or to customers working to convert to an enzymatic manufacturing process for drugs that have been commercially approved. We are focused on expanding this pipeline to ensure our ability to grow this business over time.

Finally, we also sell even smaller quantities of enzymes (typically grams to multi-kilogram scale) to customers for manufacturing and testing in their discovery and pre-clinical phase.

In addition to the sale of enzymes, we also offer contracted research and development partnerships to our customers. These research and development activities are typically governed by collaboration agreements, which often contain research and development fees and intellectual property provisions, under which we screen and/or engineer enzymes for customers in connection with their process development efforts. In these collaborations, we typically receive consideration in the form of one or more of the following: upfront payments, milestone payments, payments for screening and engineering, followed by fees for manufacturing scale-up and supply of enzymes, licensing fees and/or royalties as the customer's product commercializes.

We also have licensed our CodeEvolver technology platform to pharmaceutical companies to help them develop custom-designed enzymes that are highly optimized for efficient manufacturing processes. To date, we have entered into platform technology licensing agreements with each of GlaxoSmithKline Intellectual Property Development Limited, a subsidiary of GlaxoSmithKline plc ("GSK"), Merck & Co., Inc. ("Merck & Co") and Novartis Pharma AG ("Novartis").

ECO Synthesis Manufacturing Platform

ECO Synthesis Overview

A key strategic priority for Codexis is the advancement and commercialization of our ECO Synthesis manufacturing platform, which is designed to enable the commercial scale manufacture of RNAi therapeutics. As of December 31, 2024, there are six approved siRNA therapeutics on the market in the United States, primarily targeting rare orphan disease indications. However, there are more than 450 RNAi therapeutic assets in development, including over one hundred that are in Phase 2 and Phase 3 clinical trials, with more than 40 of these targeting large disease indications such as Alzheimer's, hyperlipidemia and hypertension. We expect worldwide demand for RNAi therapeutics to grow significantly as RNAi therapeutic assets progress through clinical development and are commercially approved.

The current industry standard for manufacturing RNAi therapeutics is a well-established, chemical-based method commonly called solid-phase oligonucleotide synthesis ("SPOS") utilizing phosphoramidite chemistry. This approach has existed for more than forty years and works effectively for small-scale manufacturing required during the discovery stage of clinical development. However, SPOS and phosphoramidite chemistry face multiple limitations in the context of commercial-scale manufacture of RNAi therapeutics. This approach requires significant infrastructure and capital investment to meet the anticipated future growth in demand for RNAi therapeutics. SPOS and phosphoramidite chemistry are also currently limited to single-digit kilogram synthesis batch sizes, which presents challenges around quality control and scalability. Further, chemical synthesis requires large volumes of acetonitrile, a highly-flammable, organic solvent with high waste disposal costs, to facilitate the reaction environment necessary to produce RNAi therapeutics. As additional RNAi therapeutic candidates are approved for large disease indications, we believe using traditional SPOS and phosphoramidite chemical synthesis for commercial scale production will become prohibitively expensive, time-intensive, and challenging for many drug developers seeking to produce enough drug substance to address patient indications that require dosing more than 1 million patients annually.

We believe that the ECO Synthesis manufacturing platform presents several advantages to potentially address the limitations of SPOS and phosphoramidite chemistry. First, the platform is being developed to integrate within existing manufacturing facilities and utilizes equipment currently available in the industry, potentially eliminating much of the infrastructure investment required for commercial scale manufacturing of RNAi therapeutics with phosphoramidite chemistry. The ECO Synthesis manufacturing platform is also being designed to manufacture tens to hundreds of kilograms of high-purity RNA per synthesis batch, with a closed-loop system intended to increase volumetric reagent efficiency which enables large batch synthesis. Finally, our process is aqueous based, potentially mitigating the need for high volumes of acetonitrile, significantly decreasing chemical waste streams, and reducing heavy disposal and purification costs.

At the TIDES Europe meeting in November 2024, we presented data in a joint poster presentation with Bachem, one of the world's leading CDMOs in oligonucleotide manufacturing, the data provided compelling external validation of the superior performance of our engineered dsRNA ligases over the wild type enzymes in use today across both volumetric productivity and substrate versatility. We also announced we completed a proof-of-concept technical collaboration with a major siRNA drug innovator, where we synthesized their desired oligonucleotide fragments using our enzymatic process.

ECO Synthesis Innovation Lab

We completed the build-out of our ECO Synthesis Innovation Lab at the end of 2024. This facility allows us to optimize the development and scaling of a specific manufacturing process of a customer's specific siRNA asset before completing the technology transfer to a CDMO partner for bulk GMP-grade production of drug substance to supply the customer's clinical trials and eventual commercialization. It is also designed to enable the manufacture of GLP-grade RNAi therapeutic material in sufficient quantities to support customers' preclinical development.

The ECO Synthesis manufacturing platform is a set of enzymatic tools and processes that are used together to manufacture siRNA. With this platform, we work with our customers to optimize the manufacturing of the customer's asset. This platform allows us to use enzymatically synthesized RNAi sequences, to conjugate tissue targeting moieties such as GalNAc, onto an RNA strand, which is a common modification included on RNAi therapeutics to assist with targeted tissue delivery and to ligate (connect) RNAi sequences together. All of these capabilities are used to create a full-length and completed RNAi therapeutic asset.

Our goal is to be a value-added service provided to pharmaceutical innovators. Many of our potential clients seek expertise in areas that they cannot develop on their own, but seek to partner with companies who provide expertise in manufacturing. Through our ECO Synthesis platform, we offer a true partnership approach to drug manufacturing. The services we provide include:

- *Method Development and Analytics:* Customers require qualified methods to measure and ensure purity of their siRNA construct before going into the clinic.
- *Manufacturing*. Process development and optimization are necessary to produce GLP material of a customer's siRNA asset for preclinical testing prior to filing an IND and entering the clinic. We provide these services through our ECO Synthesis Innovation Lab. We are exploring expanding our services to include GMP manufacturing, which would enable us to provide clinical grade material to our clients for at least Phase 1 clinical studies.
- Ongoing Support. We offer ongoing regulatory and Chemistry, Manufacturing and Controls ("CMC") documentation throughout preclinical studies and clinical trials to support our clients' regulatory filings and interactions with the United States Food and Drug Administration ("FDA").

Potential Commercial Opportunity of RNAi Manufacturing

We believe we have significant competitive advantages to successfully enter RNAi manufacturing with our proprietary ECO Synthesis manufacturing platform, largely stemming from synergies with our pharma biocatalysis expertise in terms of technical knowledge and commercial reach. Many of our current customers are also developing RNAi therapeutics. We believe their familiarity with our ability to engineer and scale complex enzymes is a significant commercial advantage for our ECO Synthesis manufacturing platform. However, there are also key differences that make this platform a compelling opportunity as compared to our existing pharma biocatalysis business. Pharma biocatalysis generally requires one-to-one custom enzyme engineering projects, which involve significant time and resource investment from Codexis. Our top five selling pharma biocatalysis enzymes in 2024, excluding sales of CDX-616 to Pfizer Inc. ("Pfizer") related to PAXLOVID, generated on average between $2.0 million to $9.0 million annually per enzyme between 2021 and 2024. By contrast, the ECO Synthesis manufacturing platform could be applicable to many pharmaceutical and CDMO customers and has the potential to manufacture multiple different RNAi therapeutic assets with the same of enzymes and processes. Further, the potential scalability of our solution is differentiated from phosphoramidite chemistry, which is limited in batch size and requires high volumes of toxic solvent. We believe that the ECO Synthesis manufacturing platform could enable CDMOs and drug developers to scale production of RNA therapeutics with significantly less capital expenditure for infrastructure capacity and as a result, could potentially command significantly better economic terms than the current annual revenues for pharma biocatalysis enzymes.

Our business model for the ECO Synthesis manufacturing platform is centered around selling contract development and manufacturing services delivered through the ECO Synthesis Innovation Lab. These activities are typically governed by development agreements which include fees for process development, process optimization, analytical method development and qualification, CMC documentation and small-scale manufacturing of siRNA drug substance.

Other Differentiated Enzymes

In addition to RNAi manufacturing and pharma biocatalysis applications, we have also applied our CodeEvolver technology platform to develop customized enzymes for customers using across other molecular biology applications, such as template dependent mRNA manufacturing, next generation sequencing, diagnostic testing and DNA oligonucleotide synthesis.

In June 2020, we entered into a co-marketing and enzyme supply collaboration agreement with Alphazyme LLC ("Alphazyme") for the production and co-marketing of enzymes for life science applications. This collaboration enabled the commercialization of Codex HiFi DNA Polymerase, Codex HiFi Hot Start DNA Polymerase, Codex HiFi Hot Start 2X NGS Mix, Codex HiCap RNA Polymerase, Codex HiFi UL DNA Polymerase, and Codex HiTemp Reverse Transcriptase. In September 2024, we entered into a new non-exclusive commercial and manufacturing license agreement with Alphazyme (terminating the prior agreement), including licenses for the Codex HiFi DNA Polymerase, Codex HiTemp Reverse Transcriptase, Codex HiRev Isothermal Polymerase and other enzymes that were in development directed towards genomics and diagnostics applications prior to our strategic shift announced in July 2023. Under the terms of the agreement, we are eligible to receive sales-based royalties.

In June 2020, we entered into a Master Collaboration and Research Agreement with Molecular Assemblies, Inc. ("MAI") (the "MAI Agreement"), and between June 2020 and April 2022, we leveraged our CodeEvolver technology platform to improve the DNA polymerase enzymes that are critical for enzymatic DNA synthesis. At the time we entered into the MAI Agreement, we purchased $1.0 million in MAI's Series A financing. In August 2022, we and MAI announced that we had entered into a Commercial License and Enzyme Supply Agreement with MAI (the "MAI Supply Agreement") under which Codexis shall manufacture and supply to MAI an enzyme engineered under the MAI Agreement for use in a specific field. Between 2020 and 2024, in connection with the execution of the MAI Agreement and via separate purchases, we acquired shares of MAI's Series A and B preferred stock. On January 28, 2025, Maravai LifeSciences, Inc. ("Maravai"), a global provider of life science reagents and services to researchers and biotech innovators, announced its acquisition of intellectual property and relevant assets from MAI. In January 2025, MAI assigned the MAI Supply Agreement to Maravai in connection with the sale of its related assets to Maravai.

In March 2022, we entered into a Stock Purchase Agreement with seqWell, Inc. ("seqWell"), a privately held life sciences company, pursuant to which we purchased 1,000,000 shares of seqWell's Series C preferred stock for $5.0 million. In March 2023, we entered into a Master Collaboration Agreement and Research Agreement with seqWell (the "seqWell Agreement"), pursuant to which we provided research and experimental screening and enzyme engineering activities in exchange for compensation in the form of additional shares of seqWell's common stock. We received 205,279 shares of seqWell's common stock from research and development services with seqWell in the year ended December 31, 2023. In addition to our initial equity investment and the shares we have received under the seqWell Agreement, in September 2023, we purchased an additional 88,256 shares of seqWell's Series C-1 preferred stock and 44,128 common stock warrants for $0.4 million. In line with our strategy relating to non-core Life Sciences assets, in January 2025 we sold assets that were developed under the seqWell Agreement to seqWell in exchange for the right to receive a cash payment upon future events and a warrant to purchase seqWell's common stock exercisable upon future events, and terminated the seqWell Agreement.

In December 2023, we entered into an exclusive licensing agreement with Aldevron LLC ("Aldevron"), a global leader in the custom development and manufacture of plasmid DNA, RNA and proteins for the biotech industry, whereby Aldevron licensed our Codex HiCap RNA Polymerase. Under the terms of the deal, Aldevron received global manufacturing and commercialization rights to the Codex HiCap RNA Polymerase in exchange for payments for near-term technical milestones, along with commercial milestones and sales-based royalties for research use only material as well as GMP material.

In December, 2024, we entered into a license agreement whereby Pfizer obtained a license to make a specific Codexis enzyme for use in the manufacture of Pfizer's products. As part of the agreement, Pfizer utilized remaining credit from a supply agreement between the parties toward the upfront fee. Under the terms of the license agreement, Codexis is eligible to receive development and sales-based milestone payments based upon the future use of the enzyme in drug substance manufacturing.

Licensing Our CodeEvolver Directed Evolution Technology Platform

Novartis

In May 2019, we entered into a Platform Technology Transfer and License Agreement (the "Novartis CodeEvolver Agreement") with Novartis. The Novartis CodeEvolver Agreement allows Novartis to use our proprietary CodeEvolver platform technology in the field of human healthcare.

Under the terms of the Novartis CodeEvolver Agreement, we granted Novartis a worldwide license to use certain patents, patent applications and know-how from our CodeEvolver technology platform to research, develop and manufacture novel enzymes for use by or on behalf of Novartis as biocatalysts in the chemical synthesis of small molecule and bioconjugate APIs. The license is exclusive for the research, development and manufacture of novel enzymes for use by Novartis as biocatalysts in the chemical synthesis of API owned or controlled by Novartis ("Novartis Exclusive Field") and non-exclusive for the research, development and manufacture of novel enzymes for use by Novartis in the chemical synthesis of API not owned or controlled by Novartis or any third party ("Novartis Non-Exclusive Field").

In July 2021, we announced the completion of the technology transfer period during which we transferred our proprietary CodeEvolver technology platform to Novartis (the "Technology Transfer Period").

Pursuant to the Novartis CodeEvolver Agreement, we received an upfront payment of $5.0 million shortly after the effective date. We completed the second technology milestone transfer under the agreement and received a milestone payment of $4.0 million in 2020. We have also received an aggregate of $5.0 million for the completion of the third technology transfer 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 (the "Improvements Term"), Novartis will pay us annual payments over four years which amount to an additional $8.0 million in aggregate. We also have 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 technology platform during the period beginning on the conclusion of the Technology Transfer Period and ending on the expiration date of the last to expire licensed patent. These product-related usage payments, if any, will be paid by Novartis to Codexis for each quarter that Novartis manufactures API using a CodeEvolver-developed enzyme.

The licenses to Novartis are granted under patents, patent applications and know-how that Codexis owns or controls as of the effective date of the Novartis CodeEvolver Agreement and that cover the CodeEvolver technology platform. Any improvements to the CodeEvolver technology platform during the Technology Transfer Period will also be included in the license grants from Codexis to Novartis.

Biotherapeutics Divestitures

Our biotherapeutic product candidates, which were in clinical and preclinical development, were discovered using our proprietary CodeEvolver technology platform and ranged from orally delivered enzymes to engineered transgenes for delivery as gene therapies. The most advanced of our biotherapeutics programs was CDX-7108, a potent lipase intended for use as a potential treatment for exocrine pancreatic insufficiency ("EPI"), which was being developed under a Strategic Collaboration Agreement with Nestlé Health Science ("Nestlé") (the "Nestlé SCA"). As part of the Nestlé SCA and a related development agreement, we and Nestlé completed a Phase 1 clinical trial of CDX-7108. In December 2023, we entered into an acquisition agreement with Nestlé (the "Acquisition Agreement"), pursuant to which we agreed to assign our interests in CDX-7108 (including associated agreements and intellectual property rights) to Nestlé and terminate the Nestlé SCA and development agreement. Under the terms of the Acquisition Agreement, Nestlé is solely responsible for the continued development and commercialization of CDX-7108, including all associated costs, with Codexis retaining an economic interest in the program through an upfront payment, future potential milestone payments and net-sales based royalties.

In addition, we used our CodeEvolver technology platform to engineer a series of transgenes that code for enzymes that may be used as gene therapies to treat rare lysosomal storage disorders, such as Fabry Disease and Pompe Disease, as well as a blood factor disorder, with Takeda Pharmaceutical Co. Ltd. ("Takeda"). In April 2023, Takeda discontinued its efforts in adeno-associated virus ("AAV") gene therapy, including these development programs.

In July 2024, we entered into an asset purchase agreement with Crosswalk Therapeutics ("Crosswalk") for our investigational Fabry and Pompe disease compounds, both of which were previously part of our collaboration agreement with Takeda. Under the terms of the agreement with Crosswalk, we are eligible to receive future development and commercial milestone payments in addition to a low-to-mid single-digit percentage net sales-based royalty.

Additionally, in April 2024 we entered into an asset acquisition agreement with another private biotherapeutics company under which we divested assets related to our investigational homocystinuria and maple syrup urine disease programs, and in June 2024, we entered into an asset sale agreement under which we divested assets related to our programs for the GLB1, GBM1, and SGSH genes, and our investigational AAV capsid technology. Under these agreements, Codexis is eligible to receive milestone and earnout payments.

OUR STRATEGY

Our strategy is to grow our revenues, profits, and stockholder value by selling customized enzymes and providing services from our ECO Synthesis platform. We intend to monetize our technology in the following ways:

- *Growing our foundational revenue-generating pharma biocatalysis business.* We intend to pursue opportunities in the pharmaceutical market to use our enzymes to improve the manufacturing efficiencies for the production of small-molecule drugs. We intend to increase the number of pharmaceutical customers and products that utilize and benefit from our novel, enabling engineered enzymes.
- *Developing and commercializing our ECO Synthesis manufacturing platform for use in RNAi manufacturing*. We intend to enable customers to manufacture RNAi therapeutics at commercial scale. This also includes a hybrid ligation approach using our dsRNA ligase, a completely enzymatic route, and the development of enzymes and processes to enable the manufacture of building blocks, starter materials, and targeting moieties. We intend to increase the number of customers utilizing our ECO Synthesis manufacturing platform by providing development and manufacturing services through our ECO Synthesis Innovation Lab.

- *Monetizing non-core assets and leveraging channel partners with strong commercial reach to drive penetration of other developed, non-core enzymes.* Consistent with our strategy to focus on programs that we believe have the strongest probability of creating significant value in the near-term and beyond, we have monetized non-core assets and are leveraging channel partners with stronger commercial reach to drive penetration of other developed, non-core enzymes. Examples of this strategy include monetizing CDX-7108 through the purchase agreement with Nestlé and the exclusive licensing agreement with Aldevron for our Codex HiCap RNA Polymerase, both of which were announced in December 2023, as well as the exclusive licensing agreement with Roche in February 2024 for the newly engineered DNA ligase, the non-exclusive license with Alphazyme in September 2024 for a portfolio of our life sciences enzymes, and the purchase agreement for transposase with seqWell executed in January 2025.

- *Advancement of our CodeEvolver platform to maintain leadership in enzyme engineering*. We leverage our proprietary CodeEvolver directed evolution technology platform to discover, develop, enhance, and commercialize novel, high-performance enzymes for the manufacturing of complex therapeutics. We intend to maintain technology leadership in enzyme engineering through continued investments in data science, computational biology, and laboratory operational efficiency to maintain our primary source of competitive advantage.

INTELLECTUAL PROPERTY

Our success depends in large part on our ability to protect our proprietary technology, products and services under patent, copyright, trademark and trade secret laws. We also rely heavily on confidentiality and non-disclosure and other contractual agreements for further protection of our proprietary technology, products and services. Protection of our proprietary rights, titles and interests is important for us to offer our customers and partners proprietary technology, products and services that are not available from our competitors, and to exclude our competitors from practicing technology that we have developed or exclusively licensed from other parties. For example, our ability to successfully supply innovator pharmaceutical manufacturers as customers depends on our ability to supply proprietary enzymes or methods for making pharmaceutical intermediates or APIs that are not available from our competitors. Likewise, in the generic pharmaceutical area, protection of our proprietary technology, products and services directed to our enzymes and methods of producing pharmaceutical products, through patent or trade secret laws or other legal protections is important for us and our customers to maintain a lower cost production advantage over competitors.

As of December 31, 2024, we owned or controlled approximately 1,760 active issued patents and pending patent applications in the United States and in various foreign jurisdictions, many of which are directed to our enabling technologies and specific methods and products that support our business in the pharmaceutical and oligonucleotide synthesis markets. This portfolio also includes patents and pending patent applications in the biotherapeutics, molecular diagnostics, and other markets. As of December 31, 2024, our patents and pending patent applications, if issued, have terms that expire between 2025 and approximately 2045. Our United States ("U.S.") patents and pending patent applications directed to the CodeEvolver technology platform developed internally by us have terms that expire between 2029 and approximately 2034. It is possible that some U.S. patents and patent applications (if issued) may be entitled to patent term extensions and/or patent term adjustments, which would extend the protection beyond these expiration dates. It is also possible that some patents and patent applications (if issued) in other jurisdictions will be entitled to additional patent terms. Our current intellectual property rights also include patents, trademarks, copyrights, software and certain assumed contracts that we acquired from Maxygen, Inc. ("Maxygen") in October 2010, which are associated with directed evolution technology, known as the MolecularBreeding technology platform developed by Maxygen. The intellectual property rights and other related assets that we acquired from Maxygen continue to be subject to existing exclusive and non-exclusive license rights granted by Maxygen to third parties. We continue to file new patent applications in our business areas of interest, for which terms generally extend 20 years from the non-provisional filing date in the United States.

As of December 31, 2024, we owned approximately 70 trademark registrations in the United States and foreign jurisdictions, as well as various common law trademarks. These include, but are not limited to: Codexis, Codex, CodeEvolver, MOSAIC, SAGE, MicroCYP, MCYP, ProSAR, Unlock the Power of Proteins, the Codexis Protein Engineering Experts logo, Strategist, Continuity, Ameli, Forager, Analogene, Harvester, Atoms, Riptide, APS and a Codexis design mark (i.e., the stylized Codexis logo), as well as pending registration applications for ECO Synthesis and ecoRNA.

COMPETITION

We face differing forms of competition in pharmaceutical biocatalysis and RNAi therapeutics manufacturing, as set forth below.

Pharma Biocatalysis

We market our enzyme biocatalyst products and services to manufacturers of small molecule pharmaceutical intermediates and APIs. Our primary competitors in that market are companies marketing either conventional, non-enzymatic catalysts or alternative biocatalyst products and services, or from full-service CDMOs offering conventional chemistry and biocatalytic approaches to the production of APIs. We also face competition from existing in-house technologies (both biocatalysis and conventional chemistries) within our client and potential client companies. The principal methods of competition and competitive differentiation in this market are price, product quality and biocatalyst performance, including manufacturing yield, safety and environmental benefits and speed of product delivery. Pharmaceutical manufacturers that use biocatalytic processes can face competition from manufacturers that use more conventional processes and/or manufacturers that are based in regions (such as India and China) with lower operating, regulatory, safety and environmental costs.

We also compete with companies developing and marketing conventional catalysts including, for example, Solvias AG, BASF, Johnson-Matthey and Takasago International Corporation.

The market for supplying enzymes for use in pharma biocatalysis is fragmented. There is competition from large industrial enzyme companies, as well as subsidiaries of larger contract research/contract manufacturing organizations, such as DSM Firmenich, Cambrex Corporation, Lonza, WuXi STA and Almac Group Ltd. Some fermentation pathway design companies, such as Ginkgo Bioworks, whose traditional focus has been to design microorganisms that express small molecule chemicals, could extend into designing organisms that express enzymes. There is also competition in the enzyme customization and optimization area from several smaller companies, such as BRAIN AG, evoxx technologies GmbH, c-LEcta GmbH, Enzymicals AG, and Enzymaster.

The market for the manufacture and supply of APIs and intermediates is large, with many established companies. These companies include many of our large innovator and generic pharmaceutical customers, such as Merck, GSK, Novartis, Pfizer, Bristol-Myers Squibb Company ("Bristol-Myers"), Kyorin, Urovant, and Teva Pharmaceutical Industries Limited ("Teva"), which have significant internal research and development efforts directed at developing processes to manufacture APIs and intermediates for use in their drug product manufacturing. There is also a large network of CDMOs servicing the innovator companies with supply of APIs and/or intermediates. These C(D)MOs include Cambrex Corporation, Asymchem, WuXi STA and Almac Group Ltd, among many others. The processes used by these companies (both C(D)MOs and innovators) include classical organic chemistry reactions, chemo-catalytic reactions, biocatalytic reactions or combinations thereof. Our biocatalyst-based manufacturing processes must compete effectively on cost and efficiency with these internally developed routes.

We believe that our principal advantage is our ability to rapidly deliver customized enzymes for existing and new intermediates and APIs in the pharma biocatalysis market. This capability has allowed us to create a breadth of enzymes with improved performance characteristics including, for example, better activity, stability, and activity on a range of substrates, compared to traditional chemistry-based manufacturing processes and naturally occurring (and thus not optimized) biocatalysts. We believe that our CodeEvolver technology platform can provide substantially superior results, in shorter time frames, than companies offering competing enzyme development services.

ECO Synthesis Manufacturing Platform for RNAi Therapeutics

We market our ECO Synthesis manufacturing platform and contract development services through our ECO Synthesis Innovation Lab to drug sponsors developing RNAi therapeutics. SPOS using phosphoramidite chemistry is the current and long-established industry standard for the manufacture of RNAi therapeutics, examples including antisense oligonucleotides, siRNA, RNA aptamers, and guide RNA. CDMOs in this space, such as Agilent Technologies, have made significant capital investment to expand their RNA manufacturing capabilities using phosphoramidite chemistry. In addition, CDMOs and large pharmaceutical companies are seeking to make incremental improvements to phosphoramidite chemistry, including the development of ligation-based approaches, liquid-phase synthesis, and solvent recycling technologies. However, many drug developers and CDMOs are already exploring the use of enzymatic technology, including our dsRNA ligase, in their manufacturing processes due to the potential benefits around increased yield, purity, and efficiency. Additionally, there are opportunities for us to collaborate with CDMO partners to enable the manufacture of siRNA material at a greater scale than is currently possible within Codexis facilities. In 2025, we anticipate signing and announcing a CDMO scale-up partnership to provide a path to enzymatically synthesized GMP-grade siRNA material to drug developer customers in the near term.

There are also multiple early-stage competitors who are pursuing fully enzymatic approaches to the manufacture of RNA, including EnPlusOne Biosciences, a private startup company, and a UK-based consortium led by the Centre for Process Innovation ("CPI") and consisting of multiple academic and research organizations, including The University of Manchester and large pharmaceutical companies, including AstraZeneca plc and Novartis.

Core Technology

We are a leader in the field of enzyme engineering to create novel enzymes, and our work across pharma biocatalysis and the ECO Synthesis manufacturing platform relies on our core technology. We are aware that other companies, organizations and persons have developed technologies that appear to have some similarities to our patented proprietary technologies. For example, we are aware that other companies, including Ginkgo Bioworks, BRAIN, and Enzymicals AG, have alternative methods for obtaining and generating genetic diversity or use mutagenesis techniques to produce genetic diversity. Some companies, including Biomatter Designs, Arzeda, and Enzymaster, leverage predictive computational algorithms to guide enzyme engineering efforts. In addition, academic institutions such as the California Institute of Technology, University of Washington, University of Manchester, and the Austrian Centre of Industrial Biotechnology are also working in this field. This field is highly competitive with companies and academic and research institutions actively seeking to develop technologies that could be competitive with our technologies.

Technological developments by others may result in our products and technologies, as well as products manufactured by our customers using our biocatalysts, becoming obsolete. We monitor publications and patents that relate to directed molecular evolution, as well as computational design and modeling tools, to be aware of developments in the field and evaluate appropriate courses of action in relation to these developments.

Many of our competitors have substantially greater manufacturing, financial, research and development, personnel and marketing resources than we do. As a result, our competitors may be able to develop competing and/or superior technologies and processes, and compete more aggressively and sustain that competition over a longer period of time than we could. Our technologies and products may be rendered obsolete or uneconomical by technological advances or entirely different approaches developed by one or more of our competitors.

CUSTOMERS

We rely on certain key customers for a significant portion of our total revenues and our accounts receivable balances. For the year ended December 31, 2024, four customers accounted for approximately 18%, 13%, 10%, and 10% of our total revenues. As of December 31, 2024, four customers accounted for approximately 18%, 16%, 12%, and 10% of our accounts receivable balances. For more information, see Note 15, "Segment, Geographical and Other Revenue Information" in the Notes to the Consolidated Financial Statements set forth in Item 8 of this Annual Report on Form 10-K.

OPERATIONS

Our corporate headquarters are located in Redwood City, California and provide general administrative support to our business and are the center of our research, development and business operations. We have limited internal manufacturing capacity at our headquarters in Redwood City. For our pharma biocatalysis business, we expect to rely on third-party manufacturers for commercial production of our biocatalysts for the foreseeable future. Our in-house manufacturing is dedicated to producing both Codex biocatalyst panels and kits and enzymes for use by our customers in pilot scale and clinical production. We also supply initial commercial quantities of biocatalysts for use by our collaborators to produce pharmaceutical intermediates and manufacture biocatalysts that we sell. For the ECO Synthesis manufacturing platform, our ECO Synthesis Innovation Lab is located within our corporate headquarters and is designed to supply GLP-grade material in sufficient quantities to support customers' preclinical development. We expect to partner with one or more CDMOs for bulk GMP-grade siRNA production to supply customers' clinical trials and beyond in the near-term.

In September 2023, we announced that we had entered into an agreement for the assignment and assumption of lease for our San Carlos, California facility. In the first quarter of 2021, we entered into an arrangement to lease this facility to serve as an additional office and research and development laboratory space which we occupied beginning December 2021. As part of the restructuring of our business announced in July 2023, we consolidated operations to our Redwood City headquarters and discontinued investment in biotherapeutics. For additional information on the San Carlos facility, see Note 13, "Commitments and Contingencies" in the Notes to the Consolidated Financial Statements set forth in Item 8 of this Annual Report on Form 10-K.

Our research and development operations include efforts directed towards engineering biocatalysts, bioprocess development, cellular engineering, biocatalyst screening, metabolites, strain improvement, fermentation development and process engineering. We conduct enzyme evolution, enzyme production development, microbial bioprocess development, cellular engineering, microbial evolution and process engineering evaluations and design primarily at our headquarters in Redwood City, California. Manufacturing of our enzymes is conducted primarily in four locations: at our in-house facility in Redwood City, California and at third-party contract manufacturing organizations ("CMOs"): Lactosan GmbH & Co. KG ("Lactosan") in Kapfenberg, Austria, ACS Dobfar S.p.A. ("ACSD") (formerly known as DPhar S.p.A.) in Anagni, Italy, and Sekisui Diagnostics (UK) Ltd. ("Sekisui") in Maidstone, United Kingdom. Generally, we perform smaller scale manufacturing in-house and outsource larger scale manufacturing, representing a large percentage of our production of novel enzymes, to CMOs.

GOVERNMENT REGULATION

Our enzymes are used by pharmaceutical and biopharmaceutical companies in the manufacture of their drug or biologic product candidates and finished products. In the United States, the manufacture, distribution, marketing, and sale of drug products and the provision of certain services for development-stage pharmaceutical and biotechnology products are subject to extensive ongoing regulation by the United States Food and Drug Administration ("FDA"), the United States Department of Health and Human Services ("HHS"), the Centers for Medicare and Medicaid Services ("CMS"), state boards of pharmacy, state health departments, various accrediting bodies, and similar regulatory authorities in other countries, including laws and regulations governing bribery, fraud, kickbacks, and false claims. The costs associated with complying with the various applicable federal, state, local, national, and international laws and regulations could be significant, and the failure to comply with such legal requirements could have an adverse effect on our results of operations and financial condition. The FDA extensively regulates, among other things, the research, development, testing, manufacture, quality control, import, export, safety, effectiveness, labeling, packaging, storage, distribution, record keeping, approval, advertising, promotion, marketing, post-approval monitoring, and post-approval reporting of drug and biologic products under the Federal Food, Drug and Cosmetic Act, its implementing regulations and other laws, including, in the case of biologics, the Public Health Service Act. Our third-party contractors, collaborators, and customers will be required to navigate the various preclinical, clinical and commercial approval requirements of the governing regulatory agencies of the countries in which they wish to conduct studies or seek approval or licensure of their product candidates, which may include regulatory inspections for compliance with current good manufacturing practices ("cGMP"). The process of obtaining regulatory approvals and the subsequent compliance with applicable federal, state, local and foreign statutes and regulations require the expenditure of substantial time and financial resources. This regulatory scrutiny results in our customers imposing rigorous quality and other requirements on us as their supplier through supplier qualification processes and customer contracts and specifications.

The process required by the FDA before a drug or biologic may be marketed in the United States generally involves the following:

- completion of preclinical laboratory tests and animal studies performed in accordance with the FDA's Good Laboratory Practice regulations;
- submission to the FDA of an Investigational New Drug Application ("IND"), which must become effective before clinical trials in the United States may begin;
- performance of adequate and well-controlled human clinical trials to establish the safety and potency of the product candidate for each proposed indication, conducted in accordance with the FDA's good clinical practice ("GCP") regulations;
- preparation and submission to the FDA of a new drug application ("NDA") or biologics license application ("BLA") after completion of all pivotal clinical trials;
- satisfactory completion of an FDA inspection of the manufacturing facility or facilities at which the product is produced to assess compliance with cGMP regulations and to assure that the facilities, methods and controls are adequate to preserve the drug's continued safety, purity and potency, and of selected clinical investigation sites to assess compliance with Good Clinical Practices, or GCPs; and
- FDA review and approval of the NDA or BLA prior to any commercial marketing, sale or distribution of the product.

Environmental, Health and Safety Regulations

We are responsible for ensuring an environmentally responsible, safe, and healthy workplace. We are required to abide by all relevant county, state and federal agency regulations for environmental, health and safety requirements and have the necessary procedure, permits, and licenses in place to operate accordingly. Our contracts with outside suppliers and vendors require compliance with applicable laws and regulations.

HUMAN CAPITAL RESOURCES

As of December 31, 2024, we had 188 full-time employees and part-time employees worldwide. Of these employees, 47 were engaged in research and development, 47 were engaged in operations and quality control and 94 were engaged in selling, general and administrative activities. None of our employees are represented by a labor union or covered by a collective bargaining agreement. Supported by our annual employee survey, we believe our relationship with our employees to be generally good. Our scientists, bioinformatics experts and other professionals work collaboratively as interdisciplinary teams to unlock and advance technological innovation.

Compensation, benefits and development

Our goal is to attract, motivate and retain talent with a focus on encouraging performance, promoting accountability and adhering to our company values. We offer competitive compensation and benefit programs including a company-matched 401(k) Plan, an Employee Stock Purchase Plan ("ESPP"), stock options for eligible employees, health savings and flexible spending accounts, paid time off, education and training programs, and employee assistance programs.

Diversity, equity and inclusion

We are renewing our commitment to increase diversity and foster an inclusive work environment that supports our global workforce and the communities we serve. We recruit the best people for the job regardless of gender, ethnicity or other protected traits and it is our policy to not only comply with all laws applicable to discrimination in the workplace, but to promote a safe and equitable environment for all employees. Our diversity, equity and inclusion principles are also reflected in our employee training and policies. Our diversity, equity and inclusion policies are reviewed regularly and guided by our executive leadership team.

Health and safety

We are committed to maintaining a safe and healthy workplace for our employees. Our policies and practices are intended to protect our employees and the surrounding communities in which we operate.

CORPORATE & AVAILABLE INFORMATION

We were incorporated in Delaware in January 2002 as a wholly-owned subsidiary of Maxygen, Inc. We commenced independent operations in March 2002, after licensing core enabling technology from Maxygen, Inc. Our principal corporate offices are located at 200 Penobscot Drive, Redwood City, California 94063 and our telephone number is (650) 421-8100. Our internet address is www.codexis.com. The information on, or that can be accessed through, our website is not incorporated by reference into this Annual Report on Form 10-K or any other filings we make with the U.S. Securities and Exchange Commission (the "SEC").

We make available on or through our website certain reports and amendments to those reports that we file with, or furnish to, the SEC in accordance with the Exchange Act. These include our Annual Reports on Form 10-K, our Quarterly Reports on Form 10-Q and our Current Reports on Form 8-K, and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Exchange Act. We make this information available on or through our website free of charge as soon as reasonably practicable after we electronically file the information with, or furnish it to, the SEC. Copies of this information may be obtained at the SEC website at www.sec.gov. The contents of these websites are not incorporated into this filing. Further, the references to website URLs are intended to be inactive textual references only.

"Codexis," the Codexis logo, ECO Synthesis, and other trademarks or service marks of Codexis, Inc., appearing in this Annual Report on Form 10-K are the property of Codexis, Inc. This Annual Report on Form 10-K contains additional trade names, trademarks and service marks of others, which are the property of their respective owners. Solely for convenience, trademarks and trade names referred to in this Annual Report on Form 10-K may appear without the ® or ™ symbols.

ITEM 1A. RISK FACTORS

You should carefully consider the risks described below together with the other information set forth in this Annual Report on Form 10-K, which could materially affect our business, financial condition or future results. The risks described below are not the only risks facing our company. Risks and uncertainties not currently known to us or that we currently deem to be immaterial also may materially adversely affect our business, financial condition and/or operating results. Additional discussion of the material risks and uncertainties summarized in this risk factor summary, as well as certain other risks and uncertainties that we face, can be found in this section.

RISK FACTORS SUMMARY

The following is a summary of the principal factors that cause an investment in the Company to be speculative or risky:

- We have a history of net losses and we may not achieve or maintain profitability.
- Therapeutics development prorams are highly regulated and expensive, and our enzyme products are complex and subject to quality control requirements. The ability of our customers, future customers or collaborators, including any company developing RNAi and other RNA-based therapeutics, to advance product candidates utilizing our products to clinical trials and to ultimately receive regulatory approvals is highly uncertain.
- We believe that our products are exempt from Food, Drug, and Cosmetic Act (“FDCA”) requirements, but FDA or other regulators may disagree and find that our products are subject to such requirements.
- We are dependent on a limited number of customers.
- Some of our product supply agreements with customers have finite duration and may not be extended or renewed.
- The demand for our product depends in part on our customers' research and development and the clinical and market success of their products.
- If we are unable to develop and commercialize new products for our target markets, our business and prospects will be harmed.
- A reduction or delay in government funding of research and development for our customers may adversely affect our business.
- With respect to customers purchasing our products for the manufacture of API for which they have exclusivity due to patent protection, the termination or expiration of such patent protection and any resulting generic competition may materially and adversely affect our revenues, financial condition or results of operations.
- The services and offerings we provide are highly complex, and if we encounter problems providing the services or support required, our business could suffer.
- Any productivity issues or higher-than-expected costs at our facilities could result in material and adverse impacts on our financial condition and results of operations.
- We are dependent on a limited number of third-party contract manufacturers for large scale production of substantially all of our enzymes.
- We are dependent on our collaborators, and our failure to successfully manage these relationships could prevent us from developing and commercializing many of our products.
- We have invested significant resources to enable enzymatic nucleic acid synthesis, which is based on novel ideas and technologies that are largely unproven.
- As a result of our strategic shift and our refined focus on the revenue-generating pharma biocatalysis business and the ECO Synthesis platform, we may fail to capitalize on other opportunities that may be more profitable or for which there is a greater likelihood of success.
- Given our change in strategic direction, we may receive limited revenue or no future value from certain of our existing license agreements.

- The timing of customer orders and related product revenue recognition is unpredictable and may cause our operating results to vary significantly from quarter to quarter, which could adversely affect our stock price.
- We use hazardous materials in our business, and we must comply with environmental laws and regulations.
- We may need additional capital in the future in order to expand our business.
- We may not be able to comply with the terms of our five-year term loan and security agreement (our "Loan Agreement") with Innovatus Life Sciences Lending Fund I, LP ("Innovatus"), an affiliate of Innovatus Capital Partners, LLC.
- Even if our customers or collaborators obtain regulatory approval for any products utilizing our enzymes, such products will remain subject to ongoing regulatory requirements, which may result in significant additional expense.
- If we or our customers fail to comply with certain healthcare laws, including fraud and abuse laws, we could face substantial penalties and our business, results of operations, financial condition and prospects could be adversely affected.
- Our efforts to prosecute, maintain, protect and/or defend our intellectual property rights may not be successful.
- Third parties may claim that we are infringing, violating or misappropriating their intellectual property rights, which may subject us to costly and time-consuming litigation and prevent us from developing or commercializing our technology, products or services.
- We may be involved in lawsuits to protect or enforce our intellectual property rights, which could be expensive, time-consuming and unsuccessful.
- If our biocatalysts are stolen, misappropriated or reverse engineered, others could use these biocatalysts to produce competing products.
- We are subject to anti-takeover provisions in our certificate of incorporation and bylaws and under Delaware law that could delay or prevent an acquisition of our company.
- Market and economic conditions may negatively impact our business, financial condition, and share price.
- Business interruptions resulting from political events, disasters or other disturbances could delay us in the process of developing our products and could disrupt our sales.

Risks Related to Our Business and Strategy

We have a history of net losses and we may not achieve or maintain profitability.

We have incurred net losses since our inception, including losses of $65.3 million, $76.2 million, and $33.6 million for the years ended December 31, 2024, 2023, and 2022, respectively. As of December 31, 2024, we had an accumulated deficit of $562.8 million. If we are unable to continue to successfully develop and commercialize products in our pharma biocatalysis business, increase sales of existing products and services, develop and commercialize our ECO Synthesis manufacturing platform, and or develop new products or services, or otherwise expand our business, whether through new or expanded collaborations or other products and services, our net losses may increase and we may never achieve profitability. In addition, some of our agreements, including the agreements with GSK, Merck, Novartis, Nestlé, Aldevron, Roche, Crosswalk and Alphazyme provide for milestone payments, usage payments, and/or future royalty or other payments, which we will only receive if we and/or our collaborators develop and commercialize products or achieve technical milestones. We also intend to continue to fund the development of additional proprietary performance enzyme products and advance new technologies like our ECO Synthesis manufacturing platform. There can be no assurance that any of these products or services will become commercially viable or that we will ever achieve profitability on a quarterly or annual basis. If we fail to achieve profitability, or if the time required to achieve profitability is longer than we anticipate, we may not be able to continue our business. Even if we do achieve profitability, we may not be able to sustain or increase profitability on a quarterly or annual basis.

Therapeutics development programs are highly regulated and expensive, and our enzyme products are complex and subject to quality control requirements. The ability of our customers, future customers or collaborators, including any company developing RNAi and other RNA-based therapeutics, to advance product candidates utilizing our products to clinical trials and to ultimately receive regulatory approvals is highly uncertain.

Although we are no longer developing our own portfolio of biotherapeutics product candidates, we continue to develop enzyme products, including our ECO Synthesis manufacturing platform, that may be used by our customers, future customers or collaborators in connection with their biotherapeutic product candidates. The successful development of biotherapeutic candidates involves many risks and uncertainties, requires long timelines and may lead to uncertain results.

Our customers are subject to extensive regulations by the FDA and similar regulatory authorities in other countries for conducting clinical trials and commercializing products for therapeutic, vaccine or diagnostic use. These regulations result in our customers imposing quality requirements on us for the manufacture of our enzyme products through supplier qualification processes and customer contracts and specifications.

In order to market a biologic or drug product in the United States, our customers, future customers or collaborators must undergo the following process required by the FDA:

- completion of extensive preclinical laboratory tests and preclinical animal studies, all performed in accordance with the FDA's Good Laboratory Practice requirements;
- submission to the FDA of an IND, which must become effective before human clinical studies may begin in the United States;
- approval by an independent institutional review board (“IRB”) representing each clinical site before the clinical study may be initiated at the site;
- performance of adequate and well-controlled human clinical studies in accordance with GCP requirements to establish the safety, purity and potency (or efficacy) of the product candidate for each proposed indication;
- preparation of and submission to the FDA of an NDA or BLA after completion of all clinical studies;
- potential review of the product candidate by an FDA advisory committee;
- satisfactory completion of an FDA pre-approval inspection of the manufacturing facilities where the product candidate is produced to assess compliance with current Good Manufacturing Practice (“cGMP”) requirements;
- FDA review and approval of a BLA or NDA prior to any commercial marketing or sale of the product in the United States; and
- any post-approval requirements, if applicable.

The regulatory approval processes of the FDA and comparable foreign authorities are lengthy, time consuming and the results are inherently unpredictable. If our customers, future customers or collaborators are ultimately unable to obtain regulatory approval for their biotherapeutic product candidates utilizing our enzyme products, our business may be harmed. In addition, if our customers, future customers or collaborators fail to comply with applicable FDA or other regulatory requirements at any time during the drug development process, clinical testing, the approval process or after approval, they may become subject to administrative or judicial penalties, including the FDA’s refusal to approve a pending application, withdrawal of an approval, warning letters, product recalls and additional enforcement actions, any of which may have an adverse effect on our financial condition.

We believe that our products are exempt from FDCA requirements, but FDA or other regulators may disagree and find that our products are subject to such requirements.

We believe our enzyme products are exempt from compliance with the FDCA and the implementing GMP regulations of the FDA, as our products are further processed and incorporated into final drug or biologic products by our customers and we do not make claims related to their safety or effectiveness. Our products are currently manufactured following the voluntary quality standards of ISO 9001:2015, and we anticipate signing and announcing a partnership with a CDMO to provide enzymatically synthesized, GMP-grade siRNA to customers in the near term. Our planned collaboration with a CDMO may not come to fruition and, even if it does, may not scale up as anticipated. Even if the scale up plans succeed, we or the CDMO may incur delays in production or have insufficient product for consumers. And, in the event we, or our suppliers, produce products that fail to comply with voluntary quality standards or GMP standards imposed by customers, we may incur delays in fulfilling orders, write-downs or other losses, damages resulting from product liability claims and harm to our reputation.

In the future, our products could become subject to more onerous regulation, or the FDA could disagree with our assessment that our enzyme products are exempt from current GMP regulations. In addition, the FDA could conclude that the products we provide to our customers are actually subject to the pharmaceutical, drug or biologic quality-related regulations for manufacturing, processing, packing or holding of drugs, biologics, or finished pharmaceuticals, and could take enforcement action against us, including requiring us to stop distribution of our products until we are in compliance with applicable regulations, which would reduce our revenue, increase our costs and adversely affect our business, prospects, results of operations and financial condition.

We are dependent on a limited number of customers.

Although we continue to expand our customer base, our current revenues are derived from a limited number of key customers. For the years ended December 31, 2024 and 2023, customers that each individually contributed 10% or more of our total revenue accounted for 51% and 35% of our total revenues, respectively. We expect a limited number of customers to continue to account for a significant portion of our revenues for the foreseeable future. This customer concentration increases the risk of quarterly fluctuations in our revenues and operating results. The loss or reduction of business from one or a combination of our significant customers could, materially adversely affect our revenues, financial condition and results of operations.

Some of our product supply agreements with customers, if in place, have finite duration, may not be extended or renewed and generally do not require the customer to purchase any particular quantity or quantities of our products.

Our product supply agreements with customers generally have a finite duration, may not be extended or renewed and generally do not require the customer to purchase any particular quantity or quantities of our products. Additionally, some customers order our products on a quote and purchase order basis under standard terms and conditions, with no guarantee of future orders. While our products are not considered commodities and may not be easily substituted for by our customers, particularly when our products are used in the manufacture of active pharmaceutical ingredients, our customers may nevertheless terminate or fail to renew their product supply agreements with us or significantly curtail their purchases thereunder under certain circumstances. We are working to develop new relationships with existing or new customers, but despite these efforts we may not, at the time that any of our existing product supply agreements expire or are terminated, or purchases thereunder curtailed, have other contracts in place generating similar or material revenue. Any such expiration, termination or reduction could materially adversely affect our revenues, financial condition and results of operations. For the year ended December 31, 2024, we derived a majority of our product revenue from these product supply agreements.

The demand for our products depends in part on our customers' research and development and the clinical and market success of their products. Our business, financial condition, and results of operations may be harmed if our customers spend less on, or are less successful in, these activities. In addition, customer spending may be affected by, among other things, general market and economic conditions beyond our control.

Our customers are engaged in research, development, production, and marketing of pharmaceutical products and intermediates. The amount our customers spend on research, development, production, and marketing, as well as the outcomes of such research, development, and marketing activities, have a large impact on our sales and profitability, particularly the amount our customers choose to spend on our offerings. Available resources, the need to develop new products, and consolidation in the industries in which our customers operate may have an impact on such spending. Our customers and potential customers finance their research and development spending from private and public sources. A reduction in available financing for and spending by our customers, for these reasons or because of continued unstable or unpredictable economic and marketplace conditions, could have a material adverse effect on our business, financial condition, and results of operations. If our customers are not successful in attaining or retaining product sales due to market conditions, reimbursement issues, or other factors, our results of operations may be materially adversely affected.

If we are unable to develop and commercialize new products for the pharmaceutical, biotherapeutics, diagnostics and life science tools markets, our business and prospects will be harmed.

We plan to launch new products for the pharmaceutical, biotherapeutics, diagnostics and other life science tools markets such as our ECO Synthesis manufacturing platform. These efforts are subject to numerous risks, including the following:

- customers in these markets may be reluctant to adopt new manufacturing processes that use our enzymes;
- we may be unable to successfully develop the enzymes or manufacturing processes for our products in a timely and cost-effective manner, if at all;
- we may face difficulties in transferring the developed technologies to our customers and the contract manufacturers that we may use for commercial scale production of intermediates and enzymes in these markets;
- the biotherapeutics products that use our tools may not receive regulatory approval or be commercially viable;
- the contract manufacturers that we may use may be unable to scale their manufacturing operations to meet the demand for these products and we may be unable to secure additional manufacturing capacity;
- customers may not be willing to purchase these products for these markets from us on favorable terms, if at all;
- we may face product liability litigation, unexpected safety or efficacy concerns and product recalls or withdrawals;
- our customers' products may experience adverse events or face competition from new products, which would reduce demand for our products;
- we may face pressure from existing or new competitive products; and
- we may face pricing pressures from existing or new competitors, some of which may benefit from government subsidies or other incentives.

A reduction or delay in government funding of research and development for our customers may adversely affect our business.

A portion of our revenue is derived from customers whose funding is partially dependent on both the level and timing of funding from government sources, which funding can be difficult to forecast. Government funding of research and development is subject to the political process, which is inherently fluid and unpredictable. Our revenue may be adversely affected if our customers delay or limit purchases as a result of uncertainties surrounding the approval of government budget proposals, including reduced allocations to government agencies that fund research and development activities. If government proposals to reduce or eliminate budgetary deficits result in reduced allocations to government agencies that fund research and development activities, or results of operations may be materially adversely affected.

With respect to customers purchasing our products for the manufacture of APIs for which they have exclusivity due to patent protection, the termination or expiration of such patent protection and any resulting generic competition may materially and adversely affect our revenues, financial condition or results of operations.

With respect to customers purchasing our products for the manufacture of API, or lead to the manufacture of API, for which exclusivity due to patent protection has or is about to expire, we can expect that the quantity of our products sold to such customers for such products may decline as generic competition for the API increases. While we anticipate that we may, in some cases, also be able to sell products to these generic competitors for the manufacture of these APIs, or lead to the manufacture of these APIs, the overall effect on our revenues, financial condition and results of operations could be materially adverse.

The services and offerings we provide are highly complex, and if we encounter problems providing the services or support required, our business could suffer.

The offerings we provide are highly complex, due in part to strict regulatory requirements and the inherent nature of services we provide, including exacting manufacturing processes. A failure of our quality control systems in our facilities could cause problems in connection with facility operations for a variety of reasons, including equipment malfunction, viral contamination, failure to follow specific manufacturing instructions, protocols and standard operating procedures, problems with raw materials or environmental factors. In addition, any failure to meet required quality standards may result in our failure to timely deliver products to our customers which, in turn, could damage our reputation for quality and service. Any such incident could, among other things, lead to increased costs, lost revenue, reimbursement to customers for lost drug substances, damage to and possibly termination of customer relationships, time and expense spent investigating and remediating the cause and, depending on the cause, similar losses with respect to other manufacturing runs. In addition, such issues could subject us to litigation, the cost of which could be significant. These risks will be intensified in connection with the build-out of our Innovation Lab, through which we expect to continue scaling specific manufacturing processes of our customers' specific therapeutic assets and, eventually, expect to manufacture GLP-grade RNAi therapeutic material in sufficient quantities to support customers' preclinical development.

Any productivity issues or higher-than-expected costs at our facilities could result in material and adverse impacts on our financial condition and results of operations.

As we continue to scale up our manufacturing processes in connection with the completed build-out of our Innovation Lab and our anticipated partnership with a CDMO to provide enzymatically synthesized, GMP-grade siRNA to customers, we may face manufacturing capacity constraints or higher-than-expected costs at our facilities, including our Innovation Lab. There can be no assurance that revenue lost due to productivity issues or capacity constraints will be recovered on expected timeframes or at all. If we are unsuccessful in remedying any productivity issues at our facilities or those of our CDMO, if we are unable to recover revenue from unproduced batches when expected or at all, or if costs at our facilities are higher than expected, we may experience material and adverse impacts on our financial condition and results of operations.

We are dependent on a limited number of third-party contract manufacturers for large scale production of substantially all of our enzymes. We are working to qualify new contract manufacturers to produce certain of our enzymes, however those efforts may not be successful and therefore we may experience limitations on our ability to supply our enzymes to customers.

Manufacturing of our enzymes is conducted primarily in four locations: our in-house facility in Redwood City, California, and at three third-party CMOs: Lactosan in Kapfenberg, Austria, ACSD in Anagni, Italy, and Sekisui in Maidstone, United Kingdom. Generally, we perform smaller scale manufacturing in-house and outsource the larger scale manufacturing to these contract manufacturers. 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 larger scale manufacturing of the enzymes used in our pharmaceutical and life sciences businesses.

Accordingly, we face risks of difficulties with, and interruptions in, performance by third party manufacturers, the occurrence of which could adversely impact the availability, launch and/or sales of our enzymes in the future. Enzyme manufacturing capacity limitations at our third-party manufacturers and manufacturing delays could negatively affect our business, reputation, results of operations and financial condition. The failure of any contract manufacturer to supply us our required volumes of enzyme on a timely basis, or to manufacture our enzymes in compliance with our specifications or applicable quality requirements or in volumes sufficient to meet demand, would adversely affect our ability to sell pharmaceutical and complex chemicals products, could harm our relationships with our customers or collaborators and could negatively affect our revenues and operating results. We may be forced to secure alternative sources of supply, which may be unavailable on commercially acceptable terms, and could cause delays in our ability to deliver products to our customers, increase our costs and decrease our profit margins.

We currently have supply agreements in place with Lactosan, ACSD and Sekisui. In the absence of a supply agreement, a contract manufacturer will be under no obligation to manufacture our enzymes and could elect to discontinue their manufacture at any time. If we require additional manufacturing capacity and are unable to obtain it in sufficient quantity, we may not be able to increase our product sales, or we may be required to make substantial capital investments to build that capacity or to contract with other manufacturers on terms that may be less favorable than the terms we currently have with our suppliers. If we choose to build our own additional manufacturing facility, it could take several years or longer before our facility is able to produce commercial volumes of our enzymes. Any resources we expend on acquiring or building internal manufacturing capabilities could be at the expense of other potentially more profitable opportunities. In addition, if we contract with other manufacturers, we may experience delays of several months in qualifying them, which could harm our relationships with our customers or collaborators and could negatively affect our revenues or operating results.

We are dependent on our collaborators, and our failure to successfully manage these relationships could prevent us from developing and commercializing many of our products and achieving or sustaining profitability.

Our ability to maintain and manage collaborations in our markets is fundamental to the success of our business. We currently have license agreements, research and development agreements, supply agreements and/or distribution agreements with various collaborators. We may have limited or no control over the amount or timing of resources that any collaborator is able or willing to devote to our partnered products or collaborative efforts. Any of our collaborators may fail to perform its obligations. These collaborators may breach or terminate their agreements with us or otherwise fail to conduct their collaborative activities successfully and in a timely manner. Further, our collaborators may not develop products arising out of our collaborative arrangements or devote sufficient resources to the development, manufacture, marketing or sale of these products. If any of these events occur, especially if they occur in our collaborations with GSK, Merck or Novartis, or if we fail to maintain our agreements with our collaborators, we may not be able to commercialize our existing and potential products or grow our business or generate sufficient revenues to support our operations, we may not receive contemplated milestone payments and royalties under the collaboration, and we may be involved in litigation. Our collaboration opportunities could be harmed and our financial condition and results of operations could be negatively affected if:

- we or our collaborators do not achieve our research and development objectives under our collaboration agreements in a timely manner, or at all;
- we develop products and processes or enter into additional collaborations that conflict with the business objectives of our other collaborators;
- our collaborators and/or our contract manufacturers do not receive the required regulatory and other approvals necessary for the commercialization of the applicable product;
- we are unable to manage multiple simultaneous collaborations;
- our collaborators or licensees are unable or unwilling to implement or use the technology or products that we provide or license to them;
- our collaborators become competitors of ours or enter into agreements with our competitors;
- our collaborators become unable or less willing to expend their resources on research and development or commercialization efforts due to general market conditions, their financial condition or other circumstances beyond our control; or
- our collaborators experience business difficulties, which could eliminate or impair their ability to effectively perform under our agreements.

Even after collaboration relationships expire or terminate, some elements of the collaboration may survive. For instance, certain rights, licenses and obligations of each party with respect to intellectual property and program materials may survive the expiration or termination of the collaboration.

Finally, our business could be negatively affected if any of our collaborators or suppliers undergoes a change of control or were to otherwise assign the rights or obligations under any of our agreements.

We have invested significant resources to enable enzymatic nucleic acid synthesis, which is based on novel ideas and technologies that are largely unproven.

Our ECO Synthesis manufacturing platform is designed to enable the commercial-scale manufacture of RNAi and other RNA-based therapeutics through an enzymatic route. While we believe enzymatic nucleic acid synthesis will offer certain improvements over phosphoramidite chemistry, including with respect to required infrastructure investments, batch size limitations and waste disposal challenges, the enzymatic route is novel and has not yet been commercialized. As such, we may be faced with unforeseen results, delays and setbacks, in addition to the other foreseeable risks and uncertainties associated with the ongoing development of the ECO Synthesis manufacturing platform and other products.

Other challenges with a new technology such as our ECO Synthesis manufacturing platform include having an unknown and unproven development and regulatory path, uncertainly around the value that we can realize from the technology, uncertainty around the timeline for adoption of the technology by customers, and uncertainly around our ability to secure supply of necessary materials or to manufacture at GMP at scale and partner with customers on manufacturing and utilizing the technology. We may also be unable to achieve the expected benefits of the ECO Synthesis manufacturing platform in a timely manner, or at all.

There can be no assurance that these events we may experience in the future related to enzymatic synthesis will not cause significant delays or unanticipated costs, or that such development problems can be solved. Any delay or difficulties in developing and commercializing our ECO Synthesis manufacturing platform or any of our other current or future products could adversely affect our business and operations.

Competitors and potential competitors who have greater resources and experience than we do may develop products and technologies that make ours obsolete or may use their greater resources to gain market share at our expense.

The biocatalysis and performance enzyme industries and each of our target markets are characterized by rapid technological change. Our future success will depend on our ability to maintain a competitive position with respect to technological advances. In addition, as we enter new markets, we will face new competition and will need to adapt to competitive factors that may be different from those we face today.

We are aware that other companies, including Ginkgo Bioworks, BRAIN, and Enzymicals AG, have alternative methods for obtaining and generating genetic diversity or use mutagenesis techniques to produce genetic diversity. Some companies, including Biomatter Designs, Arzeda, and Enzymaster, leverage predictive computational algorithms to guide enzyme engineering efforts. In addition, academic institutions such as the California Institute of Technology, University of Washington, University of Manchester, and the Austrian Centre of Industrial Biotechnology are also working in this field. Technological development by others may result in our technology, products and services, as well as products developed by our customers using our biocatalysts, becoming obsolete.

Our primary competitors in the performance enzymes for the pharmaceutical products markets include (i) companies marketing either conventional, non-enzymatic processes or biocatalytic enzymes; (ii) manufacturers of pharmaceutical intermediates and APIs; and (iii) existing in-house technologies (both biocatalysts and conventional catalysts) within our client and potential client companies. The principal methods of competition and competitive differentiation in this market are price, product quality and performance, including manufacturing yield, safety and environmental benefits, and speed of delivery of product. Pharmaceutical manufacturers that use biocatalytic processes can face increased competition from manufacturers that use more conventional processes and/or manufacturers that are based in regions (such as India and China) with lower regulatory, safety and environmental costs.

The market for the manufacture and supply of APIs and intermediates is large with many established companies. These companies include many of our large innovator and generic pharmaceutical customers, such as Merck, GSK, Novartis, Pfizer, Bristol-Myers, Kyorin, Urovant, and Teva which have significant internal research and development efforts directed at developing processes to manufacture APIs and intermediates. The processes used by these companies include classical conventional organic chemistry reactions, chemo catalytic reactions, biocatalytic reactions or combinations thereof. Our biocatalytic based manufacturing processes must compete with these internally developed routes. Additionally, we also face competition from companies developing and marketing conventional catalysts such as Solvias Inc., BASF and Takasago International Corporation.

The market for supplying enzymes for use in pharma biocatalysis is fragmented. There is competition from large industrial enzyme companies, such as Novozymes and DuPont, as well as subsidiaries of larger contract research/contract manufacturing organizations, such as DSM, Cambrex Corporation, Lonza, WuXi STA and Almac Group Ltd. Some fermentation pathway design companies, like Ginkgo Bioworks (who recently acquired Zymergen), whose traditional focus has been to design microorganisms that express small molecule chemicals, could extend into designing organisms that express enzymes. There is also competition in the enzyme customization and optimization area from several smaller companies, such as BRAIN AG, Arzeda Corp., c-LEcta GmbH and Evocatal GmbH.

We face competitive challenges related to our ECO Synthesis manufacturing platform. The current industry standard for manufacturing RNAi therapeutics is a well-established, chemical-based method, SPOS, utilizing phosphoramidite chemistry. Primary competitors in this space include CDMOs, such as Agilent Technologies, which has made significant capital investment to expand their RNA manufacturing capabilities using phosphoramidite chemistry. In addition, CDMOs and large pharmaceutical companies are seeking to make incremental improvements to phosphoramidite chemistry, including the development of ligation-based approaches, liquid-phase synthesis, and solvent recycling. There are also multiple early-stage competitors who are pursuing fully enzymatic approaches to the manufacture of RNA, including EnPlusOne Biosciences, a private startup company, and a UK-based consortium led by CPI and consisting of multiple academic and research organizations, including The University of Manchester and large pharmaceutical companies, including AstraZeneca plc and Novartis.

Our ability to compete successfully in any of these markets will depend on our ability to develop proprietary products that reach the market in a timely manner and are technologically superior to and/or are less expensive than other products on the market. Many of our competitors have substantially greater production, financial, research and development, personnel and marketing resources than we do. They also started developing products earlier than we did, which may allow them to establish blocking intellectual property positions or bring products to market before we can. In addition, certain of our competitors may also benefit from local government subsidies and other incentives that are not available to us. As a result, our competitors may be able to develop competing and/or superior technologies and processes and compete more aggressively and sustain that competition over a longer period of time than we could. Our technologies and products may be rendered obsolete or uneconomical by technological advances or entirely different approaches developed by one or more of our competitors. We cannot be certain that any products we develop in the future will compare favorably to products offered by our competitors or that our existing or future products will compare favorably to any new products that are developed by our competitors. As more companies develop new intellectual property in our markets, the possibility of a competitor acquiring patent or other rights that may limit our products or potential products increases, and could additionally lead to litigation.

Our limited resources relative to many of our competitors may cause us to fail to anticipate or respond adequately to new developments and other competitive pressures. This failure could reduce our competitiveness and market share, adversely affect our results of operations and financial position, and prevent us from obtaining or maintaining profitability.

We have investments in non-marketable securities, which may subject us to significant impairment charges.

We have investments in illiquid or non-marketable equity securities acquired in private transactions. As of December 31, 2024, 1.9% of our consolidated assets consisted of investment securities, which are illiquid investments. Investments in non-marketable, securities are inherently risky and difficult to value. We account for our non-marketable equity securities under the measurement alternative. Under the measurement alternative, the carrying value of our non-marketable equity investments is adjusted to fair value for observable transactions for identical or similar investments of the same issuer or impairment. We evaluate our investment in non-marketable securities when circumstances indicate that we may not be able to recover the carrying value. We may impair these securities and establish an allowance for a credit loss when we determine that there has been an “other-than-temporary” decline in estimated fair value of the equity security compared to its carrying value. The impairment analysis requires significant judgment to identify events or circumstances that would likely have a material adverse effect on the fair value of the investment. Future impairment charges from the write down in value of these securities could have a material adverse effect on our financial condition or results of operations.

Ethical, legal and social concerns about genetically engineered products and processes could limit or prevent the use of our technology, products and processes and limit our revenues.

Some of our technology, products and services, such as our ECO Synthesis manufacturing platform, are genetically engineered or involve the use of genetically engineered products or genetic engineering technologies. If we and/or our collaborators are not able to overcome the ethical, legal, and social concerns relating to genetic engineering, our technology, products and services may not be accepted. Any of the risks discussed below could result in increased expenses, delays, or other impediments to our programs or the public acceptance and commercialization of products and processes dependent on our technologies or inventions. Our ability to develop and commercialize one or more of our technologies, products, or processes could be limited by the following factors:

- public attitudes about the safety and environmental hazards of, and ethical concerns over, genetic research and genetically engineered products and processes, which could influence public acceptance of our technologies, products and processes;
- public attitudes regarding, and potential changes to laws governing ownership of, genetic material, which could harm our intellectual property rights with respect to our genetic material and/or discourage collaborators from supporting, developing, or commercializing our technology, products and services; and
- governmental reaction to negative publicity concerning genetically modified organisms, which could result in greater government regulation of genetic research and derivative products.

The subject of genetically modified organisms has received negative publicity, which has aroused public debate. This adverse publicity could lead to greater regulation and trade restrictions on imports of genetically altered products. The biocatalysts that we develop have significantly enhanced characteristics compared to those found in naturally occurring enzymes or microbes. While we produce our biocatalysts only for use in a controlled industrial environment, the release of such biocatalysts into uncontrolled environments could have unintended consequences. Any adverse effect resulting from such a release could have a material adverse effect on our business and financial condition, damage our reputation, and/or expose us to liability for any resulting harm.

As a result of our strategic shift and our refined focus on certain programs and business lines, we may fail to capitalize on other opportunities that may be more profitable or for which there is a greater likelihood of success.

Because we have limited financial and managerial resources, we have recently focused our efforts on developing certain programs and business lines. As a result, we may forego or delay pursuit of business opportunities that later prove to have greater commercial potential. Further our resource allocation decisions may cause us to fail to capitalize on viable commercial products or profitable market opportunities. In addition, our spending on current and future research and development programs, such as ECO Synthesis manufacturing platform that is in development, may not yield any commercially viable products. If we do not accurately evaluate the commercial potential or target market for a particular program or business line, our business and results of operations could be harmed.

Given our change in strategic direction, we may receive limited revenue or no future value from certain of our existing license agreements.

While we have historically invested significant time and financial resources in the development of biotherapeutics assets, we have terminated investment in our biotherapeutics business and in other programs. As a result, we are renegotiating some of these, along with other license agreements for product candidates in our biotherapeutics, food and feed, and non-core life science assets. For example, we entered into the Acquisition Agreement with Nestlé under which they acquired rights to our co-developed lipase enzyme CDX-7108 and we received an upfront payment and the right to downstream milestones and royalties, terminating our prior SCA and development agreement with Nestlé. While we are working to amend or terminate some of our agreements and enter into new agreements in such a way that we may be able to receive future revenue or other benefits, we may be unsuccessful in doing so. As a result, it remains uncertain as to whether we will receive any value or benefit from these license agreements going forward. Further, renegotiating these agreements may be costly and could divert management attention, which could have an adverse impact on our business and results of operations.

The timing of our customer orders and related product revenue recognition is unpredictable and may cause our operating results to vary significantly from quarter to quarter, which could adversely affect our stock price.

A majority of our product revenue is derived from purchase orders or supply agreements and is recognized either at a point in time when the control of the product has been transferred to the customer or over time as the product is manufactured. The occurrence and timing of any transfer of control of product sold to our customers can be difficult to predict, and the recognition of revenue can vary widely depending on timing of product deliveries and satisfaction of other obligations. Product orders during any given period may be concentrated in relatively few contracts, intensifying the amplitude and irregularity of our revenue streams from quarter to quarter. In addition, the timing of contract or order commencements and completions may exacerbate the uneven pattern. Moreover, our revenue or operating expenses in one period may be disproportionately higher or lower relative to the others due to, among other factors, revenue fluctuations or increases in expenses as we invest in key technology development projects and improvements, develop and commercialize new and existing products and expand our business development and collaboration with new customers. If such fluctuations occur or if our operating results deviate from our expectations or the expectations of investors or securities analysts, our stock price could be adversely affected.

We use hazardous materials in our business and we must comply with environmental laws and regulations. Any claims relating to improper handling, storage or disposal of these materials or noncompliance of applicable laws and regulations could be time consuming and costly and could adversely affect our business and results of operations.

Our research and development, manufacturing, and commercial processes involve the use of hazardous materials, including chemical, radioactive and biological materials, such as acetonitrile, which is used in some of our purification processes. Our operations also produce hazardous waste. We cannot eliminate entirely the risk of accidental contamination or discharge and any resultant injury from these materials. Federal, state, local and foreign laws and regulations govern the use, manufacture, storage, handling and disposal of, and human exposure to, these materials. We may face liability for any injury or contamination that results from our use or the use by third parties of these materials, and our liability may exceed our total assets. Although we believe that our activities comply in all material respects with environmental laws, there can be no assurance that violations of environmental, health and safety laws will not occur in the future as a result of human error, accident, equipment failure or other causes. Compliance with applicable environmental laws and regulations may be expensive, and the failure to comply with past, present or future laws could result in the imposition of fines, third party property damage, product liability and personal injury claims, investigation and remediation costs, the suspension of production or a cessation of operations, and our liability may exceed our total assets. Liability under environmental laws can be joint and several and without regard to comparative fault. Environmental laws could become more stringent over time imposing greater compliance costs and increasing risks and penalties associated with violations, which could impair our research, development or production efforts and harm our business. In addition, we may be required to indemnify some of our customers or suppliers for losses related to our failure to comply with environmental laws, which could expose us to significant liabilities.

Our ability to use our net operating loss carryforwards to offset future taxable income may be subject to certain limitations.

In general, under Section 382 of the Internal Revenue Code of 1986, as amended (the "Code"), a corporation that undergoes an "ownership change" is subject to limitations on its ability to utilize its pre-change net operating loss carryforwards ("NOLs"), to offset future taxable income. If the Internal Revenue Service challenges our analysis that our existing NOLs are not subject to limitations arising from previous ownership changes, our ability to utilize NOLs could be limited by Section 382 of the Code. Future changes in our stock ownership, some of which are outside of our control, could result in an ownership change under Section 382 of the Code. Furthermore, our ability to utilize NOLs of companies that we may acquire in the future may be subject to limitations. For these reasons, we may not be able to utilize a material portion of the NOLs reflected in our financial statements, even if we attain profitability.

As a public reporting company, we are subject to rules and regulations established from time to time by the SEC and Nasdaq regarding our internal controls over financial reporting. We may not complete needed improvements to our internal controls over financial reporting in a timely manner, or these internal controls may not be determined to be effective, which may adversely affect investor confidence in our company and, as a result, the value of our common stock and your investment.

We are subject to the rules and regulations established from time to time by the SEC and Nasdaq. These rules and regulations require, among other things, that we establish and periodically evaluate procedures with respect to our internal controls over financial reporting. As part of these evaluations, material weaknesses in our internal controls over financial reporting may be identified. A material weakness is a deficiency, or a combination of deficiencies, in internal controls over financial reporting such that there is a reasonable possibility that a material misstatement of a company's annual or interim consolidated financial statements will not be prevented or detected on a timely basis. While we were able to remediate previously identified material weaknesses in our internal controls over financial reporting, there can be no guarantee we will not identify similar or other material weaknesses in the future and if such material weaknesses are identified, there can be no guarantee we would be able to remediate such material weaknesses. Any material weaknesses in our internal controls may adversely affect our ability to record, process, summarize and accurately report timely financial information and, as a result, our consolidated financial statements may contain material misstatements or omissions.

Reporting obligations as a public company place a considerable strain on our financial and management systems, processes and controls, as well as on our personnel. In addition, as a public company we are required to document and test our internal controls over financial reporting pursuant to Section 404 of the Sarbanes-Oxley Act so that our management can certify as to the effectiveness of our internal controls over financial reporting. Likewise, while we currently qualify as a "smaller reporting company" under the SEC rules, for any fiscal years in which we are not considered a smaller reporting company, our independent registered public accounting firm is required to provide an attestation report on the effectiveness of our internal controls over financial reporting in our Annual Reports on Form 10-K. If our management is unable to certify the effectiveness of our internal controls or if our independent registered public accounting firm cannot deliver a report attesting to the effectiveness of our internal controls over financial reporting, or if we identify or fail to remediate material weaknesses in our internal controls, we could be subject to regulatory scrutiny and a loss of public confidence, which could seriously harm our reputation and the market price of our common stock. In addition, if we do not maintain adequate financial and management personnel, processes and controls, we may not be able to manage our business effectively or accurately report our financial performance on a timely basis, which could cause a decline in our common stock price and may seriously harm our business.

We may need additional capital in the future in order to expand our business.

Our future capital requirements may be substantial, particularly as we continue to develop our business. Although we believe that, based on our current level of operations, our existing cash, cash equivalents and equity securities will provide adequate funds for ongoing operations, planned capital expenditures and working capital requirements for at least the next 12 months, we may need additional capital if our current plans and assumptions change. Our need for additional capital will depend on many factors, including the financial success of our performance enzyme business, our spending to develop and commercialize new and existing enzyme products and the amount of collaboration funding we may receive to help cover the cost of such expenditures, 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, including the ongoing commercialization of our ECO Synthesis manufacturing platform, scaling the ECO Synthesis manufacturing platform to GMP capability, and the filing, prosecution, enforcement and defense of patent claims. 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 enzyme 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.

In addition, we may choose to raise additional capital due to market conditions or strategic considerations, such as funding the ongoing commercialization of our ECO Synthesis manufacturing platform and a GMP manufacturing facility, even if we believe we have sufficient funds for our current or future operating plans. We may seek to obtain such additional capital through equity offerings, including pursuant to our Controlled Equity Offering℠ Sales Agreement (the "Cantor Sales Agreement") with Cantor Fitzgerald & Co., as sales agent ("Cantor"), debt financings, credit facilities and/or strategic collaborations. If future financings involve the issuance of equity securities, our existing stockholders would suffer dilution. In addition, under our Loan Agreement with Innovatus, we are subject to restrictive covenants that limit our ability to conduct our business and could be subject to additional covenants to the extent we seek other debt financing in the future. Strategic collaborations may also place restrictions on 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.

Covenants and other provisions in our Loan Agreement with Innovatus restrict our business and operations in many ways, and if we do not effectively manage our covenants, our financial conditions and results of operations could be adversely affected. In addition, our operations may not provide sufficient cash to meet the repayment obligations of our debt incurred under the Loan Agreement.

Pursuant to the Loan Agreement, Innovatus has been granted a security interest in substantially all of our assets. If an event of default occurs under the Loan Agreement, Innovatus may foreclose on its security interest and liquidate some or all of these assets, which would harm our business, financial condition and results of operations.

In the event of a default in connection with our bankruptcy, insolvency, liquidation, or reorganization, Innovatus would have a prior right to substantially all of our assets to the exclusion of our general unsecured creditors. Only after satisfying the claims of Innovatus and any unsecured creditors would any amount be available for our equity holders.

The pledge of these assets and other restrictions imposed in the Loan Agreement may limit our flexibility in raising capital for other purposes. Because substantially all of our assets are pledged to secure the Loan Agreement obligations, our ability to incur additional indebtedness or to sell or dispose of assets to raise capital may be impaired, which could have an adverse effect on our financial flexibility.

In addition, if we are unable to comply with certain financial and operating restrictions in the Loan Agreement, we may be limited in our business activities and access to credit or may default under the Loan Agreement. Provisions in the Loan Agreement impose restrictions or require prior approval on our ability, and the ability of certain of our subsidiaries to, among other things:

- sell, lease or transfer certain parts of our business or property, including equity interests of our subsidiaries;
- engage in new lines of business;
- acquire new companies and merge or consolidate;
- incur additional debt or guarantee the indebtedness of others or our subsidiaries;
- create liens or encumbrances;
- pay cash dividends and make distributions or redeem or repurchase our capital stock;
- make certain investments;
- enter into transactions with affiliates; and
- terminate or, in certain cases, amend our material agreements.

The Loan Agreement also contains other customary covenants. We may not be able to comply with these covenants in the future. Our failure to comply with these covenants may result in the declaration of an event of default, which, if not cured or waived, may result in the acceleration of the maturity of indebtedness outstanding under the Loan Agreement and would require us to pay all amounts outstanding. If the maturity of our indebtedness is accelerated, we may not have sufficient funds then available for repayment or we may not have the ability to borrow or obtain sufficient funds to replace the accelerated indebtedness on terms acceptable to us or at all. Our failure to repay our obligations under the Loan Agreement could result in Innovatus foreclosing on all or a portion of our assets, which could force us to curtail or cease our operations.

If we engage in any acquisitions, we will incur a variety of costs and may potentially face numerous risks that could adversely affect our business and operations.

We have made acquisitions in the past, and if appropriate opportunities become available, we expect to acquire additional businesses, assets, technologies, or products to enhance our business in the future. For example, in October 2010, we acquired substantially all of the patents and other intellectual property rights associated with Maxygen's directed evolution technology.

In connection with any future acquisitions, we could:

- issue additional equity securities, which would dilute our current stockholders;
- incur substantial debt to fund the acquisitions;
- use our cash to fund the acquisitions; or
- assume significant liabilities including litigation risk.

Acquisitions involve numerous risks, including problems integrating the purchased operations, technologies or products, unanticipated costs and other liabilities, diversion of management's attention from our core businesses, adverse effects on existing business relationships with current and/or prospective collaborators, customers and/or suppliers, risks associated with entering markets in which we have no or limited prior experience and potential loss of key employees. We do not have extensive experience in managing the integration process and we may not be able to successfully integrate any businesses, assets, products, technologies or personnel that we might acquire in the future without a significant expenditure of operating, financial and management resources, if at all. The integration process could divert management's time from focusing on operating our business, result in a decline in employee morale and cause retention issues to arise from changes in compensation, reporting relationships, future prospects or the direction of the business. Acquisitions may also require us to record goodwill and non-amortizable intangible assets that will be subject to impairment testing on a regular basis and potential periodic impairment charges, incur amortization expenses related to certain intangible assets, and incur large and immediate write offs and restructuring and other related expenses, all of which could harm our operating results and financial condition. In addition, we may acquire companies that have insufficient internal financial controls, which could impair our ability to integrate the acquired company and adversely impact our financial reporting. If we fail in our integration efforts with respect to any of our acquisitions and are unable to efficiently operate as a combined organization, our business and financial condition may be adversely affected.

Risks Related to Government Regulation

Even if our customers, future customers or collaborators obtain regulatory approval for any products utilizing our enzymes, such products will remain subject to ongoing regulatory requirements, which may result in significant additional expense.

Any products that receives FDA approval will remain subject to ongoing regulatory requirements for manufacturing, labeling, packaging, distribution, storage, advertising, promotion, sampling, record-keeping and submission of safety and other post-market information, among other things. Any regulatory approvals received for such products may also be subject to limitations on the approved indicated uses for which they may be marketed or to the conditions of approval, or contain requirements for potentially costly post-marketing testing and surveillance studies. For example, the holder of an approved NDA or BLA in the United States is obligated to monitor and report adverse events and any failure of a product to meet the specifications in the NDA or BLA. In the United States, the holder of an approved NDA or BLA must also submit new or supplemental applications and obtain FDA approval for certain changes to the approved product, product labeling or manufacturing process. Similar provisions apply in the European Union (the "EU"). Advertising and promotional materials must comply with FDA rules and are subject to FDA review, in addition to other potentially applicable federal and state laws. Similarly, in the EU any promotion of medicinal products is highly regulated and, depending on the specific jurisdiction involved, may require prior vetting by the competent national regulatory authority. In addition, product manufacturers and their facilities are subject to payment of user fees and continual review and periodic inspections by the FDA and other regulatory authorities for compliance with cGMP requirements and adherence to commitments made in the NDA, BLA or foreign marketing application.

If our customers, future customers or our collaborators or a regulatory agency discovers previously unknown problems with a product such as adverse events of unanticipated severity or frequency or problems with the facility where the product is manufactured or disagrees with the promotion, marketing or labeling of that product, a regulatory agency may impose restrictions relative to that product, the manufacturing facility or our customers or collaborators, including requiring recall or withdrawal of the product from the market or suspension of manufacturing.

In addition, if our customers or collaborators fail to comply with applicable regulatory requirements, the FDA and other regulatory authorities may:

- issue an untitled letter or a warning letter asserting a violation of the law;
- seek an injunction, impose civil or criminal penalties, and impose monetary fines, restitution or disgorgement of profits or revenues;
- suspend or withdraw regulatory approval;
- issue safety alerts, Dear Healthcare Provider letters, press releases or other communications containing warnings or other safety information about the product;
- mandate modification of promotional materials and labeling and issuance of corrective information;
- issue consent decrees or corporate integrity agreements, or debar or exclude from federal healthcare programs;
- suspend or terminate any ongoing clinical trials or implement requirements to conduct post-marketing studies or clinical trials;
- refuse to approve a pending NDA, BLA or comparable foreign marketing application (or any supplements thereto);
- restrict the labeling, marketing, distribution, use or manufacturing of products;
- seize or detain products or otherwise require the withdrawal or recall of products from the market;
- refuse to approve pending applications or supplements to approved applications;
- refuse to permit the import or export of products; or
- refuse government contracts.

Any government investigation of alleged violations of law could require us to expend significant time and resources in response and could generate negative publicity. The occurrence of any event or penalty described above may also inhibit our customers or collaborators' ability to commercialize products and our ability to generate revenues.

In addition, the FDA's policies, and policies of foreign regulatory agencies, may change, including due to judicial challenges, and additional regulations may be enacted that could prevent, limit or delay regulatory approval of product candidates. We cannot predict the likelihood, nature or extent of government regulation that may arise from future legislation or administrative or executive action, either in the United States or abroad. If we are slow or unable to adapt to changes in existing requirements or the adoption of new requirements or policies, or if we are not able to maintain regulatory compliance, we may be subject to enforcement action and we may not achieve or sustain profitability.

If we or our customers fail to comply with certain healthcare laws, including fraud and abuse laws, we could face substantial penalties and our business, results of operations, financial condition and prospects could be adversely affected.

The healthcare industry is highly regulated. We, and our customers, are subject to various local, state, federal, national, and international laws and regulations, which include laws and regulations promulgated by the FDA, HHS, state boards of pharmacy, state health departments, and similar regulatory bodies in other countries. Additionally, our business operations and future arrangements with investigators, healthcare professionals, and consultants, among others, may expose us and our customers to broadly applicable fraud and abuse and other healthcare laws and regulations, including, without limitation, the federal Anti-Kickback Statute, the federal civil False Claims Act, the federal Civil Monetary Penalties Law, and analogous state laws. These laws may constrain the business or financial arrangements and relationships through which we will conduct our operations. Because of the breadth of these laws and narrowness of available statutory and regulatory exceptions, it is possible that some of our business activities could be regulated by or subject to challenge under one or more of such laws. We cannot ensure that our compliance controls, policies, and procedures will in every instance protect us from acts of our employees, agents, contractors, or collaborators that turn out to violate any of the laws described above. If we or our operations are found to be in violation of any of the laws described above or any other governmental regulations that apply to us, we may be subject to penalties, including civil and criminal penalties, damages, fines, imprisonment and the curtailment or restructuring of our operations, any of which could materially adversely affect our ability to operate our business and our financial results.

Ongoing healthcare legislative and regulatory reform measures may have a material adverse effect on our business and results of operations.

In the United States, there have been, and we expect there will continue to be, a number of legislative, regulatory, and administrative initiatives to contain healthcare costs. Some of these initiatives, such as ongoing healthcare reform, including with respect to reforming drug pricing, adverse changes in governmental or private funding of healthcare products and services, legislation or regulations governing patient access to care, and the delivery, coverage, pricing, and reimbursement of pharmaceuticals and healthcare services may cause our customers to change the amount of our offerings that they purchase from us or the price they are willing to pay us for these offerings. The timing of legislative, regulatory or executive action related to future healthcare reforms, if any, remains uncertain, results of the 2024 U.S. Presidential and Congressional elections, and potential subsequent developments, increase the uncertainty related to healthcare regulatory environment. If cost-containment efforts or other healthcare reform measures limit our customers' profitability, they may decrease research and development spending, which could decrease the demand for our products and services and materially adversely affect our growth prospects. Any of these factors could harm our customers' businesses, which, in turn, could materially adversely affect our business, financial condition, results of operations, cash flows, and prospects.

We cannot predict the likelihood, nature, or extent of other health reform initiatives that may arise from future legislative, administrative, or other action. Any substantial revision of applicable healthcare legislation or regulation could have a material adverse effect on the demand for our customers' products, which in turn could have a negative impact on our results of operations, financial condition, or business. Changes in the healthcare industry's pricing, selling, inventory, distribution, or supply policies or practices, or in public or government sentiment for the industry as a whole, could also significantly reduce our revenue and results of operations.

Compliance with European Union chemical regulations could be costly and adversely affect our business and results of operations.

Some of our products are subject to the EU regulatory regime known as The Registration, Evaluation and Authorization of Chemicals ("REACH"). REACH mandates that certain chemicals manufactured in, or imported into, the EU be registered and evaluated for their potential effects on human health and the environment. Under REACH, we and our contract manufacturers located in the EU are required to register certain of our products based on the quantity of such product imported into or manufactured in the EU and on the product's intended end-use. The registration, evaluation and authorization process under REACH can be costly and time consuming. Problems or delays in the registration, evaluation or authorization process under REACH could delay or prevent the manufacture of some of our products in, or the importation of some of our products into, the EU, which could adversely affect our business and results of operations. In addition, if we or our contract manufacturers fail to comply with REACH, we may be subject to penalties or other enforcement actions, which could have a material adverse effect on our business and results of operations.

The biopharmaceutical industry is subject to extensive regulatory obligations and policies that may be subject to significant and abrupt change, including due to judicial challenges, election cycles, and resulting regulatory updates and changes in policy priorities.

In June 2024, the U.S. Supreme Court issued an opinion holding that courts reviewing agency action pursuant to the Administrative Procedure Act "must exercise their independent judgment" and "may not defer to an agency interpretation of the law simply because a statute is ambiguous." The decision will have a significant impact on how lower courts evaluate challenges to agency interpretations of law, including those by HHS, the FDA, CMS and other agencies with significant oversight of the biopharmaceutical industry. The new framework is likely to increase both the frequency of such challenges and their odds of success by eliminating one way in which the government previously prevailed in such cases. As a result, significant regulatory policies will be subject to increased litigation and judicial scrutiny.

In addition, federal agency priorities, leadership, policies, rulemaking, communications, spending and staffing may be significantly impacted by election cycles. For example, the current U.S. presidential administration has committed to significantly reduce government spending through cuts to federal healthcare programs and reductions in the workforces of key government agencies, such as HHS, the FDA and CMS. Efforts by the current administration to limit federal agency budgets or personnel may result in reductions to agency budgets, employees and operations, which may lead to slower response times and longer review periods, potentially affecting the ability of our customers, future customers or collaborators to obtain regulatory approval for their product candidates utilizing our enzyme products. Any resulting changes in regulation may result in unexpected delays, increased costs, or other negative impacts on our business that are difficult to predict.

Risks Related to Intellectual Property

Our efforts to prosecute, maintain, protect and/or defend our intellectual property rights may not be successful.

We will continue to file and prosecute patent applications and maintain trade secrets in an ongoing effort to protect our intellectual property rights. It is possible that our current patents, or patents which we may later acquire, may be successfully challenged or invalidated, in whole or in part. It is also possible that we may not obtain issued patents from our pending patent applications. We sometimes permit certain patents or patent applications to lapse or go abandoned under appropriate circumstances. Due to uncertainties inherent in prosecuting patent applications, sometimes patent applications are rejected, and we subsequently abandon them. It is also possible that we may develop proprietary technology, products or services in the future that are not patentable or that the patents of others will limit or altogether preclude our ability to conduct business. In addition, any patent issued to us or to our licensor may provide us with little or no competitive advantage, in which case we may abandon such patent, license it to another entity or terminate the license agreement.

Our means of protecting our proprietary rights may not be adequate and our competitors may independently develop technologies, products or services that are identical or similar to ours or that compete with ours. Patent, trademark, copyright and trade secret laws afford only limited protection for our technology, products and services. The laws of many countries do not protect our proprietary rights to as great of an extent as do the laws of the United States. Despite our efforts to protect our proprietary rights, unauthorized parties have in the past attempted, and may in the future attempt, to operate under the aspects of our intellectual property rights, or proprietary technology, products or services or products, or to obtain and use information that we regard as proprietary. Third parties may also design around our proprietary rights, which may render our protected technology, services and products less valuable, if the design around is favorably received in the marketplace. In addition, if any of our technology, products and services are covered by third-party patents or other intellectual property rights, we could be subject to various legal actions. For example, we are aware of certain third-party intellectual property that does or may overlap with aspects of the Company's technology. We cannot assure that our technology products and/or services do not infringe, violate or misappropriate any patents or other intellectual property rights owned or controlled by others or that they will not in the future.

Litigation may be necessary to enforce our intellectual property rights, to protect our trade secrets, to determine the validity and scope of the proprietary rights of others, or to defend against claims of infringement, invalidity, misappropriation, or other claims.

Any such litigation could result in substantial costs and diversion of our resources. Moreover, any settlement of or adverse judgment resulting from litigation relating to intellectual property rights could require us to obtain a license to continue to make, use, import, sell or offer for sale the technology, products or services that is the subject of the claim, or otherwise restrict or prohibit our use of the technology, products or services.

Our ability to compete may decline if we do not adequately prosecute, maintain, protect and/or defend our proprietary technology, products or services or our intellectual property rights.

Our success depends in part on our ability to obtain patents and maintain adequate protection of our intellectual property rights directed to our technology, products and services in the United States and other countries. We have adopted a strategy of seeking patent protection in the United States and in foreign countries with respect to certain of the technology used in or relating to our products, services, and processes. As such, as of December 31, 2024, we owned or controlled approximately 1,760 active issued patents and pending patent applications in the United States and in various foreign jurisdictions. As of December 31, 2024, our patents and patent applications, if issued, have terms that expire between 2024 and approximately 2045. We also have license rights to a number of issued patents and pending patent applications in the United States and in various foreign jurisdictions. Our owned and licensed patents and patent applications include those directed to our enabling technology and to the methods and products that support our business in the pharmaceutical manufacturing, life sciences, oligonucleotide synthesis, and other markets. We intend to continue to apply for patents relating to our technology, methods, services and products as we deem appropriate.

Issuance of claims in patent applications and enforceability of such claims once issued involve complex legal and factual questions and, therefore, we cannot predict with any certainty whether any of our issued patents will survive invalidity claims asserted by third parties. Issued patents and patents issuing from pending applications may be challenged, invalidated, circumvented, rendered unenforceable or substantially narrowed in scope. In addition, the inventorship and ownership of the patents and patent applications may be challenged by others. Moreover, the United States Leahy-Smith America Invents Act ("AIA"), enacted in September 2011, brought significant changes to the United States patent system, which include a change to a "first to file" system from a "first to invent" system and changes to the procedures for challenging issued patents and disputing patent applications during the examination process, among other things. While interference proceedings are possible for patent claims filed prior to March 16, 2013, many of our filings will be subject to the post- and pre-grant proceedings set forth in the AIA, including citation of prior art and written statements by third parties, third party pre-issuance submissions, ex parte reexamination, inter partes review, post-grant review, and derivation proceedings. We may need to utilize the processes provided by the AIA for supplemental examination or patent reissuance. These proceedings could result in substantial cost to us even if the outcome is favorable. Even if successful, any proceeding may result in loss of certain claims. Any litigation or proceedings could divert our management's time and efforts. Even unsuccessful claims brought by third parties could result in significant legal fees and other expenses, diversion of management time, and disruption in our business. Uncertainties resulting from initiation and continuation of any patent or related litigation could harm our ability to compete.

Additional uncertainty may result from legal precedent handed down by the United States Federal Circuit Court and Supreme Court as they determine legal issues concerning the scope and construction of patent claims and inconsistent interpretation of patent laws by the lower courts. Accordingly, we cannot ensure that any of our pending patent applications will result in issued patents, or even if issued, predict the breadth of the claims upheld in our, our licensors', and other companies' patents. Given that the degree of future protection for our proprietary rights is uncertain, we cannot ensure that: (i) we or our licensors were the first to invent the inventions covered by each of our pending applications, (ii) we or our licensors were the first to file patent applications for these inventions, or (iii) the proprietary technology, products or services we develop will be patentable. In addition, unauthorized parties may attempt to copy or otherwise obtain and use our technology, products and services. Monitoring unauthorized use of our intellectual property rights is difficult, and we cannot be certain that the steps we have taken will prevent unauthorized use of our technology, products or services, particularly in certain foreign countries where the local laws may not protect our proprietary rights as fully as in the United States. Moreover, third parties could practice our inventions in territories where we do not have patent protection. Such third parties may then try to import products made using our inventions into the United States or other countries. If competitors are able to use our proprietary technology, products or services, our ability to compete effectively could be harmed. In addition, others may independently develop and obtain patents for technologies, products or services that are similar to or superior to our technologies, products or services. If that happens, we may need to license these technologies, products or services, and we may not be able to obtain licenses on reasonable terms, if at all, which could cause harm to our business.

Similarly, foreign courts have made, and will likely continue to make, changes in how the patent laws in their respective jurisdictions are interpreted. Changes in patent laws and regulations in other countries or jurisdictions, changes in the governmental bodies that enforce them, or changes in how the relevant governmental authority enforces patent laws or regulations may weaken our ability to obtain new patents or to enforce patents that we own or may obtain in the future. For example, in some cases, we have filed for unitary patent protection under the rules implemented on June 1, 2023, in the European Patent Office. We will continue to assess this route of protection on a case-by-case basis, as applications are filed and patents are granted through the European Patent Office. This may alter our ability to protect our patents in some European countries. Further, the laws of some foreign countries do not protect proprietary rights to the same extent or in the same manner as the laws of the United States. For example, in some foreign jurisdictions, governments have the right to compel patent owners to grant others licenses to their intellectual property under certain circumstances. In addition, any protection afforded by foreign patents may be more limited than that provided under U.S. patent and intellectual property laws. We may encounter significant problems in enforcing and defending our intellectual property both in the United States and abroad. For example, if the issuance in a given country of a patent covering an invention is not followed by the issuance in other countries of patents covering the same invention, or if any judicial interpretation of the validity, enforceability or scope of the claims or the written description or enablement in a patent issued in one country is not similar to the interpretation given to the corresponding patent issued in other countries, our ability to protect our intellectual property rights in those countries may be limited. Changes in either patent laws or in interpretations of patent laws in the United States and other countries may materially diminish the value of our intellectual property rights or narrow the scope of our patent protection. We cannot predict future changes in the interpretation of patent laws or changes to patent laws that might be enacted into law by U.S. and foreign legislative bodies. Those changes may materially affect our patents or patent applications and our ability to obtain additional patent protection in the future. Any of the foregoing could have a material adverse effect on our competitive position, business, financial condition, results of operations and prospects.

Third parties may claim that we are infringing, violating or misappropriating their intellectual property rights, which may subject us to costly and time-consuming litigation and prevent us from developing or commercializing our technology, products or services.

Our commercial success also depends in part on our ability to operate without infringing, violating or misappropriating patents and other intellectual property rights of third parties, and without breaching any licenses or other agreements that we have entered into with regard to our technologies, products or services. We cannot ensure that patents have not been issued, or will not be issued, to third parties that could block our ability to obtain patents or to operate as we would like. There may be patents in some countries that, if valid, may block our ability to make, use, sell, or offer for sale our technology, products or services in those countries, or import our products into those countries, if we are unsuccessful in circumventing or acquiring rights to these patents. There also may be claims in patent applications filed in some countries that, if granted and valid, may also block our ability to commercialize technology, products, services or processes in these countries if we are unable to circumvent or obtain rights to them.

The industries in which we operate and the biotechnology industry, in particular, are characterized by frequent and extensive litigation regarding patents and other intellectual property rights. Many biotechnology companies have employed intellectual property litigation as a way to gain a competitive advantage. We are aware of some patents and patent applications relating to aspects of our technologies, products or services filed by, and issued to, third parties. We cannot assure that if such third-party patents rights are asserted against us that we would ultimately prevail. Any involvement in litigation or other intellectual property proceedings inside and/or outside of the United States to defend against claims that we infringe, misappropriate or violate the intellectual property rights of others may divert our management's time from focusing on business operations and could cause us to spend significant amounts of money. Any potential intellectual property litigation also could force us to do one or more of the following:

- stop making, using, selling, offering for sale or importing our technologies, products and services that use the subject intellectual property;
- pay monetary damages to the third party asserting claims against us;
- grant or transfer rights to third parties relating to our patents or other intellectual property rights;
- obtain from the third party asserting its intellectual property rights a license to make, sell, offer for sale, import or use the relevant technology, product or service, which license may not be available on reasonable terms, or at all; or
- redesign those technologies, products, services or processes that use any allegedly infringing, misappropriated or violated intellectual property rights, or relocate the operations relating to the allegedly infringing, misappropriated or violated intellectual property rights to another jurisdiction, which may result in significant cost or delay to us, could be technically infeasible or could prevent us from making, selling, offering for sale, using or importing some of our technologies, products or services in the United States or other jurisdictions.

We may be involved in lawsuits to protect or enforce our intellectual property rights, which could be expensive, time-consuming and unsuccessful.

Competitors may infringe, violate or misappropriate our intellectual property rights or those of our licensors. To prevent infringement, violation, misappropriation or other unauthorized use, we have in the past filed, and may in the future be required to file, enforcement claims, which can be expensive and time-consuming. In addition, in an enforcement proceeding, a court may decide that the intellectual property right that we own or control is not valid, is unenforceable and/or is not infringed, violated or misappropriated. In addition, in legal proceedings against a third party to enforce a patent directed at one of our technologies, products or services, the defendant could counterclaim that our patent is invalid and/or unenforceable in whole or in part. In patent enforcement litigation in the United States, defendant counterclaims alleging invalidity and/or unenforceability are commonplace. Grounds for a patent validity challenge include an alleged failure to meet any of several statutory requirements, including lack of novelty, obviousness or non-enablement. Grounds for an unenforceability assertion could include an allegation that someone connected with prosecution of the patent withheld relevant information from the United States Patent and Trademark Office ("USPTO") or made a misleading statement during prosecution. Third parties may also raise similar claims before the USPTO, even outside the context of enforcement litigation. The outcome following legal assertions of invalidity and unenforceability is unpredictable, and prior art could render our patents or those of our licensors invalid. If a defendant were to prevail on a legal assertion of invalidity and/or unenforceability, we would lose at least part, and perhaps all, of the patent protection on the respective technology, products or services. Such a loss of patent protection could have a material adverse impact on our business.

Even if resolved in our favor, litigation or other legal proceedings relating to our intellectual property rights may cause us to incur significant expenses and could distract our technical and management personnel from their normal responsibilities. In addition, there could be public announcements of the results of hearings, motions or other interim proceedings or developments and if securities analysts or investors perceive these results to be negative, it could have a substantial adverse effect on the price of our common stock. Such litigation or proceedings could substantially increase our expenses and reduce the resources available for operations and research and development activities. We may not have sufficient financial or other resources to conduct such litigation or proceedings adequately. Some of our competitors may be able to sustain the costs of such litigation or proceedings more effectively than we can because of their greater financial resources. Uncertainties resulting from the initiation and continuation of patent litigation or other proceedings could compromise our ability to compete in the marketplace. Furthermore, because of the substantial amount of discovery required in connection with U.S. intellectual property litigation, there is a risk that some of our confidential information could be compromised by disclosure during this type of litigation.

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

The laws of some foreign countries where we do business do not protect intellectual property rights to the same extent as the laws of the United States. Many companies have encountered significant problems in protecting and enforcing intellectual property rights in certain foreign jurisdictions. The legal systems of certain countries, particularly certain developing countries, do not favor the enforcement of patents and other intellectual property rights, particularly those relating to biotechnology technologies. Accordingly, our efforts to protect and enforce our intellectual property rights in such countries may be inadequate. This could make it difficult for us to stop the infringement, violation or misappropriation of our patents or other intellectual property rights. Additionally, proceedings to enforce our patent rights in foreign jurisdictions could result in substantial costs and divert our efforts and attention from other aspects of our business.

If our biocatalysts, or the genes that code for our biocatalysts, are stolen, misappropriated or reverse engineered, others could use these biocatalysts or genes to produce competing products.

Third parties, including our contract manufacturers, customers and those involved in shipping our biocatalysts, often have custody or control of our biocatalysts. If our biocatalysts, or the genes that code for our biocatalysts, were stolen, misappropriated or reverse engineered, they could be used by other parties who may be able to reproduce these biocatalysts for their own commercial gain. If this were to occur, it may be difficult for us to challenge this type of use, especially in countries with limited intellectual property rights protection or in countries in which we do not have patents covering the misappropriated biocatalysts.

Confidentiality and non-use agreements with employees, consultants, advisors and other third parties may not adequately prevent disclosures and non-use of trade secrets and other proprietary information.

In addition to patent protection, we also rely on other intellectual property rights, including protection of copyright, trade secrets, know-how and/or other proprietary information that is not patentable or that we elect not to patent. However, trade secrets can be difficult to protect, and some courts are less willing or unwilling to protect trade secrets. To maintain the confidentiality of our trade secrets and proprietary information, we rely in part on trade secret law and contractual agreements to protect our confidential and proprietary information and processes. We generally enter into confidentiality and invention assignment agreements with our employees, consultants and third parties working on our behalf upon their commencement of a relationship with us. However, trade secrets and confidential information are difficult to protect and we cannot guarantee that we have entered into such agreements with each party that may have or have had access to our trade secrets or proprietary technology and processes and we may not enter into such agreements with all employees, consultants and third parties who have been involved in the development of our intellectual property rights. Nevertheless, without our permission or awareness, our confidential and proprietary information may be disclosed to third parties, used by the respective individuals for purposes other than for the Company's business, or obtained through illegal means, such that third parties could reverse engineer our biocatalysts, enzyme products and processes, to attempt to develop the same technology or develop substantially equivalent technology.

Costly and time-consuming litigation could be necessary to enforce and determine the scope of our confidential and proprietary rights, and failure to protect our trade secrets could adversely affect our competitive business position. If any of our trade secrets were lawfully obtained, we may be unable to prevent them, or those to whom they communicate it, from using that technology or information to compete with us or disclosing it publicly. Therefore, these events could have a material adverse effect on our business, financial condition and results of operations. In particular, a failure to protect our proprietary rights may allow competitors to copy our technology, which could adversely affect our pricing and market share.

In addition to contractual measures, we try to protect the confidential nature of our proprietary information by maintaining physical security of our premises and electronic security of our information technology systems. Such security measures may not, for example, in the case of misappropriation of a trade secret by an employee, consultant or other third party with authorized access or with unauthorized access but an intent to steal, provide adequate protection for our proprietary information. Our security measures may not prevent such employee, consultant or other third party from misappropriating our trade secrets and using them or providing them to a competitor, and recourse we take against such misconduct may not provide an adequate remedy to protect our interests fully. While we use commonly accepted security measures, trade secret violations are often a matter of state law in the United States, and the criteria for protection of trade secrets can vary among different jurisdictions. If the steps we have taken to maintain our trade secrets are deemed inadequate, we may have insufficient recourse against third parties for misappropriating the trade secret.

Risks Related to Owning our Common Stock

We are subject to anti-takeover provisions in our certificate of incorporation and bylaws and under Delaware law that could delay or prevent an acquisition of our company, even if the acquisition would be beneficial to our stockholders.

Provisions in our amended and restated certificate of incorporation and our bylaws may delay or prevent an acquisition of the Company. Among other things, our amended and restated certificate of incorporation and bylaws provide for a board of directors which is divided into three classes, with staggered three-year terms and provide that all stockholder action must be effected at a duly called meeting of the stockholders and not by a consent in writing, and further provide that only our Board of Directors (our "Board"), the chairman of our Board, our chief executive officer or president may call a special meeting of the stockholders. In addition, our amended and restated certificate of incorporation allows our Board, without further action by our stockholders, to issue up to 5,000,000 shares of preferred stock in one or more series and to fix the rights, preferences, privileges and restrictions thereof. These provisions may also frustrate or prevent any attempts by our stockholders to replace or remove our current management by making it more difficult for stockholders to replace members of our Board, who are responsible for appointing the members of our management team. Furthermore, because we are incorporated in Delaware, we are governed by the provisions of Section 203 of the Delaware General Corporation Law ("DGCL") which prohibits, with some exceptions, stockholders owning in excess of 15% of our outstanding voting stock from merging or combining with us. Finally, our charter documents establish advanced notice requirements for nominations for election to our Board and for proposing matters that can be acted upon at stockholder meetings. Although we believe these provisions together provide for an opportunity to receive higher bids by requiring potential acquirers to negotiate with our Board, they would apply even if an offer to acquire our company may be considered beneficial by some stockholders.

Our bylaws designate a state or federal court located within the State of Delaware as the sole and exclusive forum for substantially all disputes between us and our stockholders, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us our current or former directors, officers, stockholders, or other employees.

Our bylaws provide that, unless we consent in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware shall be the sole and exclusive forum for (i) any derivative action or proceeding brought on behalf of us under Delaware law, (ii) any action asserting a claim of breach of a fiduciary duty owed by any current or former director, officer, or other employee of the Company to us or our stockholders, (iii) any action asserting a claim against us or any of our directors, officers, or other employees arising pursuant to any provision of the DGCL or our certificate of incorporation or bylaws (as either may be amended from time to time), (iv) any action asserting a claim against us governed by the internal affairs doctrine, or (v) any other action asserting an "internal corporate claim," as defined under Section 115 of the DGCL. The forgoing provisions do not apply to any claims arising under the Securities Act and, unless we consent in writing to the selection of an alternative forum, the federal district courts of the United States will be the sole and exclusive forum for resolving any action asserting a claim arising under the Securities Act.

These choice of forum provisions may limit a stockholder's ability to bring a claim in a judicial forum that it finds favorable for disputes with us or any of our current or former directors, officers, or other employees, which may discourage lawsuits with respect to such claims. There is uncertainty as to whether a court would enforce such provisions, and the enforceability of similar choice of forum provisions in other companies' charter documents has been challenged in legal proceedings. It is possible that a court could find these types of provisions to be inapplicable or unenforceable, and if a court were to find the choice of forum provision to be inapplicable or unenforceable in an action, we may incur additional costs associated with resolving such action in other jurisdictions, which could harm our business, results of operations or financial condition.

Our quarterly or annual operating results may fluctuate in the future. As a result, we may fail to meet or exceed the expectations of research analysts or investors, which could cause our stock price to decline.

Our financial condition and operating results have varied significantly in the past and may continue to fluctuate from quarter to quarter and year to year in the future due to a variety of factors, many of which are beyond our control. Factors relating to our business that may contribute to these fluctuations include the following factors, as well as other factors described elsewhere in this report:

- our ability to achieve or maintain profitability;
- our dependence on a limited number of customers;

- some of our product supply agreements with customers have finite duration, may not be extended or renewed and generally do not require the customer to purchase any particular quantity or quantities of our products;
- the timing of customer orders and our related revenue recognition may vary significantly from quarter to quarter;
- with respect to customers purchasing our products for the manufacture of active pharmaceutical ingredients for which they have exclusivity due to patent protection, the termination or expiration of such patent protection and any resulting generic competition may materially and adversely affect our revenues, financial condition or results of operations;
- our dependence on a limited number of products in our performance enzymes business;
- our reliance on a limited number of contract manufacturers for large scale production of substantially all of our enzyme products;
- our relationships with, and dependence on, collaborators in our principal markets;
- our ability to successfully and timely develop and commercialize new products, including our ECO Synthesis manufacturing platform, for the markets we serve;
- the potential of GSK, Merck, Novartis or any other performance enzyme customer terminating their agreements with us;
- the success of our customers' products in the market and the ability of such customers to obtain regulatory approvals for products and processes;
- our ability to deploy our technology platform in life science tools markets;
- our dependence on our collaborators or customers' product candidates which could unexpectedly fail at any stage of preclinical or clinical development;
- our dependence on our collaborators or customers' product candidates which may lack the ability to work as intended or cause undesirable side effects;
- our ability to successfully prosecute and protect our intellectual property;
- our ability to compete if we do not adequately protect our proprietary technologies or if we lose some of our intellectual property rights;
- our ability to avoid infringing the intellectual property rights of third parties;
- our involvement in lawsuits to protect or enforce our patents or other intellectual property rights;
- our ability to enforce our intellectual property rights throughout the world;
- our dependence on, and the need to attract and retain, key management and other personnel;
- our ability to prevent the theft or misappropriation of our biocatalysts, the genes that code for our biocatalysts, know-how or technologies;
- our ability to protect our trade secrets and other proprietary information from disclosure by employees and others;
- our ability to obtain substantial additional capital that may be necessary to expand our business;
- our ability to comply with the terms of our Loan Agreement;
- our ability to timely pay debt service obligations;
- our customers' ability to pay amounts owed to us in a timely manner;
- our ability to avoid charges to earnings as a result of any impairment of goodwill, intangible assets or other long-lived assets;
- changes in financial accounting standards or practices may cause adverse, unexpected financial reporting fluctuations and affect our reported results of operations;

- our ability to maintain effective internal control over financial reporting;
- our dependency on information technology systems, infrastructure and data;
- our ability to control and to improve product gross margins;
- our ability to protect against risks associated with the international aspects of our business;
- the cost of compliance with EU chemical regulations;
- potential advantages that our competitors and potential competitors may have in securing funding or developing products;
- our ability to accurately report our financial results in a timely manner;
- results of regulatory tax examinations;
- market and economic conditions may negatively impact our business, financial condition, and share price;
- business interruptions due to natural disasters, disease outbreaks or other events beyond our control;
- public concerns about the ethical, legal and social ramifications of genetically engineered products and processes;
- our ability to integrate our current business with any businesses that we may acquire in the future;
- our ability to properly handle and dispose of hazardous materials in our business;
- potential product liability claims;
- changes to tax law and related regulations could materially affect our tax obligations and effective tax rate; and
- our ability to use our NOLs to offset future taxable income.

Due to the various factors mentioned above, and others, the results of any prior quarterly or annual periods should not be relied upon as indications of our future operating performance.

We do not intend to pay cash dividends for the foreseeable future.

We currently intend to retain our future earnings, if any, to finance the further development and expansion of our business and do not intend to pay cash dividends in the foreseeable future. Any future determination to pay dividends will be at the discretion of our Board and will depend on our financial condition, results of operations, capital requirements, restrictions contained in future agreements and financing instruments, business prospects and such other factors as our Board deems relevant.

General Risk Factors

If securities or industry analysts do not publish research or reports about our business, or publish negative reports about our business, our stock price and trading volume could decline.

The trading market for our common stock will be influenced by the research and reports that securities or industry analysts publish about us or our business. We do not have any control over these analysts. If one or more of the analysts who cover us downgrade our stock or change their opinion of our stock in a negative manner, our stock price would likely decline. If one or more of these analysts cease coverage of our company or fail to regularly publish reports on us, we could lose visibility in the financial markets, which could cause our stock price or trading volume to decline.

We face risks associated with our international business.

While we have a limited number of employees located outside of the United States, we are and will continue to be dependent upon contract manufacturers located outside of the United States. In addition, we have customers and partners located outside of the United States. Conducting business internationally exposes us to a variety of risks, including:

- changes in or interpretations of U.S. or foreign laws or regulations that may adversely affect our ability to sell our products, repatriate profits to the United States or operate our foreign-located facilities;

- the imposition or increase of tariffs and other trade barriers, including as a result of the recent U.S. presidential election;
- the imposition of limitations on, or increase of, withholding and other taxes on remittances and other payments by foreign subsidiaries or joint ventures;
- the imposition of limitations on genetically-engineered or other products or processes and the production or sale of those products or processes in foreign countries;
- currency exchange rate fluctuations;
- uncertainties relating to foreign laws, regulations and legal proceedings including pharmaceutical, tax, import/export, anti-corruption and exchange control laws;
- the availability of government subsidies or other incentives that benefit competitors in their local markets that are not available to us;
- increased demands on our limited resources created by our operations may constrain the capabilities of our administrative and operational resources and restrict our ability to attract, train, manage and retain qualified management, technicians, scientists and other personnel;
- economic or political instability in foreign countries;
- difficulties associated with staffing and managing foreign operations; and
- the need to comply with a variety of United States and foreign laws applicable to the conduct of international business, including import and export control laws and anti-corruption laws.

Market and economic conditions may negatively impact our business, financial condition, and share price.

Concerns about inflation, energy costs, geopolitical issues, the United States mortgage market and a declining real estate market, unstable global credit markets and financial conditions, and volatile oil prices have led to periods of significant economic instability, diminished liquidity and credit availability, declines in consumer confidence and discretionary spending, diminished expectations for the global economy and expectations of slower global economic growth going forward, increased unemployment rates, and increased credit defaults in recent years. Our general business strategy may be adversely affected by any such economic downturns, volatile business environments and continued unstable or unpredictable economic and market conditions.

During 2023, the closures of Silicon Valley Bank ("SVB") and Signature Bank ("Signature") and their placement into receivership with the Federal Deposit Insurance Corporation, and the government-brokered sale of the deposits and majority of assets of First Republic Bank to JPMorgan Chase, created bank-specific and broader financial institution liquidity risk and concerns. Although government intervention ensured that depositors at these banks have access to their funds, future adverse developments with respect to specific financial institutions or the broader financial services industry may lead to market-wide liquidity shortages, impair the ability of companies to access near-term working capital needs, and create additional market and economic uncertainty. There can be no assurance that future credit and financial market instability and a deterioration in confidence in economic conditions will not occur, and we cannot predict the impact or follow-on effects of these insolvencies more broadly or on our business in particular. Further, we cannot guarantee that the government will intervene to provide depositors with access to funds if similar events occur in the future. If other banks and financial institutions enter receivership or become insolvent in the future, our ability to access our existing cash, cash equivalents, and investments may be threatened, which could have a material adverse effect on our business and financial condition.

In addition, if the market and economic conditions described above continue to deteriorate or do not improve, it may make any necessary debt or equity financing more difficult to complete, more costly, and more dilutive. Failure to secure any necessary financing in a timely manner and on favorable terms could have a material adverse effect on our growth strategy, financial performance, and stock price. Additionally, rising rates of inflation have increased the costs associated with conducting our business, including by causing substantial increases in the costs of materials, including raw materials and consumables, equipment, services, and labor. Moreover, given the unpredictable nature of the current economic climate, including future changes in rates of inflation and the potential for high tariffs or other trade barriers, it may be increasingly difficult for us to predict and control our future expenses, which may harm our ability to conduct our business.

Business interruptions resulting from disasters or other disturbances could delay us in the process of developing our products and could disrupt our sales. Our business continuity and disaster recovery plans may not adequately protect us from a serious disaster or other disturbance.

Our headquarters and other facilities are located in the San Francisco Bay Area, which in the past has experienced both severe earthquakes and wildfires. Earthquakes, wildfires or other natural disasters could severely disrupt our operations, and have a material adverse effect on our business, results of operations, financial condition and prospects. We are also vulnerable to other types of disasters and other events that could disrupt our operations, such as riot, civil disturbances, war, terrorist acts, public health emergencies, domestic or foreign conflicts, infections in our laboratory or production facilities or those of our customers or contract manufacturers and other events beyond our control. If a natural disaster or other event occurred that prevented us from using all or a significant portion of our headquarters, that damaged critical infrastructure, such as our enterprise financial systems or manufacturing resource planning and enterprise quality systems, or that otherwise disrupted operations, including due to impacts on our collaborators, suppliers or other third parties on which we rely, it may be difficult or, in certain cases, impossible, for us to continue our business for a substantial period of time. The disaster recovery and business continuity plans we have in place currently are limited and are unlikely to prove adequate in the event of a serious disaster or similar event, and we may incur substantial expenses as a result of the limited nature of such plans. We do not carry insurance for earthquakes and we may not carry sufficient business interruption insurance to compensate us for losses that may occur. Any losses or damages we incur could have a material adverse effect on our cash flows and success as an overall business.

We are dependent on information technology systems, infrastructure and data, and any failure of these systems could harm our business. Security breaches, loss of data and other disruptions, whether related to artificial intelligence or other means, could compromise sensitive information related to our business or individuals, or prevent us from accessing critical information and expose us to liability, which could adversely affect our business, results of operations and financial condition.

Information technology helps us operate efficiently, interface with customers, maintain financial accuracy and efficiency and accurately produce our financial statements. If we do not allocate and effectively manage the resources necessary to build and sustain the proper technology infrastructure, we could be subject to transaction errors, processing inefficiencies, the loss of customers, business disruptions or the loss of or damage to intellectual property or data through security breach. If our information technology systems do not effectively collect, store, process and report relevant data for the operation of our business, whether due to equipment malfunction or constraints, software deficiencies, or human error, our ability to effectively plan, forecast and execute our business plan and comply with applicable laws and regulations will be impaired, perhaps materially. Our information technology systems and those of our external vendors, strategic partners and other contractors or consultants are vulnerable to attack and damage or interruption from computer viruses and malware (e.g. ransomware), malicious code, natural disasters, terrorism, war, telecommunication and electrical failures, hacking, cyberattacks, phishing attacks and other social engineering schemes, employee theft or misuse, human error, fraud, denial or degradation of service attacks, sophisticated nation-state and nation-state-supported actors or unauthorized access or use by persons inside our organization, or persons with access to systems inside our organization. The prevalence of artificial intelligences ("AI") tools in the global marketplace and rapid changes thereto raise the risk to our systems by making more sophisticated tools available to bad actors, and by making our data more vulnerable to inadvertent leaks or corruption by employees and others. Any such issues could materially and adversely affect our financial condition, results of operations, cash flows and the timeliness with which we report our internal and external operating results. The accessibility of AI intensifies these risks.

Our business may require us to use and store personal information of our customers, employees, and business partners. This may include names, addresses, phone numbers, email addresses, contact preferences, tax identification numbers and payment account information. We require usernames and passwords in order to access our information technology systems. We also use encryption and authentication technologies to secure the transmission and storage of data. However, these security measures may be compromised as a result of security breaches by unauthorized persons, employee error, malfeasance, faulty password management or other irregularity, and result in persons obtaining unauthorized access to our data or accounts. Third parties may attempt to fraudulently induce employees or customers into disclosing usernames, passwords or other sensitive information, which may in turn be used to access our information technology systems. For example, our employees have received "phishing" emails and phone calls attempting to induce them to divulge passwords and other sensitive information. The accessibility of AI intensifies these risks.

In addition, unauthorized persons may attempt to hack into our products or systems to obtain personal data relating to employees and other individuals, our confidential or proprietary information or confidential information we hold on behalf of third parties. We also rely on external vendors to supply and/or support certain aspects of our information technology systems. The systems of these external vendors may contain defects in design or manufacture or other problems that could unexpectedly compromise information security of our own systems, and we are dependent on these third parties to deploy appropriate security programs to protect their systems. If we or our third-party vendors were to experience a significant cybersecurity breach of our or their information systems or data, the costs associated with the investigation, remediation and potential notification of the breach to counterparties and data subjects could be material. Our remediation efforts may not be successful. Further, if such an event were to occur and cause interruptions in our operations, it could result in a material disruption of our development programs and our business operations, whether due to a loss, corruption or unauthorized disclosure of our trade secrets, personal information or other proprietary or sensitive information or other similar disruptions. Attacks upon information technology systems are also increasing in their frequency, levels of persistence, sophistication and intensity, and are being conducted by sophisticated and organized groups and individuals with a wide range of motives and expertise. As a result of the remote work policies we initiated in response to the COVID-19 pandemic, and our continued hybrid working environment, we may also face increased cybersecurity risks due to our reliance on internet technology and the number of our employees who are working remotely, which may create additional opportunities for cybercriminals to exploit vulnerabilities. The accessibility of AI intensifies these risks. We have programs in place to detect, contain and respond to data security incidents, and we make ongoing improvements to our information-sharing products in order to minimize vulnerabilities, in accordance with industry and regulatory standards. However, because the techniques used to obtain unauthorized access to or sabotage systems change frequently and may be difficult to detect, we may not be able to anticipate and prevent these intrusions or mitigate them when and if they occur. Even if identified, we may be unable to adequately and timely investigate or remediate incidents or breaches due to attackers increasingly using tools and techniques that are designed to circumvent controls, to avoid detection and to remove or obfuscate forensic evidence.

We and certain of our external vendors are from time to time subject to cyberattacks and security incidents. While we do not believe that we have experienced any significant system failure, accident, or security breach to date, if such an event were to occur, it could result in the unauthorized access to or unauthorized use, disclosure, release or other processing of personal information, it may be necessary to notify individuals, governmental authorities, supervisory bodies, the media and other parties pursuant to privacy and security laws. Any security compromise affecting us, our service providers, vendors, strategic partners, other contractors, consultants or our industry, whether real or perceived, could harm our reputation, erode confidence in the effectiveness of our security measures and lead to regulatory scrutiny. To the extent that any disruption or security breach were to result in a loss of, or damage to, our data or systems, or inappropriate disclosure of confidential or proprietary or personal information, we could incur liability, including litigation exposure, penalties and fines, which may not be covered by insurance or may be in excess of our insurance coverage. Additionally, we could become the subject of regulatory action or investigation, litigation, including class actions, or other claims and our competitive position could be harmed and the further development of our products could be delayed. If such an event were to occur and cause interruptions in our operations, it could result in a material disruption of our business and could materially and adversely affect our business, results of operations and financial condition.

Actual or perceived failures to comply with applicable data protection, privacy and security laws, regulations, standards and other requirements could adversely affect our business, results of operations and financial condition.

The global data protection landscape is rapidly evolving, and we are or may become subject to state, federal and foreign laws, regulations, decisions and directives governing the privacy, security, collection, storage, transmission, use, processing, retention and disclosure of personal information. Any failure or perceived failure by us to comply with applicable laws or regulations, our internal policies and procedures or our contracts governing our processing of personal information could result in negative publicity, government investigations and enforcement actions, claims by third parties and damage to our reputation, any of which could have a material adverse effect on our operations, financial performance and business.

In the United States, Health Insurance Portability and Accountability Act ("HIPAA") imposes, among other things, certain standards relating to the privacy, security, transmission and breach reporting of certain individually identifiable health information. Certain states have also adopted and continue to adopt new privacy and security laws and regulations, which govern the privacy, processing and protection of health-related and other personal information. Such laws and regulations will be subject to interpretation by various courts and other governmental authorities, thus creating potentially complex compliance issues for us and our future customers and strategic partners. For example, the California Consumer Privacy Act ("CCPA") went into effect on January 1, 2020. The CCPA creates individual privacy rights for California consumers and increases the privacy and security obligations of entities handling certain personal information. The CCPA also provides for civil penalties for violations, as well as a private right of action for data breaches (which has increased the likelihood of, and risks associated with, data breach litigation). Further, the California Privacy Rights Act ("CPRA") significantly amended the CCPA, which went into effect in January 2023. It imposes additional data privacy obligations on covered businesses, including additional consumer rights processes, limitations on data uses, new audit requirements for higher risk data and opt outs for certain uses of sensitive data. It also created a new California privacy protection agency authorized to issue substantive regulations and could result in increased privacy and information security enforcement. Additional compliance investment and potential business process changes may also be required as these laws continue to evolve. Similar laws regulating personal information generally or health information in particular have passed in more than a dozen states and have been proposed in other states and at the federal level, reflecting a trend toward more stringent privacy legislation in the United States. The same is true for emerging laws and regulations related to AI. These developments increase our compliance burden and our risk, including risks of regulatory fines, litigation and associated reputational harm. Any liability from failure to comply with the requirements of these laws could adversely affect our financial condition.

Furthermore, the Federal Trade Commission ("FTC") and many state Attorneys General continue to enforce federal and state consumer protection laws against companies for the collection, use, sharing and security of personal information that appear to be unfair or deceptive. For example, according to the FTC, failing to take appropriate steps to keep consumers' personal information secure can constitute unfair acts or practices in or affecting commerce in violation of Section 5(a) of the Federal Trade Commission Act. The FTC expects a company's data security measures to be reasonable and appropriate in light of the sensitivity and volume of consumer information it holds, the size and complexity of its business, and the cost of available tools to improve security and reduce vulnerabilities.

In the European Union ("EU"), the EU General Data Protection Regulation ("EU GDPR") governs the processing of personal data. The United Kingdom ("UK") has implemented the EU GDPR as the UK GDPR which sits alongside the UK Data Protection Act 2018 (the "UK GDPR", and together with the EU GDPR, the "GDPR"). The GDPR imposes requirements for controllers, including (among others) specific requirements for obtaining valid consent where consent is the legal basis for processing, requirements around accountability and transparency, the obligation to consider data protection when any new products or services are developed, the obligation to comply with individuals' data protection rights, and the obligation to notify relevant data supervisory authorities of notifiable personal data breaches without undue delay (and no later than 72 hours) after becoming aware of the personal data breach (and affected data subjects where the personal data breach is likely to result in a high risk to their rights and freedoms). The EU GDPR provides that EU member states may enact their own additional national laws and regulations regarding the processing of genetic, biometric or health data, which could affect our ability to use and share personal data or could cause our costs to increase and potentially harm our business and financial condition. Failure to comply with the requirements of the GDPR can result in (among other things) fines of up to the greater of €20 million (under the EU GDPR) or £17.5 million (under the UK GDPR) or 4% of an organization's total worldwide annual turnover of the preceding financial year and other administrative penalties. To the extent that we are subject to the GDPR, compliance with the GDPR may require substantial amendments to our procedures and policies and these changes could adversely impact our business by increasing operational and compliance costs or impact business practices. Further, there is a risk that the amended policies and procedures will not be implemented correctly or that individuals within the business will not be fully compliant with the new procedures. There is a risk that we could be impacted by a cybersecurity incident that results in loss or unauthorized disclosure of personal data, potentially resulting in us facing harms similar to those described above.

Among other requirements, the EU GDPR prohibits the international transfer of personal data subject to the EU GDPR from the European Economic Area ("EEA") to third countries that the European Commission does not recognize as having an 'adequate' level of data protection, unless a data transfer mechanism (such as, EU Standard Contractual Clauses or "EU SCCs") has been put in place or a derogation under the EU GDPR can be relied on. In certain cases, companies must also carry out a transfer privacy impact assessment ("TIA") which, among other things, assesses laws governing access to personal data in the recipient country and considers whether supplementary measures that provide privacy protections additional to those provided under the EU SCCs will need to be implemented to ensure an 'essentially equivalent' level of data protection to that afforded in the EEA. In July 2023, the European Commission adopted its Final Implementing Decision granting the United States adequacy ("Adequacy Decision") for EU-U.S. transfers of personal data for entities self-certified to the Atlantic Data Privacy Framework ("DPF"). Entities relying on EU SCCs for transfers to the United States are also able to rely on the analysis in the Adequacy Decisions as support for their TIA regarding the equivalence of U.S. national security safeguards and redress.

The UK GDPR also imposes similar restrictions on transfers of personal data from the UK to jurisdictions that the UK Government does not consider adequate, including the United States. The UK Government has published its own form of the EU SCCs, known as the International Data Transfer Agreement and an International Data Transfer Addendum to the EU SCCs. The UK Information Commissioner's Office has also published its own version of the TIA, although entities may choose to adopt either the EU or UK-style TIA. Further, on September 21, 2023, the UK Secretary of State for Science, Innovation and Technology established a UK-U.S. data bridge (i.e., a UK equivalent of the Adequacy Decision) and adopted UK regulations to implement the UK-U.S. data. Personal data may now be transferred from the UK under the UK-U.S. data bridge through the UK extension to the DPF to organizations self-certified under the UK extension to the DPF.

As we continue to expand into other foreign countries and jurisdictions, we may be subject to additional laws and regulations that may affect how we conduct business.

Although we work to comply with applicable laws, regulations and standards, our contractual obligations and other legal obligations, these requirements are evolving and may be modified, interpreted and applied in an inconsistent manner from one jurisdiction to another, and may conflict with one another or other legal obligations with which we must comply. Various federal, state and foreign legislative or regulatory bodies may enact new or additional laws and regulations concerning privacy, data-retention and data-protection issues, including laws or regulations mandating disclosure to domestic or international law enforcement bodies, which could adversely impact our business or our reputation with customers. For example, some countries have adopted laws mandating that certain personal information regarding customers in their country be maintained solely in their country. Having to maintain local data centers and redesign product, service and business operations to limit processing of personal information to within individual countries could increase our operating costs significantly. Any failure, or perceived failure, by us to comply with federal, state or international privacy, data-retention or data-protection-related laws, regulations, orders or industry self-regulatory principles could result in proceedings or actions against us by governmental entities or others, a loss of customer confidence, damage to our brand and reputation and a loss of customers, any of which could have an adverse effect on our business.

Evolving expectations around corporate responsibility practices, specifically related to environmental, social and governance ("ESG") matters, may expose us to reputational and other risks.

Investors, stockholders, customers, suppliers and other third parties are increasingly focusing on ESG and corporate social responsibility endeavors and reporting. Companies that do not adapt to or comply with the evolving investor or stakeholder expectations and standards, or that are perceived to have not responded appropriately, may suffer from reputational damage, which could result in the business, financial condition and/or stock price of a company being materially and adversely affected. For example, certain customers have inquired about our ESG practices and may impose ESG guidelines, procurement policies, sustainability standards, mandates or reporting requirements for, and may scrutinize relationships more closely with, their suppliers, including us, which may lengthen sales cycles, increase our costs or impair our ability to attract and retain customers. Further, this increased focus on ESG issues may result in new regulations, international accords and/or third-party requirements that could adversely impact our business, or lead to certain stockholders reducing or eliminating their holdings of our stock. For example, California has passed new laws regarding environmental disclosures that may directly impact us in the future. If we are held to be out of compliance with such laws or other similar laws, we could face penalties and/or reputational harm. We may also be subject to new rules and laws that reflect competing trends in the ESG space, leading to difficulties in compliance. At the same time, certain governmental representatives and other stakeholders have increasingly expressed or pursued opposing views, legislation and investment expectations around sustainability initiatives, including the enactment or proposal of "anti-ESG" legislation or policies. An allegation or perception that we have not taken sufficient action or have taken the wrong actions in these areas could negatively harm our business and reputation.

ITEM 1B. UNRESOLVED STAFF COMMENTS

Not applicable.

ITEM 1C. CYBERSECURITY

Risk Management and Strategy

In the normal course of business, we may collect and store personal information and other sensitive information, including proprietary and confidential business information, trade secrets, intellectual property, sensitive third-party information and employee information. We assess and identify cybersecurity risk to such information by maintaining cybersecurity policies that require continuous monitoring and detection programs and network security precautions. Our program incorporates industry-standard frameworks, policies and practices designed to protect the privacy and security of our sensitive information.

We manage cybersecurity risks by maintaining various protections designed to safeguard against cyberattacks, including firewalls and virus detection software, and periodic end user training on common cybersecurity threats (e.g. phishing exercises and interactive trainings). We have established our disaster recovery plan and we protect against business interruption by backing up our major systems. In addition, we periodically scan our environment for any vulnerabilities, perform penetration testing and engage third parties to assess effectiveness of our data security practices. A third party security consultant conducts regular network security reviews, scans and audits, and we may consult with other external experts as warranted by a particular cybersecurity incident or threat. In addition, we maintain insurance that includes cybersecurity coverage.

Areas of cybersecurity risk are assessed bi-annually, and updates are reported by our Chief Financial Officer to the Board's Audit Committee and senior management annually. Where our bi-annual cybersecurity risk assessment identifies areas for improvement, we document and track our remediation activities, which are also reported to the Audit Committee and senior management annually. In this way, our program to manage cybersecurity risk integrates with our overall risk management processes.

With respect to third parties who provide services affecting critical business management systems, we collect and maintain SOC2 or SOC1 type II reports (attestation of controls at a service organization over a minimum six-month period). For other third-party service providers, cybersecurity risk is addressed as appropriate.

As of the date of this report, we are not aware of any risks from cybersecurity threats that have materially affected or are reasonably likely to materially affect us, including our business strategy, results of operations and financial condition. Despite the implementation of our cybersecurity program, our security measures cannot guarantee that a significant cyberattack will not occur. A successful attack on our information technology systems could have significant consequences to the business. While we devote resources to our security measures to protect our systems and information, these measures cannot provide absolute security. See "Risk Factors – General Risk Factors" for additional information about the risks to our business associated with a breach or compromise to our information technology systems.

Governance

The Company's Board of Directors has visibility into cybersecurity risks through its Audit Committee and through the process described below. The Audit Committee has oversight of the Company's cybersecurity risk management programs and the design and operating effectiveness thereof, and reviews reports from Company management on cybersecurity, data privacy and other risks relevant to the Company's computerized information system controls and security.

Areas of cybersecurity risk are assessed bi-annually, and updates are reported by the Chief Financial Officer to the Audit Committee and senior management annually. Where our bi-annual cybersecurity risk assessment identifies areas for improvement, we document and track our remediation activities, which are also reported to the Audit Committee and senior management annually.

Senior management has appointed a Cybersecurity Council that is responsible for identifying, escalating, and facilitating the assessment and determination of the materiality of cybersecurity incidents and threats. The Cybersecurity Council is made up of representatives of IT, Legal and Finance, as well as ad hoc additional members depending on the circumstances of the incident or threat. The members of the Cybersecurity Council do not have specific expertise in cybersecurity risk other than the Vice President of Information Technology ("VP IT") who has more than 20 years of experience, and engages with trusted third-party experts for support and guidance when additional expertise is required. In December 2024, the VP IT exited the company, and IT expert advice to the Cybersecurity Council is currently provided by an external cybersecurity specialist. This specialist has extensive experience managing cybersecurity functions in his prior external roles, where he was responsible for overseeing cybersecurity strategy and operations, including incident response, threat intelligence, security awareness training programs, risk assessments and remediation, and regulatory and compliance matters.

An actual or suspected cybersecurity incident that jeopardizes the confidentiality, integrity, or availability of Codexis' information systems or any information residing therein (or threat that presents significant risk to our information systems as identified by IT) is reported to the Cybersecurity Council by our IT Department. The focus of the Cybersecurity Council is on the investigation and facilitation of senior management's assessment and determination of materiality of an incident or threat, and such investigation is separate but contemporaneous with the investigation(s) done under other applicable programs, policies, and plans regarding cybersecurity. The Cybersecurity Council will liaise directly with other investigation(s) and share information and assessments. Along with assistance from the Cybersecurity Council as necessary, senior management reports its materiality determination and analysis, including necessary facts to support its determination, to the Audit Committee of the Board of Directors. Pursuant to its charter, the Audit Committee may, along with senior management, report such determination to the Board of Directors.

ITEM 2. PROPERTIES

FACILITIES

Our headquarters are located in Redwood City, California, where we lease approximately 77,300 square feet of office and laboratory space.

Our lease ("RWC Lease") with Metropolitan Life Insurance Company ("MetLife") includes approximately 28,200 square feet of space located at 200 and 220 Penobscot Drive, Redwood City, California (the "200/220 Penobscot Space"), 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 "Chesapeake Space").

We entered into the initial lease with MetLife for our facilities in Redwood City in 2003 and the RWC lease has been amended multiple times since then to adjust the leased space and terms of the RWC Lease. In December 2024, we entered into a Ninth Amendment to the RWC Lease (the "Ninth Amendment") with MetLife with respect to the Penobscot Space and the Chesapeake Space to extend the term of the RWC Lease for additional periods. Pursuant to the Ninth Amendment, the term of the lease for both the Penobscot Space and the Chesapeake Space has been extended through August 2032. 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 Chesapeake Space for five (5) years.

We believe that the facility that we currently lease in Redwood City, California is adequate for our needs for the immediate future and that, should it be needed, additional space can be leased to accommodate any future growth.

ITEM 3. LEGAL PROCEEDINGS

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

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

PART II

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

MARKET INFORMATION

Our common stock is quoted on the Nasdaq Global Select Market ("Nasdaq"), under the symbol "CDXS."

As of February 24, 2025, there were approximately 123 stockholders of record. A substantially greater number of stockholders may be "street name" or beneficial holders, whose shares are held of record by banks, brokers and other financial institutions.

Dividend Policy

We have never declared or paid cash dividends on our common stock, and we currently do not plan to declare dividends on shares of our common stock in the foreseeable future. We expect to retain our future earnings, if any, for use in the operation and expansion of our business. In addition, unless waived, the terms of our five-year term loan and security agreement (the "Loan Agreement") with Innovatus Life Sciences Lending Fund I, LP ("Innovatus") prohibit us from paying any cash dividends or making other distributions. The payment of cash dividends in the future, if any, will be at the discretion of our Board of Directors and will depend upon such factors as earnings levels, capital requirements, our overall financial condition and any other factors deemed relevant by our Board of Directors.

Securities Authorized for Issuance under Equity Compensation Plans

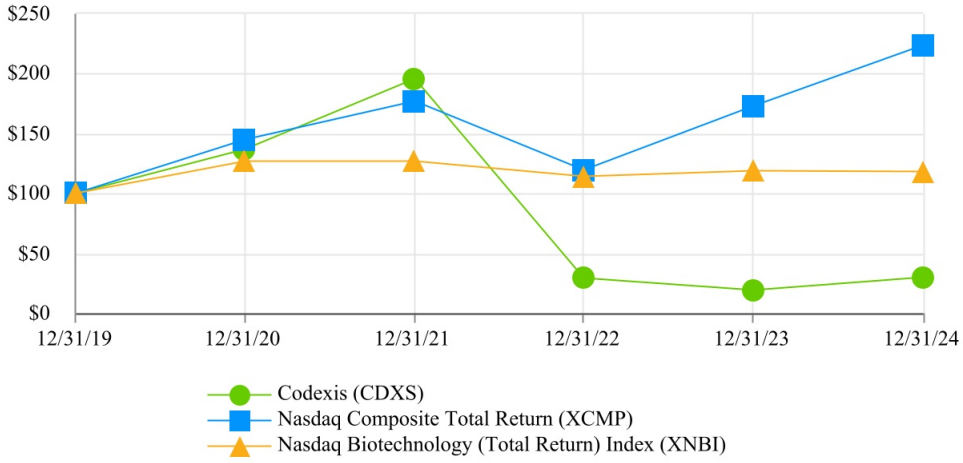
The information required by this item concerning securities authorized for issuance under equity compensation plans is incorporated by reference from the information that will be set forth in the Definitive Proxy Statement to be filed with the Securities and Exchange Commission in connection with the Annual Meeting of Stockholders to be held in 2025 (the "2025 Proxy Statement").

Stock Price Performance Graph

The following tabular information and graph compare our total common stock return with the total return for (i) the Nasdaq Composite Index and (ii) the Nasdaq Biotechnology Total Return Index for the period December 31, 2019 through December 31, 2024. The figures represented below assume an investment of $100 in our common stock at the closing price on December 31, 2019 and in the Nasdaq Composite Index and the Nasdaq Biotechnology Total Return Index on December 31, 2019 and the reinvestment of dividends into shares of common stock. The comparisons in the table and graph are required by the SEC and are not intended to forecast or be indicative of possible future performance of our common stock. The tabular information and graph shall not be deemed "soliciting material" or to be "filed" for purposes of Section 18 of the Exchange Act or otherwise subject to the liabilities under that Section, and shall not be deemed to be incorporated by reference into any of our filings under the Securities Act or the Exchange Act.

		December 31,					
$100 investment in stock or index	**Ticker**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
Codexis, Inc.	CDXS	$ 100.00	$ 136.52	$ 195.56	$ 29.14	$ 19.07	$ 29.83
Nasdaq Composite Total Return	XCMP	$ 100.00	$ 144.92	$ 177.06	$ 119.45	$ 172.78	$ 223.87
Nasdaq Biotechnology (Total Return) Index	XNBI	$ 100.00	$ 126.42	$ 126.45	$ 113.65	$ 118.87	$ 118.20

Comparison of Cumulative Total Return
Among Codexis, Nasdaq Composite Index and Nasdaq Biotechnology Index



Unregistered Sales of Equity Securities and Use of Proceeds

During the year ended December 31, 2024, we did not issue or sell any unregistered securities not previously disclosed in a Quarterly Report on Form 10-Q or in a Current Report on Form 8-K.

Issuer Purchases of Equity Securities

None.

ITEM 6. [RESERVED]

ITEM 7. 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 our audited consolidated financial statements and the related notes thereto included elsewhere in this Annual Report on Form 10-K. This Annual Report on Form 10-K 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 I, Item IA: "Risk Factors," of this Annual Report on Form 10-K and elsewhere in this report. The forward-looking statements in this Annual Report on Form 10-K represent our views as of the date of this Annual Report on Form 10-K. 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 Annual Report on Form 10-K.

Business Overview

We are a leading provider of enzymatic solutions for efficient and scalable therapeutics manufacturing, and we leverage our proprietary CodeEvolver directed evolution technology platform to discover, develop, enhance, and commercialize novel, high-performance enzymes and other classes of proteins. Enzymes are naturally occurring biological molecules critical to almost all biochemical reactions that sustain life. They can be precisely engineered and optimized for specific functions, and to have particular characteristics, such as an ability to survive environments in which natural enzymes cannot, or to perform (bio)chemical transformations different than those for which they naturally evolved. We focus on leveraging our technology and capacity to enhance the properties and performance of enzymes to drive pivotal improvements in manufacturing of complex therapeutics across two key focus areas: our foundational, revenue-generating pharma biocatalysis business and our Enzyme-Catalyzed Oligonucleotide (ECO) Synthesis ("ECO Synthesis") manufacturing platform, which is comprised of enzymatic tools and processes, designed to enable large-scale manufacture of RNA interference ("RNAi") therapeutics. In July 2023, we announced that we discontinued investment in certain development programs, primarily in our novel biotherapeutics business segment. As part of this strategic prioritization, during 2024, we completed the divestiture and monetization of certain biotherapeutics assets as well as certain non-core life science assets, including in genomics and next generation sequencing applications.

In our revenue-generating pharma biocatalysis business (formerly our pharmaceuticals manufacturing business), we utilize our CodeEvolver technology platform to develop optimized enzymes that are used by some of the world's largest pharmaceutical companies to improve the efficiency and productivity of their manufacturing processes for small molecule therapeutics. Our unique enzymes drive improvements such as higher yields, increased purity, reduced energy usage and waste generation, all of which lead to improved efficiency and reduced costs in small-molecule manufacturing.

We also use the CodeEvolver platform technology to develop enzymes for the synthesis of RNAi therapeutics through our ECO Synthesis manufacturing platform, where our enzymes are poised to deliver many of the same benefits we offer in pharma biocatalysis across purity, yield, and improved manufacturing efficiency. In November 2024, we presented data at the TIDES EU conference demonstrating the successful end-to-end enzymatic synthesis of an entire commercially approved siRNA therapeutic asset with the ECO Synthesis manufacturing platform. In addition to using full enzymatic sequential synthesis, adding one nucleotide at time to synthesize the two strands from beginning to end, we demonstrated synthesis of the same siRNA asset using three other routes utilizing enzymatic ligation with our double-stranded RNA ("dsRNA") ligase, which can stitch together fragments of chemically and/or enzymatically synthesized RNA to form the full siRNA drug structure. For the three other routes, our data highlighted that full-length oligos of equal quality and yields were obtained whether the fragments were made with enzymes or by traditional phosphoramidite chemistry. At the end of 2024, we completed the build-out of our ECO Synthesis Innovation Lab, a facility that uses our ECO Synthesis manufacturing platform to synthesize gram-scale quantities of a customer's desired siRNA construct suitable for pre-clinical testing. In 2025, we expect to manufacture good laboratory practice ("GLP")-grade siRNA for customers in our Innovation Lab under development services contracts model, and we anticipate entering a partnership with a large-scale contract development and manufacturing organization ("CDMO") to use our ECO Synthesis platform of enzymatic tools and processes to synthesize good manufacturing practices ("GMP")-grade siRNA drug substance for our customers. We expect to expand our enzymatic tools and process offering as further enhance the ECO Synthesis manufacturing platform to address the overall market needs for scalable and sustainable RNAi manufacturing.

Recent Developments

Finalized Acquisition and License Agreement for certain non-core Life Sciences assets

In line with our strategy relating to non-core Life Sciences assets, in January 2025 we sold assets that were developed under the seqWell Agreement to seqWell in exchange for the right to receive a cash payment upon future events and a warrant to purchase seqWell's common stock exercisable upon future events, and terminated the seqWell Agreement.

Strengthened Board of Directors with new appointments

We announced the appointment of Raymond De Vré, PhD, to our Board of Directors on November 12, 2024, followed by the appointment of Christos Richards on January 16, 2025.

Financing Activities

In May 2021, we filed a Registration Statement on Form S-3 with the SEC, that automatically became effective upon its filing, 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. On February 27, 2023, we filed a post-effective amendment to that Registration Statement on Form S-3. Pursuant to that post-effective amendment, we registered an aggregate $200.0 million of securities. 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 determined from time to time, may have sold 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 was permitted to 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 (the "Securities Act"). We were not required to sell any shares at any time during the term of the EDA. On April 24, 2024, we terminated the EDA. No shares of our common stock were issued and sold pursuant to the EDA during the year ended December 31, 2024. During the year ended December 31, 2023, 3,079,421 shares of our common stock were issued and sold pursuant to the EDA for gross proceeds of $8.7 million, or $7.9 million in net proceeds after PSC's commissions and direct offering expenses of $0.7 million.

On May 2, 2024, we entered into a Controlled Equity Offering℠ Sales Agreement (the "Cantor Sales Agreement") with Cantor Fitzgerald & Co., as sales agent ("Cantor"), under which Cantor, at our discretion and at such times that we may determine from time to time, may sell up to a maximum of $75.0 million of shares of our common stock. Under the terms of the Cantor Sales Agreement, Cantor 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. On May 2, 2024, we filed a registration statement on Form S-3 registering the offer and sale of these shares under the Securities Act which became effective on May 14, 2024. We will pay a commission of up to 3.0% of gross sales proceeds of any common stock sold under the Cantor Sales Agreement. During the year ended December 31, 2024, 10,440,000 shares of our common stock were issued and sold pursuant to the Cantor Sales Agreement and we received gross proceeds of $31.3 million, or $29.7 million in net proceeds after Cantor's commissions and direct offering expenses of $1.6 million. As of December 31, 2024, $43.7 million remained available for sale under the Cantor Sales Agreement.

On February 13, 2024, we entered into the Loan Agreement with Innovatus consisting of up to two tranches, of which the first tranche of $30.0 million was disbursed upon execution of the Loan Agreement. We will be eligible to draw on the second tranche of $10.0 million upon achievement of certain milestones including certain pre-specified revenue thresholds and subject to payment of a facility fee equal to 1.00% of the amount of such term loan. The Term Loan carries an interest-only period of 36 months (with the possibility to extend up to 48 months upon achievement of certain pre-specified financial milestones) and will bear interest at a floating rate of the sum of (a) the greater of (i) prime rate and (ii) 7.50%, plus (b) 3.25%.

RESULTS OF OPERATIONS

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

	Year Ended December 31,			% of Total Revenues		
	2024	2023	2022	2024	2023	2022
Revenues:						
Product revenue	$ 36,786	$ 42,906	$ 116,676	62 %	61 %	84 %
Research and development revenue	22,559	27,237	21,914	38 %	39 %	16 %
Total revenues	59,345	70,143	138,590	100 %	100 %	100 %
Costs and operating expenses:						
Cost of product revenue	16,288	12,809	38,033	27 %	18 %	27 %
Research and development	46,263	58,885	80,099	78 %	84 %	58 %
Selling, general and administrative	55,148	53,250	52,172	93 %	76 %	38 %
Restructuring charges	—	3,284	3,167	— %	5 %	2 %
Asset impairment and other charges	165	9,984	—	— %	14 %	— %
Total costs and operating expenses	117,864	138,212	173,471	199 %	197 %	125 %
Loss from operations	(58,519)	(68,069)	(34,881)	(99)%	(97)%	(25)%
Interest income	3,670	4,172	1,441	6 %	6 %	1 %
Interest and other expense, net	(10,393)	(12,274)	124	(18)%	(17)%	— %
Loss before income taxes	(65,242)	(76,171)	(33,316)	(111)%	(108)%	(24)%
Provision for income taxes	34	69	276	— %	— %	— %
Net loss	$ (65,276)	$ (76,240)	$ (33,592)	(111)%	(108)%	(24)%

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):

	Year Ended December 31,			Change			
				2024		2023	
	2024	2023	2022	$	%	$	%
Product revenue	$ 36,786	$ 42,906	$ 116,676	$ (6,120)	(14)%	$ (73,770)	(63)%
Research and development revenue	22,559	27,237	21,914	(4,678)	(17)%	5,323	24 %
Total revenues	$ 59,345	$ 70,143	$ 138,590	$ (10,798)	(15)%	$ (68,447)	(49)%

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.

2024 compared to 2023

Total revenues decreased by $10.8 million in 2024 to $59.3 million, as compared to 2023. The decrease was driven by lower product revenue and lower research and development revenue as compared to the prior year.

Product revenue was $36.8 million in 2024, a decrease of 14% compared with $42.9 million in 2023. The decrease in product revenue was primarily due to one-time revenue recognition of $8.2 million in 2023 related to Pfizer's fee previously received under the Enzyme Supply Agreement with Pfizer Ireland Pharmaceuticals, a subsidiary of Pfizer, Inc., a $2.9 million decrease due to the early termination of an enzyme supply agreement with a customer in 2023, and the one-time recognition of a $1.3 million settlement fee in 2023 under the same enzyme supply agreement. This decrease was partially offset with higher sales of branded pharmaceutical products in 2024.

Research and development revenue decreased by $4.7 million in 2024 to $22.6 million, or 17% compared with $27.2 million in 2023. The decrease was primarily due to $9.1 million lower research and development fees from Nestlé Health Science ("Nestlé"), the one-time recognition of $5.0 million revenue related to a license agreement in 2023 and $2.0 million lower revenue from our master service agreements with Pfizer Inc. ("Pfizer"), $1.2 million lower revenue from Takeda Pharmaceutical Co. Ltd. under a Strategic Collaboration and License Agreement, and $4.3 million lower revenue from other legacy collaboration agreements. This decrease was offset by $6.0 million higher revenue from our licensing agreement with Roche Sequencing Solutions, Inc. ("Roche") entered into in February 2024, recognition of $9.5 million revenue related to a license agreement with Pfizer entered into in December 2024, and $1.9 million higher revenue from existing collaboration agreements.

2023 compared to 2022

Total revenues decreased by $68.4 million in 2023 to $70.1 million, as compared to 2022. The decrease was driven by lower product revenue as compared to the prior year.

Product revenue was $42.9 million in 2023, a decrease of 63% compared with $116.7 million in 2022. The decrease in product revenue was primarily due to decreased sales of CDX-616 to Pfizer. This decrease was partially offset by $8.2 million release of prior year's deferrals related to Pfizer's fee, $3.2 million release of prior periods' product revenue deferrals due to early termination of the enzyme supply obligations to a customer and $1.3 million of product revenue recognized as settlement fee pursuant to the enzyme supply agreement with the same customer.

Research and development revenue increased by $5.3 million in 2023 to $27.2 million, or 24% compared with $21.9 million in 2022, primarily due to higher revenue from a 2023 Pfizer license agreement and from Nestlé Health Science under a Strategic Collaboration Agreement with Nestlé (the "Nestlé SCA") and development agreement and an acquisition agreement with Nestlé (the "Acquisition Agreement"), which was partially offset by lower research and development fees from existing collaboration agreements being recognized in 2023 as compared to the prior year.

Costs and Operating Expenses (in thousands, except percentages):

	Year Ended December 31,			Change			
				2024		2023	
	2024	2023	2022	$	%	$	%
Cost of product revenue	$ 16,288	$ 12,809	$ 38,033	$ 3,479	27 %	$ (25,224)	(66)%
Research and development	46,263	58,885	80,099	(12,622)	(21)%	(21,214)	(26)%
Selling, general and administrative	55,148	53,250	52,172	1,898	4 %	1,078	2 %
Restructuring charges	—	3,284	3,167	(3,284)	(100)%	117	4 %
Asset impairment and other charges	165	9,984	—	(9,819)	(98)%	9,984	100 %
Total costs and operating expenses	$ 117,864	$ 138,212	$ 173,471	$ (20,348)	(15)%	$ (35,259)	(20)%

Costs of Product Revenue and Product Gross Margin

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

	Year Ended December 31,		Change		Year Ended December 31,		Change	
	2024	2023	$	%	2023	2022	$	%
Product revenue	$ 36,786	$ 42,906	$ (6,120)	(14)%	$ 42,906	$ 116,676	$ (73,770)	(63)%
Cost of product revenue[1]	16,288	12,809	3,479	27 %	12,809	38,033	(25,224)	(66)%
Product gross profit	$ 20,498	$ 30,097	$ (9,599)	(32)%	$ 30,097	$ 78,643	$ (48,546)	(62)%
Product gross margin (%)[2]	56 %	70 %			70 %	67 %		

[1] Cost of product revenue comprises 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.

2024 compared to 2023

Cost of product revenue increased by $3.5 million in 2024 to $16.3 million, as compared to 2023. The increase was primarily due to the combination of increased sales of certain enzyme product and higher costs. Product gross margins decreased to 56% in 2024 as compared to 70% in 2023, primarily due to variability in the product mix and with 2023 benefiting from product revenue recognized with no related cost in 2023 related to the utilization of Pfizer's fee and to the early termination of an enzyme supply agreement with a customer.

2023 compared to 2022

Cost of product revenue decreased by $25.2 million in 2023 to $12.8 million, as compared to 2022. The decrease was primarily due to lower volume of product sales as compared to the prior year. Product gross margins increased to 70% in 2023 as compared to 67% in 2022, primarily due to product revenue recognized with no related costs in 2023 related to the utilization of Pfizer's fee and early termination of an enzyme supply agreement with a customer, and was partially offset by variability in the product mix.

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.

2024 compared to 2023

Research and development expenses were $46.3 million in 2024 compared to $58.9 million in 2023, a decrease of $12.6 million, or 21%. This decrease was primarily due to a $4.4 million decrease from lower use of outside services related to Chemistry, Manufacturing and Controls procedures ("CMC") and lower regulatory expense, $4.3 million decrease in costs associated with lower headcount, $3.8 million decrease from lower lease and facilities costs due to the assignment of our San Carlos facility lease during the fourth quarter of 2023, and $0.3 million in lower depreciation expenses. These were partially offset by $0.4 million in higher allocable costs.

2023 compared to 2022

Research and development expenses were $58.9 million in 2023 compared to $80.1 million in 2022, a decrease of $21.2 million, or 26%. This decrease was primarily due to a $10.0 million decrease in costs associated with lower headcount, $6.4 million decrease in outside services and CMC and regulatory expense, $4.1 million in lower lab supplies expense, $1.3 million in lower stock comp expense, and a $1.0 million decrease in lease costs due to the assignment of our San Carlos facility lease. These were partially offset by $1.7 million in higher allocable costs.

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.

2024 compared to 2023

Selling, general and administrative expenses were $55.1 million in 2024 compared to $53.3 million in 2023, an increase of $1.9 million, or 4%. This increase was primarily due to $2.9 million in higher stock-based compensation expense, $0.9 million in higher consulting and outside services, and $0.7 million in higher legal fees. This was partially offset by a $1.9 million in lower payroll-based expenses and $0.7 million in lower allocable expenses.

2023 compared to 2022

Selling, general and administrative expenses were $53.3 million in 2023 compared to $52.2 million in 2022, an increase of $1.1 million, or 2%. This increase was primarily due to $3.6 million in higher payroll-based expenses, $0.6 million in higher legal expense, $0.4 million in higher repairs and maintenance expense, and $0.3 million in higher consulting and outside services. This was partially offset by $3.2 million in lower stock-based compensation expense and $0.4 million in lower allocable expenses.

Restructuring Charges

Restructuring charges consist of employee severance and other termination benefits due to workforce reduction plans that were initiated in the prior years. There were no restructuring charges recognized for the year ended December 31, 2024. Restructuring charges were $3.3 million and $3.2 million for the years ended December 31, 2023, and 2022, respectively.

Asset Impairment and Other Charges

Asset impairment and other charges for the year ended December 31, 2024 were $0.2 million related to a long-lived asset impairment charge in the second quarter of 2024. Asset impairment and other charges for the year ended December 31, 2023 were $10.0 million, consisting of a $9.2 million long-lived asset impairment charge and a $0.8 million goodwill impairment charge, all of which are non-cash charges. No asset impairment charges were recorded for the year ended December 31, 2022.

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

	Year Ended December 31,			Change			
				2024		2023	
	2024	2023	2022	$	%	$	%
Interest income	$ 3,670	$ 4,172	$ 1,441	$ (502)	(12)%	$ 2,731	190 %
Interest and other expense, net	(10,393)	(12,274)	124	1,881	(15)%	(12,398)	(9,998)%
Total other income (expense), net	$ (6,723)	$ (8,102)	$ 1,565	$ 1,379	(17)%	$ (9,667)	(618)%

Interest Income

Interest income decreased by $0.5 million in 2024 compared to 2023, primarily due to lower average cash balances. Interest income increased by $2.7 million in 2023 compared to 2022, primarily due to higher average interest rates on cash balances.

Interest and Other Expense, net

Interest and other expense, net, decreased by $1.9 million in 2024 compared to 2023, primarily due to the higher impairment charges recognized in 2023 related to our investments in Molecular Assemblies, Inc. (“MAI”), seqWell Inc. (“seqWell”) and Arzeda Corp. (“Arzeda”), offset by $3.5 million in interest related to the long-term debt in the current year.

Interest and other expense, net, increased by $12.4 million in 2023 compared to 2022, primarily due to impairment of our investments in MAI, seqWell and Arzeda.

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

	Year Ended December 31,			Change			
				2024		2023	
	2024	2023	2022	$	%	$	%
Provision for income taxes	$ 34	$ 69	$ 276	$ (35)	(51)%	$ (207)	(75)%

The provision for income taxes in 2024 was primarily due to the accrual of interest and penalties on historic uncertain tax positions.

The provision for income taxes in 2023 was primarily for fiscal year 2023 state income taxes and the accrual of interest and penalties on historic uncertain tax positions.

The provision for income taxes in 2022 was primarily due to the income tax withholding imposed by foreign taxing authorities on income earned in certain countries outside of the Unites Stated and remitted to the United States and the accrual of interest and penalties on historic uncertain tax positions, as well as current year state income taxes.

Net Loss

Net loss for 2024 was $65.3 million, or a net loss per basic and diluted share of $0.89. This compared to a net loss of $76.2 million, or $1.12 per basic and diluted share, for 2023. The decrease in net loss was primarily related to lower operating expenses in 2024.

Net loss for 2023 was $76.2 million, or a net loss per basic and diluted share of $1.12. This compared to a net loss of $33.6 million, or $0.51 per basic and diluted share, for 2022. The increase in net loss was primarily related to lower product revenues from CDX-616 and one-time charges recognized during 2023 related to asset impairment, including impairment in our investments in non-marketable equity securities, and restructuring charges, which was partially offset by lower operating expenses in 2023.

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. In addition, pursuant to our Loan Agreement with Innovatus, an affiliate of Innovatus Capital Partners, LLC, we borrowed $30.0 million from Innovatus, as Lender, on February 13, 2024 and may become eligible to borrow up to an additional $10.0 million upon the achievement of certain financial milestones. The Loan Agreement provides for an aggregate principal amount of up to $40.0 million and with a maturity date of February 13, 2029 (the “Innovatus Loan”). 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.

Our primary uses of capital for the foreseeable future, including the next 12 months, are for compensation and related expenses, research and development expenses including manufacturing costs, laboratory and related supplies, legal and other regulatory expenses, and general overhead costs.

The following summarizes our cash and cash equivalents and short-term investments balances and working capital as of December 31, 2024, 2023 and 2022 (in thousands):

	December 31,		
	2024	2023	2022
Cash and cash equivalents	$ 19,264	$ 65,116	$ 113,984
Short-term investments	$ 54,194	$ —	$ —
Working capital	$ 75,124	$ 57,636	$ 113,828

Sources of Capital

In addition to our existing cash and cash equivalents, short-term investments and revenue generated through our existing operations, we are eligible to earn milestone and other contingent payments for the achievement of defined collaboration objectives 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.

We have historically experienced negative cash flows from operations as we continue to invest in key technology development projects and improvements to our CodeEvolver technology platform, develop and commercialize new and existing products including our ECO Synthesis manufacturing 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. 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.

Loan Agreement and Term Loans

On February 13, 2024, we entered into the Loan Agreement with Innovatus consisting of up to two tranches, of which the first tranche of $30.0 million was disbursed upon execution of the Loan Agreement. We will be eligible to draw on the second tranche of $10.0 million upon achievement of certain milestones including certain pre-specified revenue thresholds and subject to payment of a facility fee equal to 1.00% of the amount of such term loan. The Term Loan carries an interest-only period of 36 months (with the possibility to extend up to 48 months upon achievement of certain pre-specified financial milestones) and will bear interest at a floating rate of the sum of (a) the greater of (i) prime rate and (ii) 7.50%, plus (b) 3.25%.

Sales Agreements

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. In 2023, 3,079,421 shares of our common stock were issued and sold pursuant to the EDA, all during the first half of 2023, and we received net proceeds of $7.9 million. On April 24, 2024, we terminated the EDA.

On May 2, 2024, we entered into the Cantor Sales Agreement with Cantor, under which Cantor, at our discretion and at such times that we may determine from time to time, may sell up to a maximum of $75.0 million of shares of our common stock. Under the terms of the Cantor Sales Agreement, Cantor 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. On May 2, 2024, we filed a registration statement on Form S-3 registering the offer and sale of these shares under the Securities Act which became effective on May 14, 2024. We will pay a commission of up to 3.0% of gross sales proceeds of any common stock sold under the Cantor Sales Agreement. During the year ended December 31, 2024, 10,440,000 shares of our common stock were issued and sold pursuant to the Cantor Sales Agreement and we received gross proceeds of $31.3 million, or $29.7 million in net proceeds after Cantor's commissions and direct offering expenses of $1.6 million. As of December 31, 2024, $43.7 million of shares remained available for sale under the Cantor Sales Agreement.

Sales of our common stock under the Cantor Sales Agreement 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.

Liquidity

We believe that our existing cash and cash equivalents, combined with our future expectations for product revenues, research and development revenue, and expense management will provide adequate funds for ongoing operations, planned capital expenditures and working capital requirements for at least the next 12 months. We have based this estimate on assumptions that may prove to be wrong, and we could utilize our capital resources sooner than we expect.

However, we may need additional capital if our current plans and assumptions change. In addition, we may choose to seek sources of capital, which may arise through a combination of equity offerings, debt financings, other third-party funding and other collaborations, strategic alliances and partnering arrangements, 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 including our ECO Synthesis manufacturing platform, 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. In addition, under our Loan Agreement, we are subject to restrictive covenants that limit our ability to conduct our business and could be subject to additional covenants to the extent we seek other debt financing in the future. 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 development of new products or services, such as our ECO Synthesis manufacturing platform, 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 the years ended December 31, 2024, 2023 and 2022 (in thousands):

	Year Ended December 31,		
	2024	2023	2022
Net cash provided by (used in) operating activities	$ (49,410)	$ (52,638)	$ 11,284
Net cash used in investing activities	(56,980)	(4,858)	(13,578)
Net cash provided by (used in) financing activities	60,522	8,167	(575)
Net decrease in cash, cash equivalents and restricted cash	$ (45,868)	$ (49,329)	$ (2,869)

Cash Flows from Operating Activities

The $3.2 million decrease in net cash used in operating activities in 2024 as compared to 2023 was primarily due to the net effect of decreases in cash paid from operating expenses, primarily driven by the restructuring of our business in 2023 which included the assignment of our previous San Carlos facility lease in the fourth quarter of 2023, and changes in operating assets and liabilities.

The $63.9 million decrease in net cash provided by operating activities in 2023 as compared to 2022 was primarily due to the net effect of decreases in cash received from our customers due to lower revenue in 2023 and with 2022 benefiting from the receipt of a $25.9 million fee from Pfizer that is creditable against future orders, partially offset by decreases in cash paid for cost of revenues and operating expenses.

Cash Flows from Investing Activities

The $52.1 million increase in net cash used in investing activities in 2024 as compared to 2023 was primarily due to higher cash utilized for purchases of short-term investments, partially offset by lower purchases of property and equipment in the current year.

The $8.7 million decrease in net cash used in investing activities in 2023 as compared to 2022 was primarily due to higher cash utilized for additional investments in equity securities and purchases of property and equipment in the prior year.

Cash Flows from Financing Activities

The $52.4 million increase in net cash provided by financing activities in 2024 as compared to 2023 was primarily due to proceeds from the Innovatus Loan in February 2024 and proceeds from issuance of common stock under the Cantor Sales Agreement in the third quarter of 2024, partially offset by proceeds from issuance of common stock under the EDA during the first half of 2023.

The $8.7 million increase in net cash provided by financing activities in 2023 as compared to 2022 was primarily due to proceeds from issuance of common stock under the EDA and lower cash paid on taxes related to net share settlement of equity awards.

OFF-BALANCE SHEET ARRANGEMENTS

As of December 31, 2024, we had no off-balance sheet arrangements as defined in Item 303 of Regulation S-K as promulgated by the SEC.

CRITICAL ACCOUNTING POLICIES AND ESTIMATES

Management's discussion and analysis of our financial condition and results of operations are based upon our consolidated financial statements. The consolidated financial statements have been prepared in conformity with generally accepted accounting principles in the United States and include our accounts and the accounts of our wholly owned subsidiaries. The preparation of our consolidated financial statements requires our management to make estimates, assumptions, and judgments that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements, and the reported amounts of revenues and expenses during the applicable periods. Management bases its estimates, assumptions and judgments on historical experience and on various other factors that are believed to be reasonable under the circumstances. Different assumptions and judgments would change the estimates used in the preparation of our consolidated financial statements, which, in turn, could change the results from those reported. Our management evaluates its estimates, assumptions and judgments on an ongoing basis.

The critical accounting policies requiring estimates, assumptions, and judgments that we believe have the most significant impact on our consolidated financial statements are described below.

Revenue Recognition

Our revenues are derived primarily from product revenue and collaborative research and development agreements. Some of our contracts with customers contain multiple products and services.

The majority of our collaborative contracts contain multiple revenue streams such as upfront and/or annual license fees, research and development services, contingent milestone payments upon achievement of contractual criteria, and royalty fees based on the licensees' product revenue or usage, among others. We determine the stand-alone selling price ("SSP") and allocate consideration to distinct performance obligations.

We measure revenue based on the consideration specified in the contract with each customer, net of any sales incentives and taxes collected on behalf of government authorities. We recognize revenue in a manner that best depicts the transfer of promised goods or services to the customer, when control of the product or service is transferred to a customer. We make significant judgments when determining the appropriate timing of revenue recognition.

Product Revenue

Certain of our agreements provide options to customers which they can exercise at a future date, such as the option to purchase our product during the contract duration at discounted prices and an option to extend their contract, among others. In accounting for customer options, we determine whether an option is a material right and this requires us to exercise significant judgment. If a contract provides the customer an option to acquire additional goods or services at a discount that exceeds the range of discounts that we typically give for that product or service, or if the option provides the customer certain additional goods or services for free, the option may be considered a material right. If the contract gives the customer the option to acquire additional goods or services at their normal SSPs, we would likely determine that the option is not a material right and, therefore, account for it as a separate performance obligation when the customer exercises the option. We primarily account for options which provide material rights using the alternative approach available under the Accounting Standards Codification ("ASC") 606, as we concluded we meet the criteria for using the alternative approach. Therefore, the transaction price is calculated as the expected consideration to be received for all the goods and services we expect to provide. We update the transaction price for expected consideration, subject to constraint, each reporting period if our estimate of future goods to be ordered by customers change. Estimating expected consideration to be received under the alternative approach involves significant judgment.

Research and Development Revenue

The majority of our research and development agreements are based on a contractual rate per dedicated project team working on the project. The underlying product that we develop for customers does not create an asset with an alternative use to us and the customer receives benefits as we perform the work towards completion. Thus, our performance obligations are generally satisfied over time as the service is performed. We utilize an appropriate method of measuring progress towards the completion of our performance obligations to determine the timing of revenue recognition. For each performance obligation that is satisfied over time, we recognize revenue using a single measure of progress either based on hours incurred or output of services provided.

Our contracts frequently provide customers with rights to use or access our products or technology, along with other promises or performance obligations. If we determine that the customer cannot benefit from the license without our services, the license will be accounted for as combined with the other performance obligations. If we determine that a license is distinct, we would recognize an allocable portion of the transaction price when the license is transferred to the customer, and the customer can use and benefit from it. We estimate the SSP for license rights by using historical information if licenses have been previously sold to customers.

At the inception of each arrangement that includes variable consideration such as development milestone payments, we evaluate whether the milestones are considered probable of being reached and estimate the amount to be included in the transaction price using the most likely amount method. If it is probable that a significant revenue reversal would not occur, the associated milestone value is included in the transaction price. Milestone payments that are not within our control or the licensee, such as regulatory approvals, are not considered probable of being achieved until those approvals are received.

Our CodeEvolver platform technology transfer collaboration agreements typically include license fees, upfront fees, and variable consideration in the form of milestone payments, and sales or usage-based royalties. We have recognized revenues from our platform technology transfer agreements over time.

We also have an agreement under which we have granted a functional license to some elements of our biocatalyst technology. We will recognize revenues for the functional license at a point in time when the control of the license transfers to the customer.

For license agreements that include sales or usage-based royalty payments to us for which the license is the predominant item to which the royalty relates, we do not recognize revenue until the underlying sales of the product or usage has occurred. At the end of each reporting period, we estimate the royalty amount. We recognize revenue at the later of (i) when the related sale of the product occurs, or (ii) when the performance obligation to which some or all of the royalty has been allocated has been satisfied, or partially satisfied.

Investment in Non-Marketable Securities

Investment in Non-Marketable Equity Securities

We measure investments in non-marketable equity securities without a readily determinable fair value using a measurement alternative that measures these securities at the cost method minus impairment, if any, plus or minus changes resulting from observable price changes on a non-recurring basis. Gains and losses on these securities are recognized in interest and other expense, net.

We evaluate equity securities for impairment when circumstances indicate that we may not be able to recover the carrying value. We may impair these securities and establish an allowance for a credit loss when we determine that there has been an "other-than-temporary" decline in estimated fair value of the debt or equity security compared to its carrying value. We calculate the estimated fair value of these securities using information from the investee, which may include:

- Audited and unaudited financial statements;
- Projected technological developments of the company;
- Projected ability of the company to service its debt obligations;
- If a deemed liquidation event were to occur;
- Current fundraising transactions;
- Current ability of the company to raise additional financing if needed;
- Changes in the economic environment which may have a material impact on the operating results of the company;
- Contractual rights, obligations or restrictions associated with the investment; and
- Other factors deemed relevant by our management to assess valuation.

The valuation may be reduced if the company's potential has deteriorated significantly. If the factors that led to a reduction in valuation are overcome, the valuation may be readjusted.

Impairment of Long-Lived Assets

We evaluate the carrying values of long-lived assets, which include property and equipment and right-of-use assets, whenever events, changes in business circumstances or our planned use of long-lived assets indicate that their carrying amounts may not be fully recoverable or that their useful lives are no longer appropriate. If these facts and circumstances exist, we assess for recovery by comparing the carrying values of long-lived assets with the future net undiscounted cash flows expected to be generated by the asset. If such assets are considered to be impaired, the impairment to be recognized is measured by the amount by which the carrying amount of the asset exceeds the fair value of the asset.

Recent Accounting Pronouncements

See Note 2, "Basis of Presentation and Summary of Significant Accounting Policies" in the Notes to the Consolidated Financial Statements set forth in Item 8 of this Annual Report on Form 10-K for a full description of recent accounting standards, including the respective dates of adoption and effects on our consolidated financial position, results of operations and cash flows.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Interest Rate Sensitivity

Our unrestricted cash, cash equivalents, and short-term investments in marketable securities total $73.5 million as of December 31, 2024. We primarily invest these amounts in money market funds and short-term debt which are held for working capital purposes. We do not enter into investments for trading or speculative purposes. As of December 31, 2024, the effect of a hypothetical 10% decrease in market interest rates would have an $0.3 million impact on a potential loss in future interest income and cash flows.

We are also exposed to market risk from changes in interest rates as a result of our indebtedness under the Innovatus Loan. At December 31, 2024, we had $30.0 million principal amount outstanding under the Innovatus Loan. The floating per annum interest rate of the Innovatus Loan is equal to the sum of (a) the greater of (i) prime rate published in the Money Rates section of the Wall Street Journal and (ii) 7.50%, plus (b) 3.25%; provided that, at the election of the Company, up to 2.00% of such rate shall be payable in-kind until the third anniversary of the closing date. An immediate 10% change in the prime interest rate would result in a $0.2 million impact on our results of operations over the next twelve months from December 31, 2024.

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 United States dollar (“USD”) declines in value as compared to the foreign currencies in which we incur expenses, our foreign-currency based expenses increase when translated into USD. Although substantially all of our sales are denominated in USD, 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 interest and 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 December 31, 2024, 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 $40 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 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

Codexis, Inc.

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

Report of Independent Registered Public Accounting Firm

To the Stockholders and Board of Directors
Codexis, Inc.:

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheet of Codexis, Inc. and subsidiaries (the Company) as of December 31, 2024, the related consolidated statement of operations, comprehensive loss, stockholders' equity, and cash flows for the period ended December 31, 2024, and the related notes (collectively, the consolidated financial statements). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2024, and the results of its operations and its cash flows for the period ended December 31, 2024, in conformity with U.S. generally accepted accounting principles.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these consolidated financial statements based on our audit. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audit, we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion.

Our audit included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audit also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audit provides a reasonable basis for our opinion.

Critical Audit Matter

The critical audit matter communicated below is a matter arising from the current period audit of the consolidated financial statements that was communicated or required to be communicated to the audit committee and that: (1) relates to accounts or disclosures that are material to the consolidated financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of a critical audit matter does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

Sufficiency of audit evidence over revenue from contracted customers

As discussed in Note 3 to the consolidated financial statements, the Company recorded $59.3 million of total revenues for the year-ended December 31, 2024 comprised of $36.8 million of product revenue and $22.6 million of research and development revenue. As discussed in Note 2, the Company enters into contracts with customers, some of which contain multiple products and services. Further, the majority of the Company's collaborative contracts, including research and development agreements, contain multiple revenue streams. In determining the appropriate amount of revenue to be recognized for product revenue and research and development revenue, the Company performs the following steps: (i) identification of the promised goods or services in the contract; (ii) determination of whether the promised goods or services are performance obligations, including whether they are distinct in the context of the contract; (iii) measurement of the transaction price, including the constraint on variable consideration; (iv) allocation of the transaction price to the performance obligations based on estimated selling prices; and (v) recognition of revenue when, or as, the Company satisfies each performance obligation.

We identified the evaluation of the sufficiency of audit evidence over revenue as a critical audit matter. Evaluating the sufficiency of audit evidence obtained required subjective auditor judgment due to the volume of revenue streams and disparate nature of contracts with customers, which involved determining the contracts and related revenue transactions to test and evaluating the recognition and measurement of revenue with respect to certain contracts with considerations around multiple elements, material rights, or timing of recognition.

The following are the primary procedures we performed to address this critical audit matter. We applied auditor judgment to determine the nature and extent of procedures to be performed over revenue, including the determination of the types of contracts, transactions and measurement elements to test such as considerations of certain contracts with multiple elements, material rights, and timing of revenue recognition. We read a selection of contracts and evaluated the Company's identification and assessment of the contract terms impacting the recognition and measurement of revenue. For certain transactions, we inspected the terms of the contract, agreed such terms to underlying documentation, such as external and internal evidence as applicable, recalculated revenue based on the underlying documentation, and compared it to the amount of revenue recognized. We evaluated the sufficiency of audit evidence obtained by assessing the results of procedures performed, including the appropriateness of the nature and extent of such evidence.

/s/ KPMG LLP

We have served as the Company's auditor since 2024.

San Francisco, California
February 27, 2025

Report of Independent Registered Public Accounting Firm

Stockholders and Board of Directors
Codexis, Inc.
Redwood City, California

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheet of Codexis, Inc. (the "Company") as of December 31, 2023, the related consolidated statement of operations, stockholders' equity, and cash flows for each of the two years in the period ended December 31, 2023, and the related notes (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2023, and the results of its operations and its cash flows for each of the two years in the period ended December 31, 2023**,** in conformity with accounting principles generally accepted in the United States of America.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's consolidated financial statements based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud.

Our audits included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ BDO USA, P.C.

We served as the Company's auditor from 2013 to 2024.

San Francisco, California
February 28, 2024

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

	December 31,	
	2024	**2023**
Assets		
Current assets:		
Cash and cash equivalents	$ 19,264	$ 65,116
Restricted cash, current	503	519
Short-term investments	54,194	—
Financial assets:		
Accounts receivable	11,920	10,036
Contract assets	4,375	815
Unbilled receivables	2,751	9,142
Total financial assets	19,046	19,993
Less: allowances	(162)	(65)
Total financial assets, net	18,884	19,928
Inventories	1,799	2,685
Prepaid expenses and other current assets	4,128	5,218
Total current assets	98,772	93,466
Restricted cash	1,062	1,062
Investment in non-marketable equity securities	2,798	9,700
Right-of-use assets - Operating leases, net	28,700	13,137
Property and equipment, net	14,197	15,487
Goodwill	2,463	2,463
Other non-current assets	1,019	1,246
Total assets	$ 149,011	$ 136,561
Liabilities and Stockholders' Equity		
Current liabilities:		
Accounts payable	$ 2,838	$ 5,947
Accrued compensation	11,410	11,246
Other accrued liabilities	6,223	4,735
Current portion of lease obligations - Operating leases	2,827	3,781
Deferred revenue	350	10,121
Total current liabilities	23,648	35,830
Deferred revenue, net of current portion	100	640
Long-term lease obligations - Operating leases	28,163	12,243
Long-term debt	28,905	—
Other long-term liabilities	1,268	1,233
Total liabilities	82,084	49,946
Commitments and contingencies (Note 13)		
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; 200,000 shares authorized; 81,850 and 69,905 shares issued and outstanding at December 31, 2024 and December 31, 2023, respectively	8	7
Additional paid-in capital	629,673	584,138
Accumulated other comprehensive income	52	—
Accumulated deficit	(562,806)	(497,530)
Total stockholders' equity	66,927	86,615
Total liabilities and stockholders' equity	$ 149,011	$ 136,561

See accompanying notes to consolidated financial statements

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

	Year Ended December 31,		
	2024	**2023**	**2022**
Revenues:			
Product revenue ($0, $0 and $514 from a related party)	$ 36,786	$ 42,906	$ 116,676
Research and development revenue ($0, $0 and $1,245 from a related party)	22,559	27,237	21,914
Total revenues	59,345	70,143	138,590
Costs and operating expenses:			
Cost of product revenue	16,288	12,809	38,033
Research and development	46,263	58,885	80,099
Selling, general and administrative	55,148	53,250	52,172
Restructuring charges	—	3,284	3,167
Asset impairment and other charges	165	9,984	—
Total costs and operating expenses	117,864	138,212	173,471
Loss from operations	(58,519)	(68,069)	(34,881)
Interest income	3,670	4,172	1,441
Interest and other expense, net ($0, $0 and $208 from a related party)	(10,393)	(12,274)	124
Loss before income taxes	(65,242)	(76,171)	(33,316)
Provision for income taxes	34	69	276
Net loss	$ (65,276)	$ (76,240)	$ (33,592)
Net loss per share, basic and diluted	$ (0.89)	$ (1.12)	$ (0.51)
Weighted average common stock shares used in computing net loss per share, basic and diluted	73,408	68,131	65,344

See accompanying notes to consolidated financial statements

Codexis, Inc.
Consolidated Statements of Comprehensive Loss
(In Thousands)

	Year Ended December 31,		
	2024	**2023**	**2022**
Net loss	$ (65,276)	$ (76,240)	$ (33,592)
Other comprehensive gain:			
Unrealized gain on available-for-sale short-term investments, net of tax	52	—	—
Comprehensive loss	$ (65,224)	$ (76,240)	$ (33,592)

See accompanying notes to consolidated financial statements

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

	Common Stock		Additional Paid-in Capital	Accumulated Other Comprehensive Income (Loss)	Accumulated Deficit	Total Stockholders' Equity
	Shares	Amount				
December 31, 2021	65,109	$ 6	$ 552,083	$ —	$ (387,698)	$ 164,391
Issuance of common stock upon exercise of stock options	410	—	955	—	—	955
Issuance of common stock upon release of stock awards	373	—	—	—	—	—
Stock-based compensation	—	—	14,531	—	—	14,531
Taxes paid related to net share settlement of equity awards	(81)	—	(1,488)	—	—	(1,488)
Net Loss	—	—	—	—	(33,592)	(33,592)
December 31, 2022	65,811	6	566,081	—	(421,290)	144,797
Issuance of common stock upon exercise of stock options	283	—	559	—	—	559
Issuance of common stock upon release of stock awards	796	—	—	—	—	—
Issuance of common stock in connection with an equity sales agreement, net of issuance costs of $721	3,080	1	7,931	—	—	7,932
Stock-based compensation	—	—	9,971	—	—	9,971
Taxes paid related to net share settlement of equity awards	(65)	—	(404)	—	—	(404)
Net Loss	—	—	—	—	(76,240)	(76,240)
December 31, 2023	69,905	7	584,138	—	(497,530)	86,615
Issuance of common stock upon exercise of stock options	399	—	1,291	—	—	1,291
Issuance of common stock upon release of stock awards	842	—	—	—	—	—
Issuance of common stock warrants in connection with debt issuance	—	—	859	—	—	859
Issuance of common stock under employee stock purchase plan	264	—	563	—	—	563
Issuance of common stock in connection with an equity sales agreement, net of issuance costs of $1,584	10,440	1	29,735	—	—	29,736
Stock-based compensation	—	—	13,087	—	—	13,087
Net Loss	—	—	—	—	(65,276)	(65,276)
Other comprehensive loss	—	—	—	52	—	52
December 31, 2024	81,850	$ 8	$ 629,673	$ 52	$ (562,806)	$ 66,927

See accompanying notes to consolidated financial statements

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

	Year Ended December 31,		
	2024	**2023**	**2022**
Operating activities:			
Net loss	$ (65,276)	$ (76,240)	$ (33,592)
Adjustments to reconcile net loss to net cash provided by (used in) operating activities:			
Depreciation and amortization	4,946	5,518	5,402
Reduction in the carrying amount of right-of-use assets	3,184	4,405	4,849
Stock-based compensation	13,087	9,971	14,531
Provision (recovery) for credit losses	97	(65)	4
Asset impairment and other charges	165	9,984	—
Impairment of investment in non-marketable securities	6,902	12,215	—
Equity securities earned from research and development activities ($0, $0, and ($1,245) from a related party)	—	(213)	(1,245)
Unrealized gain on non-marketable securities ($0, $0, and ($208) from a related party)	—	—	(208)
Non-cash interest expense	885	—	—
Amortization of discount on short-term investments	(1,380)	—	—
Other non-cash items	(4)	4	(29)
Changes in operating assets and liabilities:			
Financial assets	1,252	20,247	(3,225)
Inventories	886	(656)	(869)
Prepaid expenses and other assets	893	(865)	181
Accounts payable	(2,567)	2,287	207
Accrued compensation and other accrued liabilities	1,982	(14,041)	5,983
Other long-term liabilities	(4,151)	(5,341)	(5,223)
Deferred revenue	(10,311)	(19,848)	24,518
Net cash provided by (used in) operating activities	(49,410)	(52,638)	11,284
Investing activities:			
Purchase of property and equipment	(4,305)	(4,418)	(8,307)
Proceeds from sale of property and equipment	87	751	29
Purchases of short-term investments	(90,235)	—	—
Proceeds from maturity of short-term investments	35,500	—	—
Proceeds from sale of short-term investments	1,973	—	—
Investment in non-marketable securities	—	(1,191)	(5,300)
Net cash used in investing activities	(56,980)	(4,858)	(13,578)
Financing activities:			
Proceeds from exercises of stock options	1,384	422	955
Proceeds from issuance of stock under employee stock purchase plan	646	—	—
Proceeds from issuance of common stock in connection with equity sales agreements	31,319	8,652	—
Costs incurred in connection with equity sales agreements	(1,706)	(503)	(42)
Proceeds from long-term debt	29,521	—	—
Payment of debt issuance costs	(642)	—	—
Taxes paid related to net share settlement of equity awards	—	(404)	(1,488)
Net cash provided by (used in) financing activities	60,522	8,167	(575)
Net decrease in cash, cash equivalents and restricted cash	(45,868)	(49,329)	(2,869)
Cash, cash equivalents and restricted cash at the beginning of the year	66,697	116,026	118,895
Cash, cash equivalents and restricted cash at the end of the year	$ 20,829	$ 66,697	$ 116,026
Supplemental disclosure of cash flow information:			
Interest paid	$ 2,566	$ 44	$ 34
Income taxes	$ 17	$ 194	$ 100
Supplemental non-cash investing and financing activities:			
Capital expenditures incurred but not yet paid	$ 566	$ 1,068	$ 897

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

	Year Ended December 31,		
	2024	**2023**	**2022**
Cash and cash equivalents	$ 19,264	$ 65,116	$ 113,984
Restricted cash, current and non-current	1,565	1,581	2,042
Total cash, cash equivalents and restricted cash at the end of the period	$ 20,829	$ 66,697	$ 116,026

This table excludes short-term investments of $54.2 million as of December 31, 2024. Total cash, cash equivalents, and short-term investments as of December 31, 2024 were $73.5 million.

See accompanying notes to consolidated financial statements

Codexis, Inc.

Notes to Consolidated Financial Statements

Note 1. Description of Business

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

We discover, develop, enhance, and commercialize novel, high performance enzymes and other classes of proteins leveraging our proprietary CodeEvolver directed evolution technology platform.

We previously managed our business as two business segments, Performance Enzymes and Novel Biotherapeutics. During the third and fourth quarters of 2023, we made changes to the structure of our organization in connection with the restructuring of our business that we announced in July 2023, including the discontinuation of investment in certain development programs, primarily in our biotherapeutics business, consolidation of operations to our Redwood City, California headquarters, and headcount reduction. In connection with these organizational structure changes, corresponding changes were made to how our business is managed, how results are reported internally and how our Chief Executive Officer ("CEO"), our chief operating decision maker, assesses performance and allocates resources. As a result of these changes, our previous Performance Enzymes and Novel Biotherapeutics operating segments were combined into a single reportable segment. Effective October 1, 2023, the Company's operations are managed and reported to the CEO on a consolidated basis. The CEO assesses performance and allocates resources based on the consolidated results of operations. We believe that these changes better align internal resources to create a more efficient and effective organizational structure. Under this new organizational and reporting structure, we managed our business as one reportable segment since the fourth quarter of 2023. Comparative prior period disclosures that reflected the previous two segments' information have been revised to conform to this change in our reportable segment.

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

Basis of Presentation and Principles of Consolidation

The accompanying 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") and include the accounts of Codexis, Inc. and its wholly-owned subsidiaries.

The 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 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, deferred revenue, 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.

Foreign Currency Translation

The USD is the functional currency for our operations outside the United States. Accordingly, non-monetary assets and liabilities originally acquired or assumed in other currencies are recorded in USD at the exchange rates in effect at the date they were acquired or assumed. Monetary assets and liabilities denominated in other currencies are translated into United States dollars at the exchange rates in effect at the balance sheet date. Translation adjustments are recorded in other expense in the consolidated statements of operations. Gains and losses realized from non-USD transactions, including intercompany balances not considered as permanent investments, are included in other expense in the accompanying consolidated statements of operations.

Revenue Recognition

Our revenues are derived primarily from product revenue and collaborative research and development agreements. Some of our contracts with customers contain multiple products and services. We account for individual products and services separately if they are distinct-that is, if a product or service is separately identifiable from other items in the contract and if a customer can benefit from it on its own or with other resources that are readily available to the customer.

In determining the appropriate amount of revenue to be recognized as we fulfill our obligations under our product revenue and collaborative research and development agreements, we perform the following steps: (i) identification of the promised goods or services in the contract; (ii) determination of whether the promised goods or services are performance obligations, including whether they are distinct in the context of the contract; (iii) measurement of the transaction price, including the constraint on variable consideration; (iv) allocation of the transaction price to the performance obligations based on estimated selling prices; and (v) recognition of revenue when (or as) we satisfy each performance obligation.

The majority of our collaborative contracts contain multiple revenue streams such as upfront and/or annual license fees, fees for research and development services, contingent milestone payments upon achievement of contractual criteria, and royalty fees based on the licensees' product revenue or usage, among others. We determine the stand-alone selling price ("SSP") and allocate consideration to distinct performance obligations. Typically, we base our SSPs on our historical sales. If an SSP is not directly observable, then we estimate the SSP taking into consideration market conditions, forecasted sales, entity-specific factors and available information about the customer. We estimate the SSP for license rights by using historical information if licenses have been previously sold to customers.

We account for a contract with a customer when there is approval and commitment from both parties, the rights of the parties are identified, payment terms are identified, the contract has commercial substance and collectability of consideration is probable. Non-cancellable purchase orders received from customers to deliver a specific quantity of product, when combined with our order confirmation, in exchange for future consideration, create enforceable rights and obligations on both parties and constitute a contract with a customer.

We measure revenue based on the consideration specified in the contract with each customer, net of any sales incentives and taxes collected on behalf of government authorities. We recognize revenue in a manner that best depicts the transfer of promised goods or services to the customer, when control of the product or service is transferred to a customer. We make significant judgments when determining the appropriate timing of revenue recognition.

The following is a description of principal activities from which we generate revenue:

Product Revenue

Product revenue consist of sales of biocatalysts, pharmaceutical intermediates and Codex biocatalyst panels and kits. A majority of our product revenue is made pursuant to purchase orders or supply agreements and is recognized either at a point in time when the control of the product has been transferred to the customer which generally aligns with shipping terms, or over time as the product is manufactured because we have a right to payment from the customer under a binding, non-cancellable purchase order, and there is no alternate use of the product for us as it is specifically made for the customer's use.

Certain of our agreements provide options to customers which they can exercise at a future date, such as the option to purchase our product during the contract duration at discounted prices and an option to extend their contract, among others. In accounting for customer options, we determine whether an option is a material right and this requires us to exercise significant judgment. If a contract provides the customer an option to acquire additional goods or services at a discount that exceeds the range of discounts that we typically give for that product or service for the same class of customer, or if the option provides the customer certain additional goods or services for free, the option may be considered a material right. If the contract gives the customer the option to acquire additional goods or services at their normal SSPs, we would likely determine that the option is not a material right and, therefore, account for it as a separate performance obligation when the customer exercises the option. We primarily account for options which provide material rights using the alternative approach available pursuant to the applicable accounting guidance, as we concluded we meet the criteria for using the alternative approach. Therefore, the transaction price is calculated as the expected consideration to be received for all the goods and services we expect to provide under the contract. We update the transaction price for expected consideration, subject to constraint, each reporting period if our estimates of future goods to be ordered by customers change.

Research and Development Revenue

We perform research and development activities as specified in each respective customer agreement. We identify each performance obligation in our research and development agreements at contract inception. We allocate the consideration to each distinct performance obligation based on the SSP of each performance obligation. Performance obligations included in our research and services agreements typically include research and development services for a specified term, periodic reports and small samples of enzyme produced.

The majority of our research and development agreements are based on a contractual rate per dedicated project team working on the project. The underlying product that we develop for customers does not create an asset with an alternative use to us and the customer receives benefits as we perform the work towards completion. Thus, our performance obligations are generally satisfied over time as the service is performed. We utilize an appropriate method of measuring progress towards the completion of our performance obligations to determine the timing of revenue recognition. For each performance obligation that is satisfied over time, we recognize revenue using a single measure of progress either based on hours incurred or output of services provided.

Our contracts frequently provide customers with rights to use or access our products or technology, along with other promises or performance obligations. We must first determine whether the license is distinct from other promises, such as our promise to manufacture a product. If we determine that the customer cannot benefit from the license without our manufacturing capability, the license will be accounted for as combined with the other performance obligations. If we determine that a license is distinct and has significant standalone functionality, we recognize revenues from a functional license at a point in time when the license is transferred to the customer, and the customer can use and benefit from it. We estimate the SSP for license rights by using historical information if licenses have been previously sold to customers.

At the inception of each arrangement that includes variable consideration such as development milestone payments, we evaluate whether the milestones are considered probable of being reached and estimate the amount to be included in the transaction price using the most likely amount method. If it is probable that a significant revenue reversal would not occur, the associated milestone value is included in the transaction price. Milestone payments that are not within our control or the licensee, such as regulatory approvals, are not considered probable of being achieved until those approvals are received. The transaction price is then allocated to each performance obligation on a relative stand-alone selling price basis, for which we recognize revenue as or when the performance obligations under the contract are satisfied. At the end of each subsequent reporting period, we re-evaluate the probability of achievement of such development milestones and any related constraint, and if necessary, adjust our estimate of the overall transaction price. Any such adjustments are recorded on a cumulative catch-up basis, which would affect license, collaboration and other revenues and earnings in the period of adjustment.

Our CodeEvolver technology platform transfer collaboration agreements typically include license fees, upfront fees, and variable consideration in the form of milestone payments, and sales or usage-based royalties. We have recognized revenues from our platform technology transfer agreements over time as our customer uses our technology.

For license agreements that include sales or usage-based royalty payments to us, we do not recognize revenue until the underlying sales of the product or usage has occurred. At the end of each reporting period, we estimate the royalty amount. We recognize revenue at the later of (i) when the related sale of the product occurs, or (ii) when the performance obligation to which some or all of the royalty has been allocated has been satisfied, or partially satisfied.

Practical Expedients, Elections, and Exemptions

We apply certain practical expedients available which permit us not to adjust the amount of consideration for the effects of a significant financing component if, at contract inception, the expected period between the transfer of promised goods or services and customer payment is one year or less.

We perform monthly services under our research and development agreements, and we use a practical expedient permitting us to recognize revenue at the same time that we have the right to invoice our customer for monthly services completed to date.

We have elected to treat shipping and handling activities as fulfillment costs.

We have elected to record revenue net of sales and other similar taxes.

Contract Assets

Contract assets include amounts related to our contractual right to consideration for completed performance obligations not yet invoiced. Contract assets are reclassified to receivables when the rights become unconditional.

Contract Liabilities

Contract liabilities are recorded as deferred revenues and include payments received in advance of performance under the contract. Contract liabilities are realized when the development services are provided to the customer or control of the products has been transferred to the customer. A portion of our contract liabilities relate to supply arrangements that contain material rights that are recognized using the alternative method, under which the aggregate amount invoiced to the customer for shipped products, including contractual fees, is higher than the amount of revenue recognized based on the transaction price allocated to the shipped products.

Contract Costs

We recognize a non-current asset for the incremental costs of obtaining a contract with a customer if the entity expects to recover such costs and if those costs would not have been incurred if the contract had not been obtained, such as commissions paid to sales personnel. We do not typically incur significant incremental costs because the compensation of our salespeople is not based on contracts closed but on a mixture of company goals, individual goals, and sales goals. If a commission paid is directly related to obtaining a specific contract, our policy is to capitalize and amortize such costs on a systematic basis, consistent with the pattern of transfer of the good or service to which the asset relates, and over a period beyond 12 months. Contract costs are reported in other non-current assets and were not significant in any of the periods presented.

Cost of Product Revenue

Cost of product revenue comprises both internal and third party fixed and variable costs including materials and supplies, labor, facilities, and other overhead costs associated with our product sales. Shipping costs are included in our cost of product revenue. Shipping costs were $1.0 million, $1.0 million, and $3.0 million for the years ended December 31, 2024, 2023, and 2022, respectively.

Fulfillment costs, such as shipping and handling, are recognized at a point in time and are included in cost of product revenue.

Cost of Research and Development Services

Cost of research and development services related to services under research and development agreements approximate the research funding over the term of the respective agreements and is included in research and development expense. Costs of services provided under license and platform technology transfer agreements are included in research and development expenses and are expensed in the periods in which such costs are incurred.

Research and Development Expenses

Research and development expenses consist of costs incurred for internal projects and partner-funded collaborative research and development activities, as well as license and platform technology transfer agreements, as mentioned above. These costs include our direct and research-related overhead expenses, which include salaries and other personnel-related expenses (including stock-based compensation), occupancy-related costs, supplies, and depreciation of facilities and laboratory equipment, as well as external costs, and are expensed as incurred. Costs to acquire technologies that are utilized in research and development and that have no alternative future use are expensed when incurred.

Advertising

Advertising costs are expensed as incurred and included in selling, general and administrative expenses in the consolidated statements of operations. Advertising costs were nil, $0.3 million, and $0.3 million for each of the years ended December 31, 2024, 2023 and 2022, respectively.

Stock-Based Compensation

We use the Black-Scholes-Merton option pricing model to estimate the fair value of stock options granted under our equity incentive plans and for our employee stock purchase plan (“ESPP”). The Black-Scholes-Merton option pricing model requires the use of assumptions, including the expected term of the award and the expected stock price volatility. The expected term is based on historical exercise behavior for similar awards, giving consideration to the contractual terms, vesting schedules and expectations of future employee behavior. We use historical volatility to estimate expected stock price volatility. The risk-free rate assumption is based on United States Treasury instruments whose terms are consistent with the expected term of the stock options. The expected dividend assumption is based on our history and expectation of dividend payouts.

Restricted Stock Units (“RSUs”), Restricted Stock Awards (“RSAs”) and performance-contingent restricted stock units (“PSUs”) are measured based on the fair market values of the underlying stock on the dates of grant. Performance based options (“PBOs”) are measured using the Black-Scholes-Merton option pricing model. The vesting of PBOs and PSUs awarded is conditioned upon the attainment of one or more performance objectives over a specified period and upon continued employment through the applicable vesting date. At the end of the performance period, shares of stock subject to the PBOs and PSUs vest based upon both the level of achievement of performance objectives within the performance period and continued employment through the applicable vesting date.

Stock-based compensation expense is calculated based on awards ultimately expected to vest and is reduced for estimated forfeitures at the time of grant and revised, if necessary, in subsequent periods if actual forfeitures differ from those estimates. The estimated annual forfeiture rates for stock options, RSUs, PSUs, PBOs, and RSAs are based on historical forfeiture experience.

The estimated fair value of stock options, RSUs, RSAs and shares to be issued under the ESPP are expensed on a straight-line basis over the vesting term of the grant and the estimated fair value of PSUs and PBOs are expensed using an accelerated method over the term of the award once management has determined that it is probable that the performance objective will be achieved. Compensation expense is recorded over the requisite service period based on management's best estimate as to whether it is probable that the shares awarded are expected to vest. Management assesses the probability of the performance milestones being met on a continuous basis.

Cash and Cash Equivalents

We consider all highly liquid investments with maturity dates of three months or less at the date of purchase to be cash equivalents. Cash and cash equivalents consist of cash on deposit with banks and money market funds. The majority of cash and cash equivalents is maintained with major financial institutions in the United States. Deposits with these financial institutions may exceed the amount of insurance provided on such deposits.

Restricted Cash

We are currently in the process of liquidating our Indian subsidiary. The local legal requirements for liquidation required us to maintain our subsidiary's cash balance in an account managed by a legal trustee to satisfy our financial obligations. This balance is recorded as current restricted cash on the consolidated balance sheets of $0.5 million as of December 31, 2024 and 2023.

Pursuant to the terms of our lease agreements, we obtained letters of credit collateralized by cash deposit balances of $1.1 million as of December 31, 2024 and 2023. These cash deposits balances are recorded as non-current restricted cash on the consolidated balance sheets. For additional information, see Note 13, “Commitments and Contingencies.”

Short-term Investments

We classify all marketable debt securities that have effective maturities of three months or less from the date of purchase as cash equivalents and those with effective maturities of greater than three months as short-term investment securities in the consolidated balance sheets. We determine the appropriate classification of our short-term investments at the time of purchase and reevaluate such designation at each balance sheet date. We have classified and accounted for our short-term investments as available-for-sale. After consideration of our risk versus reward objectives, as well as our liquidity requirements, we may sell these debt securities prior to their effective maturities.

We carry these short-term investments at fair value, and report the unrealized gains and losses, net of taxes, as a component of stockholders’ equity, except for the changes in allowance for expected credit losses, which are included in “Interest and other expense, net” in the consolidated statements of operations. We determine any realized gains or losses on the sale of short-term investments on a specific identification method, and we record such gains and losses as a component of interest income.

Short-term investments are reviewed periodically for allowances for credit losses and impairment. When evaluating the investments, the Company reviews factors such as the extent to which the fair value of the security is less than the amortized cost basis, adverse conditions specifically related to the security, the financial condition of the issuer, the Company’s intent to sell, and whether it would be more likely than not that the Company would be required to sell the investments before the recovery of the amortized cost basis.

Fair Value Measurements

Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. In determining fair value, we utilize valuation techniques that maximize the use of observable inputs and minimize the use of unobservable inputs to the extent possible and we consider counterparty credit risk in our assessment of fair value. Carrying amounts of financial instruments, including cash equivalents, accounts receivable, accounts payable, and accrued liabilities, approximate their fair values as of the balance sheet dates because of their short maturities.

The fair value hierarchy distinguishes between (1) market participant assumptions developed based on market data obtained from independent sources (observable inputs) and (2) an entity's own assumptions about market participant assumptions developed based on the best information available in the circumstances (unobservable inputs). The fair value hierarchy consists of three broad levels, giving the highest priority to unadjusted quoted prices in active markets for identical assets or liabilities (Level 1) and the lowest priority to unobservable inputs (Level 3). The three levels of the fair value hierarchy are described below:

- Level 1: Inputs that are unadjusted, quoted prices in active markets for identical assets or liabilities at the measurement date.
- Level 2: Inputs that are either directly or indirectly observable for the asset or liability through correlation with market data at the measurement date and for the duration of the instrument's anticipated life.
- Level 3: Unobservable inputs that are supported by little or no market activity and that are significant to the fair value of the assets or liabilities and which reflect management's best estimate of what market participants would use in pricing the asset or liability at the measurement date.

Concentrations of Credit Risk

Financial instruments that potentially subject us to significant concentrations of credit risk consist primarily of cash and cash equivalents, accounts receivable and unbilled receivables, contract assets, non-marketable securities, and restricted cash. Cash that is not required for immediate operating needs is invested principally in money market funds. Cash and cash equivalents are invested through banks and other financial institutions in the United States and India. Such deposits in those countries may be in excess of insured limits. The Company has not experienced material losses on its deposits of cash and cash equivalents.

We perform ongoing credit evaluations of our customer's financial condition whenever deemed necessary. We maintain an allowance for doubtful accounts based on the expected collectability of all financial assets, which takes into consideration an analysis of historical bad debts, specific customer creditworthiness and current economic trends. As of December 31, 2024, we had four customers that accounted for 56% of our accounts receivable balance. As of December 31, 2023, four customers accounted for 58% of our accounts receivable balance. We believe the accounts receivable balances from our largest customers do not represent a significant credit risk, based on cash flow forecasts, balance sheet analysis, and past collection experience.

Financial Assets and Allowances

We currently sell enzymes primarily to pharmaceutical and fine chemicals companies throughout the world by the extension of trade credit terms based on an assessment of each customer's financial condition. Trade credit terms are generally offered without collateral and may include an insignificant discount for prompt payment for specific customers. To manage our credit exposure, we perform ongoing evaluations of our customers' financial conditions. In addition, accounts receivable include amounts owed to us under our collaborative research and development agreements.

We recognize accounts receivable at invoiced amounts and we maintain a valuation allowance for credit losses using an impairment model (known as the "current expected credit loss model" or "CECL") based on estimates and forecasts of future conditions requiring recognition of a lifetime of expected credit losses at inception on our financing receivables measured at amortized costs which consisted of accounts receivable, contract assets, and unbilled receivables. We have determined that our financing receivables share similar risk characteristics including: (i) customer origination in the pharmaceutical and fine chemicals industry, (ii) similar historical credit loss pattern of customers (iii) no meaningful trade receivable differences in terms, (iv) similar historical credit loss experience and (v) our belief that the composition of certain assets are comparable to our historical portfolio used to develop loss history. As a result, we measured the allowance for credit loss ("ACL") on a collective basis. Our ACL methodology considers how long the asset has been past due, the financial condition of the customers, which includes ongoing quarterly evaluations and assessments of changes in customer credit ratings, and other market data that we believe are relevant to the collectability of the assets. Nearly all financing receivables are due from customers that are highly rated by major rating agencies and have a long history of no credit loss. We derive our ACL by establishing an impairment rate attributable to assets not yet identified as impaired.

Unbilled Receivable

The timing of revenue recognition may differ from the timing of invoicing to our customers. When we satisfy (or partially satisfy) a performance obligation, prior to being able to invoice the customer, we recognize an unbilled receivable when the right to consideration is unconditional.

Inventories

Inventories are stated at the lower of cost or net realizable value. Cost is determined using a weighted-average approach, assuming full absorption of direct and indirect manufacturing costs, or based on cost of purchasing from our vendors. If inventory costs exceed expected net realizable value due to obsolescence or lack of demand, valuation adjustments are recorded for the difference between the cost and the expected net realizable value.

Concentrations of Supply Risk

We rely on a limited number of suppliers for our products. We believe that other vendors would be able to provide similar products; however, the qualification of such vendors may require substantial start-up time. In order to mitigate any adverse impacts from a disruption of supply, we attempt to maintain an adequate supply of critical single-sourced materials. For certain materials, our vendors maintain a supply for us. We outsource the large-scale manufacturing of our products to contract manufacturers with facilities in Austria and Italy.

Property and Equipment

Property, equipment and leasehold improvements are stated at cost less accumulated depreciation and amortization calculated using the straight-line method over their estimated useful lives as follows:

Asset classification	Estimated useful life
Laboratory equipment	5 years
Computer equipment and software	3 years
Office equipment and furniture	5 years
Leasehold improvements	Lesser of useful life or lease term

Property and equipment classified as construction in process includes equipment that has been received but not yet placed in service. Normal repairs and maintenance costs are expensed as incurred.

Impairment of Long-Lived Assets

We evaluate the carrying values of long-lived assets, which include property and equipment and right-of-use assets, whenever events, changes in business circumstances or our planned use of long-lived assets indicate that their carrying amounts may not be fully recoverable or that their useful lives are no longer appropriate. If these facts and circumstances exist, we assess for recovery by comparing the carrying values of long-lived assets with their future net undiscounted cash flows expected to be generated by the asset. If such assets are considered to be impaired, the impairment to be recognized is measured by the amount by which the carrying amount of the asset exceeds the fair value of the asset. For additional information on the impairment charge recorded for the years ended December 31, 2024 and 2023, see Note 8, “Balance Sheet Details” and Note 13, “Commitments and Contingencies.” No impairment charges for long-lived assets were recorded during the year ended December 31, 2022.

Investment in Non-Marketable Equity Securities

We measure investments in non-marketable equity securities without a readily determinable fair value using a measurement alternative that measures these securities at the cost method minus impairment, if any, plus or minus changes resulting from observable price changes on a non-recurring basis. Gains and losses on these securities are recognized in interest and other expense, net.

We evaluate equity securities for impairment when circumstances indicate that we may not be able to recover the carrying value. We may impair these securities and establish an allowance for a credit loss when we determine that there has been an “other-than-temporary” decline in the estimated fair value of the equity security compared to its carrying value. We calculate the estimated fair value of these securities using information from the investee, which may include:

- Audited and unaudited financial statements;
- Projected technological developments of the company;
- Projected ability of the company to service its debt obligations;
- If a deemed liquidation event were to occur;
- Current fundraising transactions;

- Current ability of the company to raise additional financing if needed;
- Changes in the economic environment which may have a material impact on the operating results of the company;
- Contractual rights, obligations or restrictions associated with the investment; and
- Other factors deemed relevant by our management to assess valuation.

The valuation may be reduced if the company's potential has deteriorated significantly. If the factors that led to a reduction in valuation are overcome, the valuation may be readjusted. For additional information on the impairment charge recorded for the year ended December 31, 2024 and 2023, see Note 6, “Investments in Non-Marketable Securities.”

Goodwill

Goodwill represents the excess of the consideration transferred over the fair value of net assets of businesses acquired and is assigned to reporting units. We test goodwill for impairment, considering, among other factors, whether there have been sustained declines in our share price. If we conclude it is more likely than not that the fair value is less than its carrying amount, a quantitative fair value test is performed. Goodwill had a carrying value of $2.5 million as of December 31, 2024 and 2023.

We test goodwill for impairment annually, on the last day of the fourth fiscal quarter, and between annual tests if events and circumstances indicate it is more likely than not that the fair value is less than its carrying amount. The annual impairment test is completed using either: a qualitative “Step 0” assessment based on reviewing relevant events and circumstances; or a quantitative “Step 1” assessment, which determines the fair value. To the extent the carrying amount is less than its estimated fair value, an impairment charge is recorded. Using a relative fair value allocation methodology for assets and liabilities, we compare the carrying amount of net assets and the goodwill to its fair value. If the fair value exceeds its carrying amount, goodwill is considered not impaired. Any excess carrying amount of goodwill over its fair value is recognized as an impairment. No impairment charges related to goodwill were recognized in 2024. We recorded impairment charges related to goodwill of $0.8 million for the year ended December 31, 2023. For additional information on the impairment charge recorded in 2023, see Note 8, “Balance Sheet Details.”

Lease Accounting

We determine if an arrangement is a lease at inception. Where an arrangement is a lease, we determine if it is an operating lease or a finance lease. At lease commencement, we record a lease liability and ROU asset. Lease liabilities represent the present value of our future lease payments over the expected lease term which includes options to extend or terminate the lease when it is reasonably certain those options will be exercised. The present value of our lease liability is determined using our incremental collateralized borrowing rate at lease inception. ROU assets represent our right to control the use of the leased asset during the lease and are recognized in an amount equal to the lease liability for leases with an initial term greater than 12 months. Over the lease term, we use the effective interest rate method to account for the lease liability as lease payments are made and the ROU asset is amortized to the consolidated statement of operations in a manner that results in straight-line expense recognition. We do not apply lease recognition requirements for short-term leases. Instead, we recognize payments related to these arrangements in the consolidated statement of operations as lease costs on a straight-line basis over the lease term.

Income Taxes

We use the liability method of accounting for income taxes, whereby deferred tax asset or liability account balances are calculated at the balance sheet date using current tax laws and rates in effect for the year in which the differences are expected to affect taxable income. Valuation allowances are provided when necessary to reduce deferred tax assets to the amount that will more likely than not be realized.

We make certain estimates and judgments in determining income tax expense for financial statement purposes. These estimates and judgments occur in the calculation of tax credits, benefits and deductions and in the calculation of certain tax assets and liabilities, which arise from differences in the timing of recognition of revenues and expenses for tax and financial statement purposes. Significant changes to these estimates may result in an increase or decrease to our tax provision in a subsequent period.

In assessing the realizability of deferred tax assets, we consider whether it is more likely than not that some portion or all of the deferred tax assets will be realized on a jurisdiction by jurisdiction basis. The ultimate realization of deferred tax assets is dependent upon the generation of taxable income in the future. In the event that it is determined that these deferred tax assets are not more likely than not to be realized, a valuation allowance is recorded against these deferred tax assets. As of December 31, 2024 and 2023, we maintain a full valuation allowance in all jurisdictions against the net deferred tax assets as we believe that it is more likely than not that the majority of deferred tax assets will not be realized.

We make estimates and judgments about our future taxable income that are based on assumptions that are consistent with our plans and estimates. Should the actual amounts differ from our estimates, the amount of our valuation allowance may be materially impacted. Any adjustment to the deferred tax asset valuation allowance would be recorded in the statements of operations for the periods in which the adjustment is determined to be required.

We account for uncertainty in income taxes as required by the provisions of Accounting Standards Update ("ASU") 2009-06, *Income Taxes (Topic 740) Implementation Guidance on Accounting for Uncertainty in Income Taxes and Disclosure Amendments for Nonpublic Entities*, which clarifies the accounting for uncertainty in income taxes recognized in an enterprise's financial statements. The first step is to evaluate the tax position for recognition by determining if the weight of available evidence indicates that it is more likely than not that the position will be sustained on audit, including resolution of related appeals or litigation processes, if any. The second step is to estimate and measure the tax benefit as the largest amount that is more than 50% likely of being realized upon ultimate settlement. It is inherently difficult and subjective to estimate such amounts, as this requires us to determine the probability of various possible outcomes. We consider many factors when evaluating and estimating our tax positions and tax benefits, which may require periodic adjustments and may not accurately anticipate actual outcomes.

The Tax Reform Act of 1986 and similar state provisions limit the use of net operating loss ("NOL") carryforwards in certain situations where equity transactions result in a change of ownership as defined by Internal Revenue Code Section 382. In the event we should experience such a change of ownership, utilization of our federal and state NOL carryforwards could be limited.

Accounting Pronouncements

Recently adopted accounting pronouncements

In November 2023, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") No. 2023-07, *Segment Reporting (Topic 280): Improvements to Reportable Segment Disclosures*. The amendments in the ASU are intended to improve reportable segment disclosure requirements primarily through enhanced disclosures about significant segment expenses. The standard is effective for fiscal years beginning after December 15, 2023, and interim periods within fiscal years beginning after December 15, 2024, with early adoption permitted. The standard should be applied retrospectively to all prior periods presented in the financial statements. The Company adopted ASU No. 2023-07 during the year ended December 31, 2024. For additional information, see Note 15, "Segment, Geographical and Other Revenue Information."

Aside from those recently issued accounting pronouncements adopted and described above and not yet adopted and described below, there have not been any recent accounting pronouncements or changes in accounting pronouncements during the year ended December 31, 2024 that are of significance or potential significance to us.

Recently issued accounting pronouncements not yet adopted

In November 2024, the FASB issued ASU No. 2024-03, *Income Statement-Reporting Comprehensive Income-Expense Disaggregation Disclosures (Subtopic 220-40): Disaggregation of Income Statement Expenses.* The amendment in the ASU will require additional disclosures and disaggregation of certain costs and expenses presented on the face of the income statement. This guidance is effective for the Company for fiscal years beginning after December 15, 2026. Early adoption is permitted. We are currently evaluating the effects of the standard on our consolidated financial statements and related disclosures.

In March 2024, the FASB issued ASU No. 2024-02, *Codification Improvements - Amendments to Remove References to the Concepts Statements*. The amendments in the ASU amends the FASB Accounting Standard Codification (the "ASC") to remove references to various concepts statements and impacts a variety of topics in the ASC. This ASU is effective for public companies with annual periods beginning after December 15, 2024, with early adoption permitted. If an entity adopts the amendments in an interim period, it must adopt them as of the beginning of the fiscal year that includes that interim period. We are currently evaluating the effects of the standard on our consolidated financial statements and related disclosures.

In December 2023, FASB issued ASU No. 2023-09, *Income Taxes (Topic 740): Improvements to Income Tax Disclosures*. The amendments in the ASU require public companies, on an annual basis, to provide disclosures of specific categories in the rate reconciliation, as well as disclosure of income taxes paid disaggregated by jurisdiction. This ASU is effective for public companies with annual periods beginning after December 15, 2024, with early adoption permitted. We are currently evaluating the effects of the standard on our consolidated financial statements and related disclosures.

In October 2023, FASB issued ASU No. 2023-06, *Disclosure Improvements: Codification Amendments in Response to the SEC's Disclosure Update and Simplification Initiative*. The amendments in the ASU are intended to amend certain disclosure and presentation requirements for a variety of topics within the ASC. These amendments align the requirements in the ASC to the removal of certain disclosure requirements set out in Regulation S-X and Regulation S-K, as announced by the SEC. The effective date for each amended topic in the ASC is either the date on which the SEC's removal of the related disclosure requirement from Regulation S-X or Regulation S-K becomes effective, or on June 30, 2027, if the SEC has not removed the requirements by that date. Early adoption is prohibited. We are currently evaluating the effects of the standard on our consolidated financial statements and related disclosures.

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. 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).

Disaggregated information is as follows (in thousands):

	Year Ended December 31,		
	2024	**2023**	**2022**
Major products and service:			
Product revenue	$ 36,786	$ 42,906	$ 116,676
Research and development revenue	22,559	27,237	21,914
Total revenues	$ 59,345	$ 70,143	$ 138,590
Primary geographical markets:			
Americas	$ 21,278	$ 13,733	$ 17,000
EMEA	10,359	22,907	56,540
APAC	27,708	33,503	65,050
Total revenues	$ 59,345	$ 70,143	$ 138,590

For additional information regarding revenue disaggregated by geography, see Note 15, "Segment, Geographical and Other Revenue Information."

Contract Balances

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

	December 31, 2024	**December 31, 2023**
Contract assets	$ 4,375	$ 815
Unbilled receivables	$ 3,208	$ 9,904
Contract liabilities: deferred revenue	$ 450	$ 10,761

We recognize accounts receivable when we have an unconditional right to recognize revenue and have issued an invoice to the customer. Our payment terms are generally between 30 and 90 days. We recognize unbilled receivables when we have an unconditional right to recognize revenue and have not issued an invoice to our customer. Unbilled receivables are transferred to accounts receivable on issuance of an invoice. Unbilled receivables are classified separately on the consolidated balance sheets as an asset. We maintain an allowance for credit losses on accounts receivables and unbilled receivables. As of December 31, 2024, we have $2.8 million of short-term unbilled receivables presented as unbilled receivables within current assets and $0.5 million of long-term unbilled receivables that is included within the other non-current assets line item in the consolidated balance sheets. As of December 31, 2023, we had $9.1 million of short-term unbilled receivables presented as unbilled receivables within current asset and $0.8 million of long-term unbilled receivables that is included within the other non-current assets line item in the consolidated balance sheets.

Contract assets represent our right to recognize revenue for custom products with no alternate use and under binding non-cancellable contracts and are largely related to our procurement of product. We recognize contract assets when we have a conditional right to recognize revenue. The transfer of control of certain products occurs in advance of the invoicing process, which generates contract assets. In addition, we recognize a contract asset related to milestones when we assess it is probable of being achieved and there will be no significant reversal of cumulative revenues. Contract assets are classified separately on the consolidated balance sheets as an asset and transferred to accounts receivables when our rights to payment become unconditional.

Contract liabilities, or deferred revenue, represent our obligation to transfer a product or service to the customer, and for which we have received consideration from the customer. We recognize a contract liability when we receive advance customer payments under development agreements for research and development services, upfront license payments, and from upfront customer payments received under product supply agreements. Contract liabilities are classified as a liability on the consolidated balance sheets.

During the years ended December 31, 2024, 2023 and 2022, we had no asset impairment charges related to contract assets.

We recognized the following revenues (in thousands):

	Year Ended December 31,	
Revenue recognized in the period for:	**2024**	**2023**
Amounts included in contract liabilities at the beginning of the period:		
Performance obligations satisfied	$ 10,121	$ 17,937
Changes in the period:		
Changes in the estimated transaction price allocated to performance obligations satisfied in prior periods	314	4,165
Performance obligations satisfied from new activities in the period - contract revenue	48,910	48,041
Total revenues	$ 59,345	$ 70,143

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 December 31, 2024.

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 (in thousands):

	2025	**2026**	**2027**	**2028 and Thereafter**	**Total**
Product revenue	$ 350	$ 100	$ —	$ —	$ 450

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, diluted and basic net loss per share 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):

	Year Ended December 31,		
	2024	**2023**	**2022**
Shares issuable under the Equity Incentive Plans and ESPP[1]	13,613	9,028	7,442
Warrants[2]	424	—	—
Total potentially dilutive securities	14,037	9,028	7,442

[1] Included 665,160 and 568,224 of anti-dilutive potential common shares from ESPP for the years ended December 31, 2024 and 2023, respectively.
[2] Pertains to the warrants issued in connection with the Innovatus Loan. For additional information, see Note 14, "Debt."

Note 5. Collaborative Arrangements

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 options under the terms of the Sitagliptin Supply Agreement to extend the agreement for an additional five years through February 2022. In September 2021, the Sitagliptin 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 $7.1 million, $4.4 million and $5.9 million in product revenue under this agreement in the years ended December 31, 2024, 2023 and 2022, respectively. This represented 12%, 6%, and 4% of our total revenues in the years ended December 31, 2024, 2023 and 2022, respectively.

During the year ended December 31, 2024, we recorded revenue of $2.5 million from sitagliptin enzyme sales 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 2024.

Enzyme Supply Agreement and Commercial Agreement

In November 2016, we entered into an enzyme supply agreement with a customer, receiving an upfront payment recorded as deferred revenue which was recognized as the customer purchased our enzyme. In April 2019, we entered into a multi-year commercial agreement with the same customer for the exclusive use of our enzymes in some of their products, with royalties to be earned. Both the enzyme supply agreement and commercial agreement were terminated in 2023. Due to the early termination of the enzyme supply agreement in 2023, we recognized $3.2 million of product revenue from the release of prior periods' product revenue deferrals and also recognized an additional $1.3 million of product revenue as settlement fee.

Strategic Collaboration Agreement

In October 2017, we entered into the Nestlé Strategic Collaboration Agreement (the "Nestlé SCA") with Nestlé, pursuant to which we and Nestlé collaborated to leverage the CodeEvolver technology platform to develop novel enzymes for Nestlé's established Consumer Care and Medical Nutrition business areas.

In January 2020, we entered into a development agreement with Nestlé pursuant to which we and Nestlé collaborated to advance a lead candidate discovered through our Nestlé SCA, CDX-7108, targeting exocrine pancreatic insufficiency, into preclinical and early clinical studies. We, together with Nestlé Health Science, initiated a Phase 1 clinical trial of CDX-7108 in the fourth quarter of 2021, and on February 23, 2023, we and Nestlé announced interim results. In July 2023, we announced plans to discontinue our development support of CDX-7108. Both the Nestlé SCA and development agreement were terminated in January 2024 under the terms of the CDX-7108 Acquisition Agreement with Nestlé.

Under the Nestlé SCA and the development agreement, we recognized nil, $4.1 million and $7.1 million in research and development revenue in the years ended December 31, 2024, 2023 and 2022, respectively.

Acquisition Agreement

In December 2023, we entered into an acquisition agreement (the "Acquisition Agreement") with Nestlé, pursuant to which we agreed to assign our interests in CDX-7108 (including associated agreements and intellectual property rights) to Nestlé. Under the terms of the Acquisition Agreement, Nestlé will be solely responsible for the continued development and commercialization of CDX-7108, including all associated costs, and Codexis will receive upfront payment, future potential milestone payments and net-sales based royalties. We recognized $5.0 million in research and development revenue for the year ended December 31, 2023 related to the Acquisition Agreement, with the $5.0 million upfront fee received in January 2024.

Platform Technology Transfer and License Agreement

In May 2019, we entered into the Novartis CodeEvolver Agreement with Novartis. The Novartis CodeEvolver Agreement allows Novartis to use our proprietary CodeEvolver technology platform 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 technology platform to Novartis (the "Technology Transfer Period"). As a part of this technology transfer, we 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 technology platform 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 (the "Improvements Term"), Novartis will pay Codexis annual payments over four years which amount to an additional $8.0 million in aggregate. We received an aggregate of $6.0 million for the first three annual payments in 2022 to 2024. 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 technology platform during the period beginning on the conclusion of the Technology Transfer Period and ending on the expiration date of the last to expire licensed patent. Revenue for the combined initial license and technology transfer performance obligation was recognized overtime based on hours incurred. Revenue allocated to improvements made during the Improvements Term is being recognized during the Improvements Term.

We recognized $1.0 million, $1.1 million and $1.0 million in research and development revenue in the years ended December 31, 2024, 2023 and 2022, respectively.

License Agreement

In December 2019, we entered a license agreement with Roche to provide Roche with our evolved T4 DNA ligase high-performance molecular diagnostic enzyme. The royalty bearing license grants Roche worldwide rights to include the evolved T4 DNA ligase in its nucleic acid sequencing products and workflows. Under the license agreement, we received an initial collaboration fee payment of $0.8 million within 45 days of the effective date of the agreement, and we received an additional $0.9 million milestone payment after the completion of technology transfer in October 2020. In February 2024, we entered into a new license agreement with Roche granting them rights to our newly engineered DNA ligase, superseding our prior 2019 agreement. Under the terms of the deal, we received upfront and technical milestones payments. We recognized research and development fees of $6.0 million in the year ended December 31, 2024 related to the license agreement.

Strategic Collaboration and License Agreement

In March 2020, we entered into a Strategic Collaboration and License Agreement (the "Takeda Agreement") with Shire Human Genetic Therapies, Inc., a wholly-owned subsidiary of Takeda Pharmaceutical Co. Ltd. ("Takeda"), pursuant to which we have collaborated with Takeda 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. We completed the research and development services relating to the fourth program with Takeda during the second quarter of 2023.

Pursuant to the Takeda Agreement, we were eligible to receive other payments that included (i) clinical development and commercialization-based milestones, per target gene, of up to $104.0 million and (ii) tiered royalty payments based on net sales of applicable products at percentages ranging from the mid-single digits to low single-digits. Takeda announced in April 2023 the discontinuation of these development programs, and in 2024 we divested our rights in some of the underlying assets to Crosswalk Therapeutics.

Revenue 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 $0.8 million, $2.0 million and $4.9 million in the years ended December 31, 2024, 2023, and 2022, respectively. As of December 31, 2024 and 2023, we had deferred revenue balances of nil.

Master Collaboration and Research Agreement, Stock Purchase Agreement and Enzyme Supply Agreement

In June 2020, we entered into a Stock Purchase Agreement with MAI in which we purchased 1,587,050 shares of MAI's Series A preferred stock for $1.0 million.

Concurrently with our initial equity investment, we entered into the MAI Agreement, pursuant to which we performed services utilizing our CodeEvolver technology platform to improve DNA polymerase enzymes in exchange for compensation in the form of additional shares of MAI's Series A and B preferred stock which are valued based on the observed transaction price of similar securities of MAI issued to third parties. Under the MAI Agreement, we will have the right to use and sell the engineered enzymes to third parties for any purpose other than for the synthesis of native DNA. Under the MAI Agreement, we would make a $0.5 million payment to MAI upon our achievement of a milestone of $5.0 million in aggregate commercial sales to third parties of the engineered enzymes or any product incorporating or derived from the engineered enzymes for any purpose other than the synthesis of native DNA. As contemplated in the MAI Agreement, we executed the Commercial License and Enzyme Supply Agreement with MAI ("MAI Supply Agreement") in July 2022 following the completion of certain timelines specified in the SOW.

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 MAI Series B preferred stock. Upon execution of the MAI Supply Agreement in July 2022, we received the commercialization and enzyme supply agreement milestone payment pursuant to the MAI Agreement of $1.0 million in the form of an additional 1,587,049 shares of MAI Series B preferred stock. Pursuant to the MAI Agreement, we recognized nil , nil, and $1.2 million in research and development revenue from transactions with MAI in the years ended December 31, 2024, 2023, and 2022, respectively. Payment for the services rendered was received in the form of additional MAI Series A and Series B preferred stock. We received an aggregate of nil, nil, and 1,587,049 shares of MAI's Series A and B preferred stock in the years ended December 31, 2024, 2023, and 2022, respectively.

In April 2022, we received a purchase order from MAI for the delivery of certain enzyme products to MAI in 2022. In July 2022, we and MAI executed the MAI Supply Agreement that will enable MAI to utilize an evolved terminal deoxynucleotidyl transferase enzyme in MAI's Fully Enzymatic Synthesis technology. Pursuant to the MAI Supply Agreement, we recognized $0.1 million of minimum royalty as part of the research and development revenue in the year ended December 31, 2024. In January 2025, MAI assigned the MAI Supply Agreement to a third party in connection with the sale of its related assets to such third party. We recognized $0.2 million, $0.2 million, and $0.5 million in product revenue in the years ended December 31, 2024, 2023, and 2022, respectively.

MAI was considered a related party until August 2022, when the related party relationship ended following the retirement of our former President and CEO, who also served on MAI's board of directors.

Pfizer Enzyme Supply Agreement

During 2021 and 2022, we 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.

We are a party to an Enzyme Supply Agreement with Pfizer Ireland Pharmaceuticals, a subsidiary of Pfizer, Inc. (the "Pfizer Supply Agreement"), covering the manufacture, sale and purchase of CDX-616 for use by Pfizer in the manufacture of nirmatrelvir. Under the terms of the Pfizer Supply Agreement, Pfizer paid us a fee of $25.9 million in August 2022 which was recorded as deferred revenue. Pursuant to the agreement, 90% of the fee ($23.3 million) is creditable against (i) future orders of CDX-616 used to manufacture its PAXLOVID with shipment dates prior to December 31, 2023, and (ii) fees associated with any new development and licensing agreements with Pfizer entered into prior to April 4, 2023. On March 31, 2023, we entered into a license agreement whereby Pfizer utilized a portion of the $23.3 million credit towards a license to develop future product candidates, for which we recognized $5.0 million as non-cash research and development revenue in the second quarter of 2023. Pfizer's ability to utilize the credit under item (i) above expired on December 31, 2023, and under item (ii) above expired on April 4, 2023. We also recognized $2.0 million of non-cash research and development revenue, and credited against the $25.9 million fee, for other services provided to Pfizer during the year ended December 31, 2023. Up to 50% of any portion of the $25.9 million which has not been credited under items (i) and (ii) was creditable against future orders of CDX-616 used to manufacture PAXLOVID with shipment dates in 2024.

On December 20, 2024, we entered into a license agreement whereby Pfizer utilized the remaining credit toward the upfront fee under the license agreement, pursuant to the terms of the same-day amendment to the Pfizer Supply Agreement that allowed the product credit to be utilized for this license. We recognized $9.5 million of non-cash research and development revenue in the year ended December 31, 2024 related to the license agreement, and no further credit remains available for Pfizer.

During the fourth quarter of 2023, and pursuant to the Pfizer Supply Agreement, we released the prior year deferrals for the unused portion of the retainer fee that is not creditable beyond 2023 and we recognized product revenue of $8.2 million in the year ended December 31, 2023. We recognized product revenue of $75.4 million in the year ended December 31, 2022, from the sale of quantities of CDX-616 to Pfizer. Product revenues recognized by us from the Pfizer Supply Agreement represented 0%, 12%, and 54% of our total revenues for the years ended December 31, 2024, 2023, and 2022, respectively.

As of December 31, 2024 and 2023, we had nil and $9.5 million, respectively, in deferred revenue related to the $25.9 million fee received from Pfizer.

Note 6. Investments in Non-Marketable Securities

Non-Marketable Equity Securities

Our non-marketable equity securities are investments in privately held companies without readily determinable market value and primarily relate to our investments in MAI 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 when 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. The fair value of non-marketable equity securities are classified within Level 3 when we estimate fair value using unobservable inputs such as when we remeasure due to impairment and we use discount rates, market data of comparable companies, and rights and obligations of the securities the Company holds, among others. 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 interest and other expense, net in the consolidated statements of operations.

In November 2023, the 207,070 shares of Arzeda’s Series B preferred stock were converted into 41,414 common stock pursuant to the Stock Purchase Agreement.

In March 2023, we purchased an additional 985,545 shares of Series B preferred stock for $0.8 million in MAI, a privately held life sciences company. As of December 31, 2024, we held an aggregate of 19,277,914 shares of MAI's Series A and B preferred stock that we have earned or purchased from MAI.

In March 2022, we entered into a Stock Purchase Agreement with seqWell, a privately held life sciences company, pursuant to which we purchased 1,000,000 shares of seqWell's Series C preferred stock for $5.0 million. In March 2023, we entered into a Master Collaboration Agreement and Research Agreement with seqWell (the “seqWell Agreement”), pursuant to which we provided research and experimental screening and protein engineering activities in exchange for compensation in the form of additional shares of seqWell's common stock. In January 2025, we sold assets that were developed under the seqWell Agreement to seqWell in exchange for the right to receive a cash payment upon future events and a warrant to purchase seqWell’s common stock exercisable upon future events, and terminated the seqWell Agreement. In addition to our initial equity investment and the shares we have received under the seqWell Agreement, in September 2023, we purchased an additional 88,256 shares of seqWell's Series C-1 preferred stock and 44,128 common stock warrants for $0.4 million. We received 205,279 shares of seqWell's common stock from research and development services with seqWell and we recognized $0.2 million in research and development revenue from these services in the year ended December 31, 2023. As of December 31, 2024, we held an aggregate of 1,088,256 shares of Series C and C-1 preferred stock, 205,279 shares of common stock and 44,128 of common stock warrants that we have earned or purchased from seqWell.

For the year ended December 31, 2024, we recognized an impairment charge of $6.9 million which is presented within interest and other expense, net in the consolidated statements of operations. This adjustment included the write-down of our investment in MAI by $3.9 million during the third quarter of 2024 to its related fair value as determined based on valuation methods using the latest observed transaction price of MAI’s preferred stock securities anticipated to be issued during the fourth quarter of 2024 and adjusted for the rights and obligations of the preferred stock securities the Company holds, and an additional $2.8 million impairment charge during the fourth quarter of 2024 to adjust the carrying value of our investment to zero as the investee ceased its operations during the fourth quarter of 2024 due to liquidity position and lack of access to additional capital. The other $0.2 million of impairment charge on our investment in seqWell is related to the write-down to its estimated fair value using the recent transaction price of similar preferred stock securities issued by the investee and adjusted for the rights and obligations of the preferred stock securities the Company holds.

For the year ended December 31, 2023, we recognized an impairment charge of $12.2 million and included this as adjustment to the carrying value of our investments in seqWell, Arzeda and MAI. This adjustment, which is presented within other income (expense), net in the consolidated statements of operations, included the write-down of the carrying value of our investment in seqWell by $3.0 million during the third quarter of 2023 to its estimated fair value as determined based on valuation methods using the recent transaction price of similar preferred stock securities issued by seqWell and adjusted for the rights and obligations of the preferred stock securities the Company holds. The $1.2 million of impairment charge on our investment in Arzeda is related to the write-down to its estimated fair value based on the latest observed transaction price of Arzeda's preferred stock securities issued during the fourth quarter of 2023 and the subsequent conversion of our existing Series B preferred stock into Arzeda's common stock during the fourth quarter of 2023. The other $8.0 million of impairment charge represents the difference between the estimated fair value and carrying value of our investment in MAI as of December 31, 2023 based on quantitative and qualitative analysis. This analysis involved use of judgment, estimates and assumptions, such as the near-term prospects of the investee in the market in which it operates, evaluation of the investee's financial condition in relation to its outstanding obligations, and probabilities of securing additional capital through various alternative scenarios.

For the year ended December 31, 2022, we recognized a $0.2 million unrealized gain in interest and other expense, net, and included as adjustment to the carrying value of our investment in MAI, for the remeasurement of the additional 1,587,049 shares of Series B preferred stock received as a milestone payment during the third quarter of 2022 based on the latest observed transaction price of MAI's preferred stock.

Other than as disclosed above, there were no remeasurement events for our investments in non-marketable equity securities in 2024 and 2023. We recognized no realized gains or losses during the years ended December 31, 2024 and 2023.

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

	December 31, 2024	December 31, 2023
seqWell	$ 2,416	$ 2,625
MAI	—	6,693
Other investments in non-marketable equity securities	382	382
Total non-marketable equity securities	$ 2,798	$ 9,700

Note 7. Fair Value Measurements

The following tables show the Company's cash, cash equivalents, and short-term investments by significant investment category (in thousands):

	December 31, 2024					
	Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value	Cash and Cash Equivalents	Short-term Investments
Cash	$ 3,284	$ —	$ —	$ 3,284	$ 3,284	$ —
Level 1:						
Money market funds	15,980	—	—	15,980	15,980	—
Level 2[1]:						
Commercial paper	6,768	1	—	6,769	—	6,769
Corporate debt	17,187	8	(15)	17,180	—	17,180
U.S. agency securities	1,989	2	—	1,991	—	1,991
U.S. treasury securities	28,198	56	—	28,254	—	28,254
Subtotal	54,142	67	(15)	54,194	—	54,194
Total	$ 73,406	$ 67	$ (15)	$ 73,458	$ 19,264	$ 54,194

[1] The valuation techniques used to measure the fair values of the Company's Level 2 financial instruments uses inputs that are either directly or indirectly observable for the asset through correlation with market data at the measurement date and for the duration of the instrument's anticipated life.

	December 31, 2023					
	Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value	Cash and Cash Equivalents	Short-term Investments
Cash	$ 8,742	$ —	$ —	$ 8,742	$ 8,742	$ —
Level 1:						
Money market funds	56,374	—	—	56,374	56,374	—
Total	$ 65,116	$ —	$ —	$ 65,116	$ 65,116	$ —

We limit the credit risk associated with our cash equivalents and short-term investments by placing them with banks and institutions we believe are highly credit-worthy and investing in highly-rated investments. As of December 31, 2024, the contractual maturity of all investments held was less than one year.

During the years ended December 31, 2024 and 2023, we did not recognize any significant credit losses nor other-than-temporary impairment losses on non-marketable securities.

Note 8. Balance Sheet Details

Inventories

Inventories consisted of the following (in thousands):

	December 31,	
	2024	2023
Raw materials	$ —	$ 108
Work in process	29	7
Finished goods	1,770	2,570
Total inventories	$ 1,799	$ 2,685

Prepaid expenses and other current assets

As of December 31, 2024, prepaid expenses and other current assets consists of prepaid expenses of $3.7 million and other current assets of $0.5 million. As of December 31, 2023, prepaid expenses and other current assets consists of prepaid expenses of $4.6 million and other current assets of $0.6 million.

Property and Equipment, net

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

	December 31,	
	2024	2023
Laboratory equipment[1]	$ 35,949	$ 37,216
Leasehold improvements	12,159	11,912
Computer equipment	2,459	2,565
Office furniture and equipment	1,124	1,469
Construction in progress[2]	3,441	1,636
Property and Equipment	55,132	54,798
Less: accumulated depreciation	(40,935)	(39,311)
Property and equipment, net	$ 14,197	$ 15,487

[1] Fully depreciated property and equipment with a cost of $2.6 million and $3.0 million were retired during the years ended December 31, 2024 and 2023, respectively.
[2] Construction in progress includes equipment received but not yet placed into service pending installation.

In July 2023, we announced our plan to consolidate operations from our San Carlos facility to our headquarters in Redwood City. As part of this plan, we entered into agreements to sell certain laboratory equipment located in our San Carlos facility through an asset auction and as part of the lease assignment of the San Carlos facility to Vaxcyte (see further discussion at Note 13, "Commitments and Contingencies"). These certain items of laboratory equipment met the assets held for sale criteria and were sold during the fourth quarter of 2023. Using a fair value estimate based on Level 3 inputs in the fair value hierarchy, the Company determined that the carrying value of these assets exceeded fair value less costs to sell, which resulted in a write-down of $1.5 million, presented within the asset impairment and other charges line item in the consolidated statements of operations in the year ended December 31, 2023.

During the year ended December 31, 2023, the Company recorded a non-cash impairment charge of $4.7 million associated with the San Carlos facility leasehold improvements. For additional information, see Note 13, "Commitments and Contingencies."

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

	Year Ended December 31,		
	2024	2023	2022
Research and development	$ 3,964	$ 4,594	$ 4,556
Selling, general and administrative	881	924	846
Total depreciation expense	$ 4,845	$ 5,518	$ 5,402

Goodwill

	December 31,	
	2024	2023
Goodwill at beginning of period	$ 2,463	$ 3,241
Impairment	—	(778)
Goodwill at end of period	$ 2,463	$ 2,463

Goodwill was previously allocated to each of the Company's reporting units. In July 2023, we announced a restructuring of our business and that we are discontinuing investment in certain development programs, primarily in Novel Biotherapeutics. As a result of this plan, the Company determined that a triggering event had occurred that required an interim goodwill impairment test during the third quarter of 2023. The fair value estimate used in the interim goodwill impairment test was primarily based on Level 3 inputs in the fair value hierarchy. Based on the results of the impairment evaluation, the Company determined that the goodwill within the Novel Biotherapeutics reporting unit was impaired, which resulted in a non-cash impairment charge of $0.8 million to write off all of the associated goodwill. The impairment charge is recorded within the asset impairment and other charges in the consolidated statements of operation in the year ended December 31, 2023. Goodwill had a carrying value of $2.5 million as of December 31, 2024 and 2023, respectively.

Other Accrued Liabilities

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

	December 31,	
	2024	2023
Accrued professional and outside service fees	$ 3,064	$ 2,330
Accrued purchases	2,908	1,402
Other	251	1,003
Total other accrued liabilities	$ 6,223	$ 4,735

Note 9. Stock-based Compensation

Equity Incentive Plans

In August 2024, our Board of Directors (the "Board") approved the 2024 Employment Inducement Award Plan (the "2024 Inducement Plan") which provides for the grant of non-qualified stock options, RSAs, restricted stock units ("RSUs"), and performance awards to eligible employees with respect to an aggregate of up to 1,000,000 shares of our common stock.

In January 2023, our Board approved the 2022 Employment Inducement Award Plan (the "2022 Inducement Plan") which provides for the grant of non-qualified stock options, RSAs, RSUs, performance awards, other stock awards and dividend equivalents to eligible employees with respect to an aggregate of up to 2,000,000 shares of our common stock. In June 2023, the 2022 Inducement Plan was terminated upon the approval of an amendment to the Company's 2019 Incentive Award Plan (the "2019 Plan") at the Annual Meeting of Stockholders in June 2023 (the "2023 Annual Meeting").

In 2019, the Board and stockholders approved 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 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. The 2019 Plan provides for the grant of stock options, including incentive stock options and non-qualified stock options, stock appreciation rights, RSAs, RSUs, PSUs, 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 that were initially 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. In June 2019, 8.1 million shares authorized for issuance under the 2019 Plan were registered under the Securities Act. In April 2023, the Board approved an amendment to the 2019 Plan (the "2019 Amended Plan") which became effective upon stockholders' approval at the 2023 Annual Meeting. The 2019 Amended Plan included the (i) increase in the number of shares available by 8,000,000 shares, such that an aggregate of 15,897,144 shares are reserved for issuance under the 2019 Amended Plan and any shares subject to awards granted under the 2010 Plan, and (ii) increase in the number of shares that may be granted as incentive stock options under the 2019 Amended Plan such that an aggregate of 22,000,000 shares of common stock may be granted as incentive stock options under the 2019 Amended Plan.

As of December 31, 2024, total shares remaining available for issuance under the 2019 Plan and 2024 Inducement Plan were 3,937,070 shares.

Employee Stock Purchase Plan

In April 2023, the Board approved an employee stock purchase plan (as may be amended from time to time, the "ESPP") which became effective upon approval at the 2023 Annual Meeting. The ESPP allows eligible employees of the Company to purchase shares of our common stock through payroll deductions. Offering periods are generally over a 24-month period and begin in May and November of each year. The per share purchase price will be the lower of 85% of the closing trading price per share of our common stock on the first trading date of an offering period in which a participant is enrolled or 85% of the closing trading price per share on the purchase date. Participant purchases are limited to a maximum of $25,000 of fair value of our stock per calendar year. The Company is authorized to grant up to 2,000,000 shares of common stock under the ESPP. The first offering period of the ESPP commenced in December 2023.

For the year ended December 31, 2024, 263,157 shares of our common stock were purchased under the ESPP. As of December 31, 2024, 1,736,843 shares of common stock were available for future issuance under the ESPP. We recognized $0.3 million of stock-based compensation expenses related to the ESPP for the year ended December 31, 2024. As of December 31, 2024, the total unrecognized stock-based compensation expense, net of expected forfeitures, related to the ESPP was $0.6 million and is expected to be recognized over the remaining offering period.

Stock Options

Stock options granted to employees generally have a maximum term of ten 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. In January 2024, the Board approved the grants of stock options with a vesting term over three years from the date of grant, of which 33% vest at the end of one year, and 67% vest monthly over the remaining two years.

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")

In prior years, the compensation committee of the Board approved grants of PBOs and PSUs to our executives, and solely in respect of non-executive employees, delegated to our CEO the authority to approve grants of PSUs. 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, as determined by the compensation committee of the Board, 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.

No PSUs and PBOs were granted in 2024 and 2023. In 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 finance and corporate strategy, performance enzymes and biotherapeutics deliverables, research plans, and organizational development. In the first quarter of 2023, the compensation committee of the Board determined that the 2022 PSUs and 2022 PBOs performance goals had been achieved at 85.0% and 42.5% of the target level, respectively, and recognized stock-based compensation expenses accordingly. Accordingly, 50% of the shares underlying the 2022 PSUs and PBOs vested in the first quarter of 2023 and 50% of the shares underlying the 2022 PSUs and PBOs vested in the first quarter of 2024, 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 consolidated statements of operations as follows (in thousands):

	Year Ended December 31,		
	2024	**2023**	**2022**
Costs of product revenue	$ 429	$ 354	$ 452
Research and development	2,928	2,631	3,907
Selling, general and administrative	9,730	6,986	10,172
Total	$ 13,087	$ 9,971	$ 14,531

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

	Year Ended December 31,		
	2024	2023	2022
Stock options	$ 6,423	$ 3,962	$ 4,167
RSUs and RSAs	4,717	4,447	4,807
PSUs	247	1,649	3,268
PBOs	1,357	$ (112)	2,289
ESPP	343	25	—
Total	$ 13,087	$ 9,971	$ 14,531

During the fourth quarter of 2024, we entered into Separation and Consulting Agreements with Sri Ryali, our former Chief Financial Officer, and two other former executives. Under these agreements, the outstanding unvested options and awards for each of the three former executives will continue to vest through the end of their consultancy period, which concludes on February 28, 2025. This modification resulted in a reduction of stock-based compensation expense of $0.4 million recognized in selling, general and administrative expenses during the year ended December 31, 2024.

On June 29, 2024, we entered into an Advisory Services Agreement with a former executive of the Company. Pursuant to the advisory agreement, the exercise period for the former executive's vested stock options and performance-based options was also extended. This modification resulted in a stock-based compensation expense of $2.0 million recognized in selling, general and administrative expenses during the year ended December 31, 2024.

In connection with the retirement of John Nicols, our former President and Chief Executive Officer, in August 2022, and the Transition and Separation Agreement between Mr. Nicols and the Company, certain supplementary modifications were made to Mr. Nicols' vested and unvested stock option and PBOs awards including voluntary forfeiture of certain unvested stock option and PBOs awards and the extension of the post-termination exercise period of certain vested stock option and PBOs awards. During the year ended December 31, 2022, we recorded a one-time, non-cash incremental compensation expense of $1.0 million, net of the required reversal of previously recognized stock-based compensation expenses attributed to unvested shares, in selling, general and administrative expenses related to these stock option award modifications.

Grant Award Activities:

Stock Option Awards

We estimated the fair value of stock options using the Black-Scholes-Merton option-pricing model based on the date of grant. The following summarizes the weighted-average assumptions used to estimate the fair value of employee stock options granted:

	Year Ended December 31,		
	2024	2023	2022
Expected life (years)	5.9	5.8	5.7
Volatility	73.3 %	66.2 %	62.1 %
Risk-free interest rate	3.9 %	4.0 %	3.1 %
Expected dividend yield	0.0 %	0.0 %	0.0 %

The following summarizes the weighted-average assumptions used to estimate the fair value of 20,000 and 50,000 shares of stock options granted to non-employees for services valued at $44 thousand and $0.1 million during the years ended December 31, 2024 and 2023, respectively:

	Year Ended December 31,	
	2024	2023
Expected life (years)	5.8	5.8
Volatility	74.7 %	70.1 %
Risk-free interest rate	4.4 %	4.7 %
Expected dividend yield	0.0 %	0.0 %

The weighted average grant date fair value per share of non-employee stock options granted respectively in 2024 and 2023 was $2.19 and $1.05, respectively.

The following tables summarizes stock option activities:

	Number of Shares	Weighted Average Exercise Price Per Share
	(In Thousands)	
Outstanding at December 31, 2021	2,935	$ 8.90
Granted	2,000	$ 8.90
Exercised	(410)	$ 2.33
Forfeited/Expired	(275)	$ 19.01
Outstanding at December 31, 2022	4,250	$ 8.88
Granted	2,046	$ 5.23
Exercised	(283)	$ 1.97
Forfeited/Expired	(839)	$ 12.08
Outstanding at December 31, 2023	5,174	$ 7.31
Granted	4,837	$ 3.08
Exercised	(399)	$ 3.24
Forfeited/Expired	(484)	$ 8.75
Outstanding at December 31, 2024	9,128	$ 5.17

	Number of Shares	Weighted Average Exercise Price Per Share	Weighted Average Remaining Contractual Term	Aggregate Intrinsic Value
	(In Thousands)		(In Years)	(In Thousands)
Outstanding at December 31, 2024	9,128	$ 5.17	6.3	$ 8,497
Exercisable at December 31, 2024	2,840	$ 8.05	4.5	$ 402
Vested and expected to vest at December 31, 2024	8,508	$ 5.27	6.2	$ 7,724

The weighted average grant date fair value per share of employee stock options granted in 2024, 2023, and 2022 were $2.05, $3.31 and $4.99, respectively. The total intrinsic value of options exercised in 2024, 2023, and 2022 were $0.6 million, $0.7 million and $3.1 million, respectively.

As of December 31, 2024, there was $11.3 million of unrecognized stock-based compensation, net of expected forfeitures, related to unvested stock options, which we expect to recognize over a weighted average period of 2.3 years.

Restricted Stock Awards ("RSAs")

The following table summarizes RSA activities:

	Number of Shares	Weighted Average Grant Date Fair Value Per Share
	(In Thousands)	
Non-vested balance at December 31, 2021	80	$ 17.53
Granted	159	$ 7.53
Vested	(58)	$ 18.42
Non-vested balance at December 31, 2022	181	$ 8.45
Granted	277	$ 2.89
Vested	(133)	$ 9.04
Non-vested balance at December 31, 2023	325	$ 3.48
Granted	211	$ 3.32
Vested	(302)	$ 3.31
Non-vested balance at December 31, 2024	234	$ 3.56

The total fair value, as of the vesting date, of RSAs vested in fiscal years 2024, 2023 and 2022 were $1.0 million, $0.4 million and $0.5 million respectively.

As of December 31, 2024, there was $0.4 million of unrecognized stock-based compensation cost related to non-vested RSAs, which we expect to recognize over a weighted average period of 0.5 years.

Restricted Stock Units ("RSUs")

The following table summarizes RSU activities:

	Number of Shares	Weighted Average Grant Date Fair Value Per Share
	(In Thousands)	
Non-vested balance at December 31, 2021	232	$ 21.83
Granted	518	$ 17.46
Vested	(106)	$ 21.21
Forfeited/Expired	(126)	$ 19.55
Non-vested balance at December 31, 2022	518	$ 18.15
Granted	1,049	$ 5.24
Vested	(204)	$ 18.42
Forfeited/Expired	(343)	$ 9.71
Non-vested balance at December 31, 2023	1,020	$ 7.66
Granted	1,530	$ 3.08
Vested	(383)	$ 8.96
Forfeited/Expired	(157)	$ 4.66
Non-vested balance at December 31, 2024	2,010	$ 4.16

The total fair value, as of the vesting date, of RSUs vested in fiscal years 2024, 2023 and 2022 were $1.1 million, $1.1 million and $1.8 million respectively.

As of December 31, 2024, there was $4.2 million of unrecognized stock-based compensation cost related to non-vested RSUs, which we expect to recognize over a weighted average period of 1.8 years.

Performance-Contingent Restricted Stock Units ("PSUs")

The following table summarizes PSU activities:

	Number of Shares	Weighted Average Grant Date Fair Value Per Share
	(In Thousands)	
Non-vested balance at December 31, 2021	128	$ 21.24
Granted	686	$ 9.55
Vested	(107)	$ 20.52
Forfeited/Expired	(40)	$ 19.93
Non-vested balance at December 31, 2022	667	$ 9.41
Vested	(315)	$ 11.02
Forfeited/Expired	(75)	$ 12.49
Other	15	$ 25.05
Non-vested balance at December 31, 2023	292	$ 7.69
Vested	(248)	$ 7.69
Forfeited/Expired	(44)	$ 7.69
Non-vested balance at December 31, 2024	—	$ —

The total fair value, as of the vesting date, of PSUs vested in the years ended December 31, 2024, 2023, and 2022 were $0.9 million, $1.6 million, and $2.1 million, respectively.

As of December 31, 2024, there was nil of unrecognized stock-based compensation cost related to non-vested PSUs.

Performance Based Options ("PBOs")

We estimated the fair value of PBOs using the Black-Scholes-Merton option-pricing model based on the date of grant. No PBOs were granted to employees for their services during the year ended December 31, 2024. The following summarize the weighted-average assumptions used to estimate the fair value of PBOs granted:

	Year Ended December 31,
	2022
Expected life (years)	5.6
Volatility	54.9 %
Risk-free interest rate	1.8 %
Expected dividend yield	0.0 %

The following tables summarizes PBOs activities:

	Number of Shares	Weighted Average Grant Date Fair Value Per Share
	(In Thousands)	
Outstanding at December 31, 2021	1,840	$ 4.11
Granted	733	$ 9.89
Forfeited/Expired	(747)	$ 8.29
Outstanding at December 31, 2022	1,826	$ 4.70
Forfeited/Expired	(178)	$ 9.73
Outstanding at December 31, 2023	1,648	$ 5.64
Forfeited/Expired	(73)	$ 10.23
Outstanding at December 31, 2024	1,575	$ 5.43

	Number of Shares	Weighted Average Exercise Price Per Share	Weighted Average Remaining Contractual Term	Aggregate Intrinsic Value
	(In Thousands)		(In Years)	(In Thousands)
Exercisable at December 31, 2024	1,575	$ 10.62	3.4	$ 114
Vested and expected to vest at December 31, 2024	1,575	$ 10.62	3.4	$ 114

The total fair value of exercised PBOs for 2024, 2023 and 2022, was nil.

As of December 31, 2024, there was nil of unrecognized stock-based compensation cost related to non-vested PBOs.

Employee Stock Purchase Plan ("ESPP")

The fair value of shares to be issued under the ESPP is computed using the Black-Scholes-Merton option pricing model at the commencement of the offering period. The following summarizes the weighted-average assumptions used to estimate the fair value of ESPP for the initial offering period:

	Year Ended December 31,	
	2024	2023
Expected life (years)	1.2	0.4
Volatility	89.4 %	89.6 %
Risk-free interest rate	4.6 %	5.3 %
Expected dividend yield	0.0 %	0.0 %

Note 10. Capital Stock

Sales Agreements

In May 2021, we filed a Registration Statement on Form S-3 with the SEC (the "2021 Registration Statement"), that automatically became effective upon its filing, under which we were permitted to sell common stock, preferred stock, debt securities, warrants, purchase contracts, and units from time to time in one or more offerings. On February 27, 2023, we filed a post-effective amendment to the 2021 Registration Statement. Pursuant to that post-effective amendment, we registered an aggregate $200.0 million of securities. 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 determined from time to time, may have sold 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 was permitted to 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.

We were not required to sell any shares at any time during the term of the EDA. On April 24, 2024, we terminated the EDA.

No shares of our common stock were issued and sold pursuant to the EDA during the year ended December 31, 2024. During the year ended December 31, 2023, 3,079,421 shares of our common stock were issued and sold pursuant to the EDA. During the year ended December 31, 2023, we received gross proceeds of $8.7 million or $7.9 million in net proceeds after PSC's commissions and direct offering expenses of $0.7 million.

On May 2, 2024, we entered into a Controlled Equity Offering℠ Sales Agreement (the "Cantor Sales Agreement") with Cantor Fitzgerald & Co., as sales agent ("Cantor"), under which Cantor, at our discretion and at such times that we may determine from time to time, may sell up to a maximum of $75.0 million of shares of our common stock. Under the terms of the Cantor Sales Agreement, Cantor 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. On May 2, 2024, we filed a registration statement on Form S-3 registering the offer and sale of these shares under the Securities Act which became effective on May 14, 2024. We will pay a commission of up to 3.0% of gross sales proceeds of any common stock sold under the Cantor Sales Agreement.

During the year ended December 31, 2024, 10,440,000 shares of our common stock were issued and sold pursuant to the Cantor Sales Agreement. During the year ended December 31, 2024, we received gross proceeds of $31.3 million or $29.7 million in net proceeds after Cantor's commissions and direct offering expenses of $1.6 million. As of December 31, 2024, $43.7 million remained available for sale under the Cantor Sales Agreement.

Note 11. 401(k) Plan

In January 2005, we implemented a 401(k) Plan covering certain employees. Currently, all of our United States based employees over the age of 18 are eligible to participate in the 401(k) Plan. Under the 401(k) Plan, eligible employees may elect to reduce their current compensation up to a certain annual limit and contribute these amounts to the 401(k) Plan. We may make matching or other contributions to the 401(k) Plan on behalf of eligible employees. We recorded employer matching contributions expense of $1.2 million, $1.4 million, and $1.6 million in the years ended December 31, 2024, 2023, and 2022, respectively.

Note 12. Income Taxes

Our loss before provision for income taxes were as follows (in thousands):

	Year Ended December 31,		
	2024	2023	2022
United States	$ (65,231)	$ (76,169)	$ (33,269)
Foreign	(11)	(2)	(47)
Loss before provision for income taxes	$ (65,242)	$ (76,171)	$ (33,316)

The tax provision for the year ended December 31, 2024 and 2023 consists primarily of current year state and foreign income taxes. The tax provision for the year ended December 31, 2022 consists primarily of taxes attributable to foreign operations. The components of the provision for income taxes are as follows (in thousands):

	Year Ended December 31,		
	2024	2023	2022
Current provision:			
State	$ (6)	$ 27	$ 141
Foreign	42	42	142
Total current provision	36	69	283
Deferred benefit:			
Foreign	(2)	—	(7)
Total deferred benefit	(2)	—	(7)
Provision for income taxes	$ 34	$ 69	$ 276

Reconciliation of the provision for income taxes calculated at the statutory rate to our provision for income taxes is as follows (in thousands):

	Year Ended December 31,		
	2024	2023	2022
Tax benefit at federal statutory rate	$ (13,701)	$ (15,995)	$ (6,996)
State taxes	(3,133)	(2,208)	(494)
Research and development credits	(419)	(925)	(1,793)
Foreign operations taxed at different rates	—	—	78
Stock-based compensation	1,930	1,967	239
Other nondeductible items	(108)	438	(238)
Executive compensation	306	152	80
Change in valuation allowance	15,159	16,640	9,400
Provision for income taxes	$ 34	$ 69	$ 276

Deferred income taxes reflect the net tax effects of (a) temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes, and (b) operating losses and tax credit carryforwards.

Significant components of our deferred tax assets and liabilities are as follows (in thousands):

	December 31,	
	2024	2023
Deferred tax assets:		
Net operating losses	$ 82,925	$ 72,586
Credits	17,660	16,412
Deferred revenues	48	176
Stock-based compensation	4,786	4,445
Reserves and accruals	2,650	2,774
Property and Equipment	830	457
Intangible assets	244	532
Capital losses	452	424
R&D Capitalization	28,471	26,821
Unrealized gain/loss	2	—
Lease liability	7,445	3,608
Other assets	4,362	2,542
Total deferred tax assets:	149,875	130,777
Valuation allowance	(142,994)	(127,835)
Deferred tax liabilities:		
Right-of-use assets	(6,895)	(2,958)
Total deferred tax liabilities:	(6,895)	(2,958)
Net deferred tax liabilities	$ (14)	$ (16)

ASC 740 requires that the tax benefit of NOLs, temporary differences and credit carryforwards be recorded as an asset to the extent that management assesses that realization is “more likely than not.” Realization of the future tax benefits is dependent on our ability to generate sufficient taxable income within the carryforward period. Because of our history of operating losses, management believes that recognition of the deferred tax assets arising from the above-mentioned future tax benefits is currently not more likely than not to be realized and, accordingly, has provided a valuation allowance against our deferred tax assets. Accordingly, the net deferred tax assets in all our jurisdictions have been fully reserved by a valuation allowance. The net valuation allowance increased by $15.2 million during the year ended December 31, 2024, increased by $16.7 million during the year ended December 31, 2023, and increased by $9.4 million during the year ended December 31, 2022. At such time as it is determined that it is more likely than not that the deferred tax assets are realizable, the valuation allowance will be reduced.

The following table sets forth our federal, state and foreign NOL carryforwards and federal research and development tax credits as of December 31, 2024 (in thousands):

	December 31, 2024	
	Amount	Expiration Years
Net operating losses, federal	$ 182,918	2026-2037
Net operating losses, federal	$ 158,554	Do not expire
Net operating losses, state	$ 175,040	2028-2044
Tax credits, federal	$ 19,073	2024-2044
Tax credits, state	$ 20,791	Do not expire

Current U.S. federal and California tax laws include substantial restrictions on the utilization of NOLs and tax credit carryforwards in the event of an ownership change of a corporation. Accordingly, the Company's ability to utilize NOLs and tax credit carryforwards may be limited as a result of such ownership changes. We performed an analysis in 2024 and determined that there was not a limitation that would result in the expiration of carryforwards before they are utilized.

We apply the provisions of ASC 740 to account for uncertain income taxes. A reconciliation of the beginning and ending amount of unrecognized tax benefits is as follows (in thousands):

	December 31,		
	2024	2023	2022
Balance at beginning of year	$ 20,204	$ 18,571	$ 15,261
Additions based on tax positions related to current year	1,332	2,164	3,553
Additions to tax position of prior years	82	—	—
Reductions to tax position of prior years	—	(531)	(243)
Balance at end of year	$ 21,618	$ 20,204	$ 18,571

We recognize interest and penalties as a component of our income tax expense. Total interest and penalties recognized in the consolidated statements of operations were $42 thousand, $42 thousand and $42 thousand in 2024, 2023 and 2022, respectively. Total penalties and interest recognized in the balance sheet was $0.6 million, $0.6 million and $0.5 million as of December 31, 2024, 2023 and 2022, respectively. The total unrecognized tax benefits that, if recognized currently, would impact our company's effective tax rate were $0.3 million as of December 31, 2024, 2023 and 2022. We do not expect any material changes to our uncertain tax positions within the next 12 months. We are not subject to examination by United States federal or state tax authorities for years prior to 2002 and foreign tax authorities for years prior to 2014.

Note 13. 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 operated by 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 "Chesapeake Space").

We entered into the initial lease with MetLife for our facilities in Redwood City in 2003 and the RWC Lease has been amended multiple times since then to adjust the leased space and terms of the Lease. In December 2024, we entered into a Ninth Amendment to the Lease (the "Ninth Amendment") with MetLife with respect to the Penobscot Space and the Chesapeake Space to extend the term of the Lease for additional periods. Pursuant to the Ninth Amendment, the term of the lease of for both the Penobscot Space and the Chesapeake Space has been extended through August 2032. 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 Chesapeake Space for five (5) years. The Ninth Amendment provided a net tenant improvement allowance of $3.0 million.

As a result of the lease extension, the Company remeasured the lease liability and adjusted the corresponding right-of-use asset based on the updated lease payments. The impact of this remeasurement, which included a non-cash increase in both the lease liability and right-of-use asset, was recorded as of December 31, 2024.

The tables below show the balance of right-of-use assets and lease obligations as of January 1, 2024 and the balance as of December 31, 2024, including the changes during the period (in thousands):

	Right-of-use Assets - Operating Lease, net
Right-of-use assets - Operating leases, net, at January 1, 2024	$ 13,137
Amortization of right-of-use assets	(3,184)
Addition due to lease modification	18,747
Right-of-use assets - Operating leases, net, at December 31, 2024	$ 28,700

	Lease Obligations - Operating Leases
Lease obligations - Operating leases, net, at January 1, 2024	$ 16,024
Lease payments	(4,727)
Interest accretion	946
Addition due to lease modification	18,747
Lease obligations - Operating leases, net, at December 31, 2024	$ 30,990

In July 2023, we announced our plan to consolidate operations from our previous San Carlos facility to our headquarters in Redwood City. On September 1, 2023, the Company entered into an Assignment and Assumption of Lease (the "Assignment Agreement") with Vaxcyte, Inc. ("Vaxcyte") to assign to Vaxcyte all of the Company's right, title and interest in, under and to the San Carlos facility and the related Lease Agreement, dated as of January 29, 2021. On September 6, 2023, the Company, Vaxcyte and ARE-San Francisco No. 63, LLC ("ARE") entered into a Consent to Assignment and First Amendment pursuant to which ARE consented to the Assignment Agreement and the assignment by the Company and the assumption by Vaxcyte of the Company's interest as tenant in the lease. The effective date of the assignment was October 1, 2023.

As a result of the Assignment Agreement, the Company remeasured the lease obligation for the San Carlos facility to its present value of $3.1 million and wrote off the remaining lease liability of $19.6 million and the corresponding right of use asset balance. Simultaneously, the Company determined that indicators of impairment existed because the lease assignment impacts the utilization of the related right of use assets and leasehold improvements in the San Carlos facility, and therefore performed a recoverability test by estimating future undiscounted net cash flows expected to be generated from the use of these assets. As there were no substantial future cash inflows associated with these assets, the carrying values of these assets were deemed unrecoverable. As a result, during the third quarter of 2023, the Company recognized a non-cash impairment charge of $7.7 million, of which $4.7 million was related to leasehold improvements and $3.0 million for the right of use assets, presented within the asset impairment and other charges line item in the consolidated statements of operations in the year ended December 31, 2023.

As part of the plan, the Company entered into agreements to sell certain laboratory equipment previously located in the San Carlos facility through an asset auction and as part of the lease assignment of the San Carlos facility to Vaxcyte. These certain items of laboratory equipment met the assets held for sale criteria and were sold during the fourth quarter of 2023. Using a fair value estimate based on Level 3 inputs in the fair value hierarchy, the Company determined that the carrying value of these assets exceeds fair value less costs to sell, which resulted in a write-down of $1.5 million, presented within the asset impairment and other charges line item in the consolidated statements of operations in the year ended December 31, 2023.

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 December 31, 2024 and 2023, and are recorded as non-current restricted cash on the consolidated balance sheets.

We are required to restore certain areas of the Redwood City facility that we are renting to its original form. We are expensing the asset retirement obligation over the term of the Redwood City lease. We review the estimated obligation each reporting period and make adjustments if our estimates change. We recorded asset retirement obligations of $0.3 million as of December 31, 2024 and 2023, which are included in other liabilities on the consolidated balance sheets. Accretion expense related to our asset retirement obligations was nominal in the years ended December 31, 2024 and 2023.

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):

	Year Ended December 31,		
	2024	2023	2022
Finance lease costs	$ —	$ —	$ 18
Operating lease cost	4,130	6,310	7,321
Short-term lease costs[1]	—	—	40
Total lease cost[2]	$ 4,130	$ 6,310	$ 7,379

[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.

Amounts included in the measurement of lease obligations (in thousands):

	Year Ended December 31,		
	2024	2023	2022
Cash paid:			
Operating cash flows from operating leases	$ 4,727	$ 9,897	$ 6,506

	Operating Lease
Other information:	
Weighted-average remaining lease term (in years)	7.6
Weighted-average discount rate	7.0 %

As of December 31, 2024, 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
2025	$ 4,868
2026	5,014
2027	4,053
2028	5,400
2029	5,365
Thereafter	15,695
Total minimum lease payments	40,395
Less: imputed interest	9,405
Lease obligations	$ 30,990
Reconciliation of operating lease liabilities as shown within the consolidated balance sheets:	
Current portion of lease obligations - Operating leases	$ 2,827
Long-term lease obligations - Operating leases	28,163
Total operating lease liabilities	$ 30,990

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. As of December 31, 2024, the future minimum payments that we expect to pay, including potential obligations under services agreements subject to risk of cancellation by us, is minimal.

Credit Facility

On June 30, 2017, we entered into a credit facility (the "Credit Facility") with Western Alliance Bank consisting of term loans ("Term Debt") up to $10.0 million, and advances under a revolving line of credit of up to $5.0 million with an accounts receivable borrowing base of 80% of eligible accounts receivable. The right to take draws on the Term Debt expired on December 31, 2022. In March 2023, we terminated the Credit Facility with Western Alliance Bank.

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 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.

We are currently not a party to any material pending litigation or other material legal proceedings that management believes could have a material adverse effect on our financial statements.

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 14. Debt

Innovatus Loan Agreement

On February 13, 2024 (the "Closing Date"), we entered into a five-year term loan and security agreement (the "Loan Agreement") with Innovatus Life Sciences Lending Fund I, LP ("Innovatus"), an affiliate of Innovatus Capital Partners, LLC, for an aggregate principal amount of up to $40.0 million and with a maturity date of February 13, 2029 (the "Innovatus Loan"). The Innovatus Loan consists of two tranches, of which the first tranche of $30.0 million was funded on February 13, 2024. We will be eligible to draw down the second tranche of $10.0 million upon achievement of certain milestones including certain pre-specified revenue thresholds and subject to a payment of a facility fee equal to 1.00% of the amount of such term loan.

The floating per annum interest rate of the Innovatus Loan is equal to the sum of (a) the greater of (i) prime rate published in the Money Rates section of the Wall Street Journal and (ii) 7.50%, plus (b) 3.25%; provided that, at the election of the Company, up to 2.0% of such rate shall be payable in-kind until the third anniversary of the closing date. The Company is required to make monthly interest-only payments through February 1, 2027 (with the ability to extend the interest-only period through February 1, 2028 upon the achievement of certain pre-specified financial milestones), after which the Company is required to make monthly amortizing payments, with the remaining balance of the principal plus accrued and unpaid interest due at maturity. 2.0% of the interest is payable in-kind for the first three years of the term by increasing the principal balance. Prepayments of the loan, in whole or in part, will be subject to an early prepayment fee which ranges between 3.0% and 1.0% and declines each year until the third anniversary date of the Closing Date, after which no prepayment fee is required. The Company is also required to pay an exit fee upon any payment or prepayment equal to 3.0% of the aggregate principal amount of the tranches funded under the Innovatus Loan.

The Innovatus Loan contains customary representations and warranties and covenants, subject to customary carve outs, and includes financial covenants related to liquidity and net product revenue, with the latter beginning with the period ended December 31, 2024. The Innovatus Loan is secured by perfected first priority liens on the Company's assets, and the Loan Agreement includes a negative pledge by the Company which prohibits the Company from permitting liens to be placed upon the Company's intellectual property in favor of any party other than Innovatus.

In connection with the issuance of the Innovatus Loan, we recorded a debt discount of $1.3 million and capitalized debt issuance costs of $0.6 million. The discount and issuance costs will be amortized over the life of the Innovatus Loan. Interest expense for the Innovatus Loan for the year ended December 31, 2024 was $3.5 million, and is inclusive of non-cash amortization of the debt discount, debt issuance costs, payable in-kind interest, and accretion of final payment. The carrying amount of the Innovatus Loan approximates fair value given its recent issuance and the interest rate is based on the current prime rate. The effective interest rate for the Innovatus Loan was 13.1% as of December 31, 2024.

Additionally, in connection with entering into the Innovatus Loan, we entered into a Warrant Agreement with Innovatus on February 13, 2024 and issued to Innovatus a warrant to purchase an aggregate of 424,028 shares of the Company's common stock at an exercise price of $2.83 per share. The warrants may be exercised on a cashless basis, and are immediately exercisable through the 10th anniversary of the issuance date. At the time of issuance, the Company determined the estimated fair value of the warrants of $0.9 million using the Black-Scholes model. As the warrants represent a freestanding equity instrument, the Company recorded the fair value of the warrants in additional paid-in capital during the first quarter of 2024.

The Company accounts for the amortization of the debt discount and issuance costs utilizing the effective interest method. Long-term debt consisted of the following at December 31, 2024 (in thousands):

	December 31, 2024
Face value of debt	$ 30,000
Add: payment in-kind interest	483
Add: amortized exit fee	125
Less: unamortized debt discount	(1,151)
Less: unamortized debt issuance costs	(552)
Total long-term debt	$ 28,905

The future principal payments under the Innovatus Loan are as follows (in thousands):

Years Ending December 31,	
2025	$ —
2026	—
2027	13,264
2028	15,917
2029	2,653
Total principal payments	31,834
Add: amortized exit fee	125
Less: uncapitalized payment in-kind interest	(1,351)
Less: unamortized debt issuance fee	(1,151)
Less: unamortized debt issuance costs	(552)
Total long-term debt	$ 28,905

Note 15. Segment, Geographical and Other Revenue Information

Segment Information

We previously managed our business as two business segments, Performance Enzymes and Novel Biotherapeutics. During the fourth quarter of 2023, we made changes to the structure of our organization in connection with the restructuring of our business that we announced in July 2023, including the discontinuation of investment in certain development programs, primarily in our biotherapeutics business, consolidation of operations to our Redwood City, California headquarters, and headcount reduction. In connection with these organizational structure changes, corresponding changes were made to how our business is managed, how results are reported internally and how our CEO, our chief operating decision maker ("CODM"), assesses performance and allocates resources. As a result of these changes, our previous Performance Enzymes and Novel Biotherapeutics operating segments were combined into a single reportable segment. We believe that these changes better align internal resources and external go to market activities in order to create a more efficient and effective organizational structure. Under this new organizational and reporting structure, we managed our business as one reportable segment since the fourth quarter of 2023.

Effective October 1, 2023, the Company's operations are managed and reported to the CODM on a consolidated basis. The CODM uses consolidated income (loss) from operations and net income (loss) to assess financial performance and make resource allocation decisions. These financial measures are used by the CODM to balance short-term financial results with long-term strategic goals, guiding the allocation of budget between product costs, research and development, and general, selling and administrative expenses.

As a result of the restructuring of our business, the Company determined that a triggering event had occurred that required an interim goodwill impairment test during the third quarter of 2023. The fair value estimate used in the interim goodwill impairment test was primarily based on Level 3 inputs in the fair value hierarchy. Based on the results of the impairment evaluation, the Company determined that the goodwill within the Novel Biotherapeutics reporting unit was impaired, which resulted in a non-cash impairment charge of $0.8 million to write off all of the associated goodwill. The impairment charge is recorded within asset impairment and other charges in the consolidated statements of operation for the year ended December 31, 2023.

Significant Customers

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

	Percentage of Total Revenues For the Year Ended December 31,		
	2024	2023	2022
Customer A	18 %	22 %	56 %
Customer B	13 %	*	*
Customer C	10 %	*	*
Customer D	10 %	*	*
Customer E	*	13 %	*

** Percentage was less than 10%*

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

	As of December 31,	
	2024	2023
Customer B	16 %	12 %
Customer D	18 %	12 %
Customer F	12 %	*
Customer G	10 %	*
Customer H	*	21 %
Customer I	*	13 %

** Percentage was less than 10%*

Geographical Information

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

	Year Ended December 31,		
	2024	2023	2022
Revenues			
Americas[1]	$ 21,278	$ 13,733	$ 17,000
EMEA[2][3]	10,359	22,907	56,540
APAC[4][5][6]	27,708	33,503	65,050
Total revenues	$ 59,345	$ 70,143	$ 138,590

[1] United States revenue was $21.3 million, $13.7 million, and $17.0 million, for the years ended December 31, 2024, 2023, and 2022, respectively
[2] Ireland revenue was $1.8 million, $0.5 million, and $37.2 million, for the years ended December 31, 2024, 2023, and 2022, respectively
[3] Switzerland revenue was $3.4 million, $11.1 million, and $9.2 million, for the years ended December 31, 2024, 2023, and 2022, respectively
[4] China revenue was $9.8 million, $20.3 million, and $48.6 million, for the years ended December 31, 2024, 2023, and 2022, respectively
[5] India revenue was $7.3 million, $5.7 million, and $8.8 million, for the years ended December 31, 2024, 2023, and 2022, respectively
[6] Singapore revenue was $6.2 million, $2.4 million, and $3.2 million, for the years ended December 31, 2024, 2023, and 2022, respectively

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

	December 31,	
	2024	2023
United States	$ 43,098	$ 28,624

Note 16. Restructuring Charges

In July 2023, in alignment with our enhanced strategic focus, we announced a restructuring of our business, including a plan for a workforce reduction of approximately 25%. During the year ended December 31, 2023, we recorded a restructuring charge related to this workforce reduction of $3.1 million related to severance and related benefit costs. The plan was substantially completed in September 2023 and severance costs were paid through the fourth quarter of 2023. We do not expect to record any significant future charges related to the restructuring plan.

In November 2022, we announced a plan for a workforce reduction of approximately 18% to realign and optimize our workforce requirements in alignment with our refined corporate strategy. The plan was substantially completed in December 2022 and severance costs were paid through the third quarter of 2023. During the years ended December 31, 2023 and 2022, we recorded restructuring charges of $0.2 million and $3.2 million, respectively, related to severance, bonus and other termination benefits in connection with the workforce reduction announced in November 2022.

We do not expect to record any future charges related to the restructuring plans initiated in 2023 and 2022.

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURES

None.

ITEM 9A. CONTROLS AND PROCEDURES

Evaluation of Disclosure Controls and Procedures

Our management, under the supervision of our Chief Executive Officer and Chief Financial Officer and with the participation of our disclosure committee, evaluated the effectiveness of the design and operation of our disclosure controls and procedures as of December 31, 2024. The term "disclosure controls and procedures," as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act, means controls and other procedures of a company that are designed to ensure that information required to be disclosed by us in the reports that we file or submit under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms. Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed by us in the reports that we file or submit under the Exchange Act is accumulated and communicated to our management, including our Chief Executive Officer and Chief Financial Officer, as appropriate, to allow timely decisions regarding required disclosure. Based on this evaluation, our Chief Executive Officer and Chief Financial Officer concluded that our disclosure controls and procedures were effective as of December 31, 2024 at the reasonable assurance level.

Management's Report on Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Exchange Act Rules 13a-15(f) and 15d-15(f). Internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external reporting purposes in accordance with United States generally accepted accounting principles.

Under the supervision and with the participation of our management, including our Chief Executive Officer and Chief Financial Officer, we conducted an evaluation of the effectiveness of our internal control over financial reporting as of December 31, 2024 based on the guidelines established in *Internal Control-Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO"). Based on the results of our evaluation, our management concluded that our internal control over financial reporting was effective as of December 31, 2024. We reviewed the results of management's assessment with our Audit Committee.

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.

Changes in Internal Control over Financial Reporting

There were no changes in our internal control over financial reporting (as defined in Rule 13a-15(f) of the Exchange Act) identified in connection with the evaluation required by paragraph (d) of Rule 13a-15 or 15d-15 of the Exchange Act, which occurred during the fourth fiscal quarter of the year ended December 31, 2024, which has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

ITEM 9B. OTHER INFORMATION

Rule 10b5-1 Trading Arrangements

During the three months ended December 31, 2024, none of the directors or executive officers of the Company adopted or terminated any contracts, instructions, or written plans for the purchase or sale of our securities that were intended to meet the affirmative defense conditions of Rule 10b5-1(c) or any other "non-Rule 10b5-1 trading arrangement."

ITEM 9C. DISCLOSURE REGARDING FOREIGN JURISDICTIONS THAT PREVENT INSPECTIONS

Not applicable.

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

We have adopted a code of ethics applicable to our principal executive, financial and accounting officers and all persons performing similar functions. A copy of our code of ethics is available on our principal corporate website at www.codexis.com in the Investors section under "Corporate Governance."

The information required by this item is incorporated by reference from the information that will be set forth in the 2025 Proxy Statement.

The Company has adopted an insider trading policy which governs transactions in our securities by the Company and its directors, officers, employees, and consultants, and is reasonably designed to promote compliance with insider trading laws, rules and regulations, as well as listing standards, applicable to the Company. A copy of our insider trading policy is filed with this Annual Report on Form 10-K as Exhibit 19.1.

ITEM 11. EXECUTIVE COMPENSATION

The information required by this item is incorporated by reference from the information that will be set forth in the 2025 Proxy Statement.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

The information required by this item is incorporated by reference from the information that will be set forth in the 2025 Proxy Statement.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS,

AND DIRECTOR INDEPENDENCE

The information required by this item is incorporated by reference from the information that will be set forth in the 2025 Proxy Statement.

ITEM 14. PRINCIPAL ACCOUNTING FEES AND SERVICES

The information required by this item is incorporated by reference from the information that will be set forth in the 2025 Proxy Statement.

PART IV

ITEM 15. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES

1. Financial Statements: See “Index to Consolidated Financial Statements” in Part II, Item 8 of this Annual Report on Form 10-K

2. Exhibits: The exhibits listed in the accompanying index to exhibits are filed or incorporated by reference as part of this Annual Report on Form 10-K.

EXHIBIT INDEX

Exhibit No.	Description
1.1	Equity Distribution Agreement, dated as of May 7, 2021, between Codexis, Inc. and Piper Sandler & Co. (incorporated by reference to Exhibit 1.1 to the Company's Current Report on Form 8-K, filed on May 7, 2021).
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	Certificate of Amendment to the Amended and Restated Certificate of Incorporation of Codexis, Inc., filed with the Secretary of the State of the State of Delaware on June 14, 2023 (incorporated by reference to Exhibit 3.1 to the Company's Current Report on Form 8-K, filed on June 16, 2023).
3.4	Second Amended and Restated Bylaws of Codexis, Inc. effective as of November 7, 2024 (incorporated by reference to Exhibit 3.1 to the Company's Current Report on Form 8-K, filed on November 12, 2024).
4.1	Reference is made to Exhibits 3.1 through 3.4.
4.2	Form of the Company's Common Stock Certificate (incorporated by reference to Exhibit 4.1 to the Company's Quarterly Report on Form 10-Q for the quarter ended June 30, 2012, filed on August 9, 2012).
4.3	Form of Warrant to Purchase Common Stock for Codexis, Inc., issued pursuant to the Loan and Security Agreement by and between the Company and Innovatus Life Sciences Fund I, LP. (incorporated by reference to Exhibit 4.1 to the Company's Current Report on Form 8-K, filed on February 13, 2024).
4.4	Description of Codexis' Securities Registered Pursuant to Section 12 of the Securities Exchange Act of 1934 (incorporated by reference to Exhibit 4.4 to the Company's Annual Report on Form 10-K for the year ended December 31, 2023, filed on February 28, 2024).
10.1A*	Lease Agreement by and between the Company and Metropolitan Life Insurance Company commencing as of February 1, 2004.
10.1B*	Amendment to Lease Agreement by and between the Company and Metropolitan Life Insurance Company dated as of June 1, 2004.
10.1C*	Amendment to Lease Agreement by and between the Company and Metropolitan Life Insurance Company dated as of March 9, 2007.
10.1D*	Amendment to Lease Agreement by and between the Company and Metropolitan Life Insurance Company dated as of March 31, 2008.
10.1E	Fourth Amendment to Lease Agreement by and between the Company and Metropolitan Life Insurance Company dated as of September 17, 2010 (incorporated by reference to Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2010, filed on November 4, 2010).
10.1F	Fifth Amendment to Lease Agreement by and between the Company and Metropolitan Life Insurance Company dated as of March 16, 2011 (incorporated by reference to Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q for the quarter ended March 31, 2011, filed on May 6, 2011).

Exhibit No.	Description
10.1G	Sixth Amendment to Lease by and between the Company and Metropolitan Life Insurance Company dated as of September 27, 2012 (incorporated by reference to Exhibit 10.6 to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2012, filed on November 7, 2012).
10.1H	Seventh Amendment to Lease by and between the Company and Metropolitan Life Insurance Company dated as of October 11, 2016 (incorporated by reference to Exhibit 10.3 to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2016, filed on November 8, 2016).
10.1I	Eighth Amendment to Lease, dated as of February 8, 2019, by and between the Company and Metropolitan Life Insurance Company (incorporated by reference to Exhibit 10.3 to the Company's Quarterly Report on Form 10-Q for the quarter ended March 31, 2019, filed on May 8, 2019).
10.1J***	Ninth Amendment to Lease, dated as of December 4, 2024, by and between the Company and Metropolitan Life Insurance Company.
10.2+*	Codexis, Inc. 2010 Equity Incentive Award Plan and Form of Stock Option Agreement.
10.3A+	Codexis, Inc. 2019 Incentive Award Plan (incorporated by reference to Exhibit 99.1 to the Company's Registration Statement on Form S-8 (File No. 333-232262) filed with the SEC on June 21, 2019).
10.3B+	Form of Restricted Stock Unit Award Grant Notice and Restricted Stock Unit Award Agreement under 2019 Incentive Award Plan (incorporated by reference to Exhibit 99.2 to the Company's Registration Statement on Form S-8 (File No. 333-232262) filed with the SEC on June 21, 2019).
10.3C+	Form of Stock Option Grant Notice and Stock Option Agreement under 2019 Incentive Award Plan (incorporated by reference to Exhibit 99.3 to the Company's Registration Statement on Form S-8 (File No. 333-232262) filed with the SEC on June 21, 2019).
10.3D+	Form of Stock Option Grant Notice and Stock Option Agreement under 2019 Incentive Award Plan (incorporated by reference to Exhibit 99.4 to the Company's Registration Statement on Form S-8 (File No. 333-232262) filed with the SEC on June 21, 2019).
10.3E+	Form of Performance Stock Unit Award Grant Notice and Performance Stock Unit Award Agreement under 2019 Incentive Award Plan (incorporated by reference to Exhibit 99.5 to the Company's Registration Statement on Form S-8 (File No. 333-232262) filed with the SEC on June 21, 2019).
10.3F+	Form of Restricted Stock Award Grant Notice and Restricted Stock Award Agreement under 2019 Incentive Award Plan (incorporated by reference to Exhibit 99.6 to the Company's Registration Statement on Form S-8 (File No. 333-232262) filed with the SEC on June 21, 2019).
10.3G+	Amendment to the Codexis, Inc. 2019 Incentive Award Plan (incorporated by reference to Exhibit 3.1 to the Company's Current Report on Form 8-K, filed on June 16, 2023).
10.4A+	Codexis, Inc. 2022 Employment Inducement Award Plan (incorporated by reference to Exhibit 99.1 to the Company's Registration Statement on Form S-8 (File No. 333-269163) filed with the SEC on January 9, 2023).
10.4B+	Form of Stock Option Grant Notice and Stock Option Agreement under the 2022 Employment Inducement Award Plan (incorporated by reference to Exhibit 99.2 to the Company's Registration Statement on Form S-8 (File No. 333-269163) filed with the SEC on January 9, 2023).
10.4C+	Form of Restricted Stock Unit Award Grant Notice and Restricted Stock Unit Award Agreement under the 2022 Employment Inducement Award Plan (incorporated by reference to Exhibit 99.3 to the Company's Registration Statement on Form S-8 (File No. 333-269163) filed with the SEC on January 9, 2023).

Exhibit No.	Description
10.5A+	Codexis, Inc. 2023 Employee Stock Purchase Plan (incorporated by reference to Exhibit 3.1 to the Company's Current Report on Form 8-K, filed on June 16, 2023).
10.5B	Amendment to the Codexis, Inc. 2023 Employee Stock Purchase Plan. (incorporated by reference to Exhibit 10.2 to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2024, filed on October 31, 2024).
10.6	Form of Indemnification Agreement between the Company and each of its directors, officers and certain employees (incorporated by reference to Exhibit 10.4 to the Company's Annual Report on Form 10-K for the year ended December 31, 2022, filed on February 27, 2023).
10.7+	Form of Amended and Restated Change in Control Severance Agreement between the Company and certain of its officers (incorporated by reference to Exhibit 10.2 to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2019, filed on November 6, 2019).
10.8	Asset Purchase Agreement, dated October 28, 2010, by and among the Company, Codexis Mayflower Holdings, LLC and Maxygen, Inc. (incorporated by reference to Exhibit 2.1 to the Company's Current Report on Form 8-K, filed on October 28, 2010).
10.9A+	Employment Agreement by and between the Company and Ross Taylor effective as of August 4, 2019 (incorporated by reference to Exhibit 10.3 to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2019, filed on November 6, 2019).
10.9B+	Transition and Separation Agreement by and between the Company and Ross Taylor, dated as of February 3, 2023 (incorporated by reference to Exhibit 10.8B to the Company's Annual Report on Form 10-K for the year ended December 31, 2022, filed on February 27, 2023).
10.10A+	Employment Agreement by and between the Company and John Nicols effective as of May 28, 2012 (incorporated by reference to Exhibit 10.2 to the Company's Quarterly Report on Form 10-Q for the quarter ended June 30, 2012, filed on August 9, 2012).
10.10B+	Amendment to Employment Agreement between the Company and John Nicols, dated April 21, 2016 (incorporated by reference to Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q for the quarter ended June 30, 2016, filed on August 9, 2016).
10.10C+	Amendment to Employment Agreement between the Company and John Nicols, dated November 16, 2017 (incorporated by reference to Exhibit 10.8E to the Company's Annual Report on Form 10-K for the year ended December 31, 2017, filed on March 15, 2018).
10.10D+	Amendment to Employment Agreement between the Company and John Nicols, effective as of June 28, 2019 (incorporated by reference to Exhibit 10.4 to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2019, filed on November 6, 2019).
10.10E+	Transition and Separation Agreement by and between the Company and John Nicols, dated as of July 18, 2022 (incorporated by reference to Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2022, filed on November 4, 2022).
10.11	Acquisition Agreement by and among the Company, Societé des Produits Nestlé S.A., formerly known as Nestec Ltd. ("Nestlé Health Science"), effective as of December 26, 2023. (incorporated by reference to Exhibit 10.11 to the Company's Annual Report on Form 10-K for the year ended December 31, 2023, filed on February 28, 2024).
10.12A	Lease Agreement by and between the Company and ARE-SAN FRANCISCO NO. 63, LLC dated as of January 29, 2021 (incorporated by reference to Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q for the quarter ended March 31, 2021, filed on May 7, 2021).
10.12B	Assignment and Assumption of Lease by and between the Company and Vaxcyte, Inc. dated as of September 1, 2023 (incorporated by reference to Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2023, filed on November 3, 2023).

Exhibit No.	Description
10.12C	Consent to Assignment and First Amendment to Lease Agreement by and between the Company, Vaxcyte Inc. and ARE-San Francisco No. 63, LLC dated as of September 6, 2023 (incorporated by reference to Exhibit 10.2 to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2023, filed on November 3, 2023).
10.13+	Employment Agreement by and between the Company and Stephen Dilly dated as of August 9, 2022 (incorporated by reference to Exhibit 10.2 to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2022, filed on November 4, 2022).
10.14A+	Offer Letter by and between the Company and Kevin Norrett dated as of September 12, 2022 (incorporated by reference to Exhibit 10.3 to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2022, filed on November 4, 2022).
10.14B+	Change in Control Severance Agreement by and between the Company and Kevin Norrett dated September 12, 2022 (incorporated by reference to Exhibit 10.4 to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2022, filed on November 4, 2022).
10.15A+	Offer Letter by and between the Company and Sriram Ryali dated as of December 30, 2023 (incorporated by reference to Exhibit 10.23A to the Company's Annual Report on Form 10-K for the year ended December 31, 2022, filed on February 27, 2023).
10.15B+	Change in Control Severance Agreement by and between the Company and Sriram Ryali dated January 27, 2023 (incorporated by reference to Exhibit 10.23B to the Company's Annual Report on Form 10-K for the year ended December 31, 2022, filed on February 27, 2023).
10.15C+***	Separation and Consulting Agreement by and between the Company and Sriram Ryali dated October 16, 2024.
10.16A	Loan and Security Agreement by and between the Company and Innovatus Life Sciences Fund I, LP, effective as of February 13, 2024 (incorporated by reference to Exhibit 10.17 to the Company's Annual Report on Form 10-K for the year ended December 31, 2023, filed on February 28, 2024).
10.16B	First Amendment to the Loan and Security Agreement, dated May 1, 2024, by and between the Company and Innovatus Life Sciences Fund I, LP. (incorporated by reference to Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q for the quarter ended June 30, 2024, filed on August 8, 2024).
10.16C	Second Amendment to the Loan and Security Agreement, dated December 20, 2024, by and between the Company and Innovatus Life Sciences Fund I, LP.
10.17+	Codexis, Inc. 2024 Inducement Plan (incorporated by reference to Exhibit 4.1 to the Company's Registration Statement on Form S-8 (File No. 333-281429) filed with the SEC on August 9, 2024).
10.18A+	Offer Letter by and between the Company and Georgia Erbez, dated as of September 30, 2024. (incorporated by reference to Exhibit 10.3 to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2024, filed on October 31, 2024).
10.18B+	Change in Control Severance Agreement by and between the Company and Georgia Erbez, dated as of September 30, 2024. (incorporated by reference to Exhibit 10.4 to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2024, filed on October 31, 2024).
10.19A+	Offer Letter by and between the Company and Alison Moore, dated as of September 30, 2024. (incorporated by reference to Exhibit 10.5 to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2024, filed on October 31, 2024).
10.19B+	Change in Control Severance Agreement by and between the Company and Alison Moore, dated as of September 30, 2024. (incorporated by reference to Exhibit 10.6 to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2024, filed on October 31, 2024).
19.1	Codexis Insider Trading Policy effective as of May 9, 2024
23.1	Consent of KPMG LLP, independent registered public accounting firm.

Exhibit No.	Description
23.2	Consent of BDO USA, P.C., independent registered public accounting firm.
24.1	Power of Attorney (see signature page to this Annual Report on Form 10-K).
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.
97.1	Codexis, Inc. Clawback Policy effective as of August 24, 2023
101	The following materials from Registrant's Annual Report on Form 10-K for the fiscal year ended December 31, 2024 formatted in Inline Extensible Business Reporting Language (iXBRL) includes: (i) Consolidated Balance Sheets at December 31, 2024 and December 31, 2023, (ii) Consolidated Statements of Operations for the years ended December 31, 2024, December 31, 2023 and December 31, 2022, (iii) Consolidated Statements of Cash Flows for the years ended December 31, 2024, December 31, 2023 and December 31, 2022, (vi) Consolidated Statements of Stockholders' Equity for the years ended December 31, 2023, December 31, 2023 and December 31, 2022 and (vii) Notes to 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 Annual Report on Form 10-K for the fiscal year ended December 31, 2024, formatted in Inline XBRL and contained in Exhibit 101.

+ Indicates a management contract or compensatory plan or arrangement.

* Filed as exhibits to the registrant's Registration Statement on Form S-1 (File No. 333-164044), effective April 21, 2010, and incorporated herein by reference.

** Pursuant to Item 601(b)(32) of Regulation S-K this exhibit is furnished rather than filed with this report.

*** Portions of the exhibit, marked by brackets, have been omitted because the omitted information is (i) not material and (ii) customarily and actually treated as private or confidential.

ITEM 16. FORM 10-K SUMMARY

Not applicable.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the Registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

CODEXIS, INC.

Date: February 27, 2025

By: /s/ Stephen Dilly
Chairman of the Board of Directors, President, and Chief Executive Officer
(Principal Executive Officer)

POWER OF ATTORNEY

Each person whose individual signature appears below hereby authorizes and appoints Stephen Dilly and Georgia Erbez, and each of them, with full power of substitution and resubstitution and full power to act without the other, as his or her true and lawful attorney-in-fact and agent to act in his or her name, place and stead and to execute in the name and on behalf of each person, individually and in each capacity stated below, and to file any and all amendments to this annual report on Form 10-K and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing, ratifying and confirming all that said attorneys-in-fact and agents or any of them or their or his substitute or substitutes may lawfully do or cause to be done by virtue thereof.

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the Registrant and in the capacities and on the dates indicated.

SIGNATURE	TITLE		DATE
/s/ Stephen Dilly Stephen Dilly	Chairman of the Board of Directors, President, and Chief Executive Officer (Principal Executive Officer)	Date:	February 27, 2025
/s/ Georgia Erbez Georgia Erbez	Chief Financial Officer (Principal Financial and Accounting Officer)	Date:	February 27, 2025
/s/ Raymond De Vré Raymond De Vré	Director	Date:	February 27, 2025
/s/ Byron L. Dorgan Byron L. Dorgan	Director	Date:	February 27, 2025
/s/ Esther Martinborough Esther Martinborough	Director	Date:	February 27, 2025
/s/ H. Stewart Parker H. Stewart Parker	Director	Date:	February 27, 2025
/s/ Christos Richards Christos Richards	Director	Date:	February 27, 2025
/s/ Rahul Singhvi Rahul Singhvi	Director	Date:	February 27, 2025
/s/ David V. Smith David V. Smith	Director	Date:	February 27, 2025
/s/ Dennis P. Wolf Dennis P. Wolf	Director	Date:	February 27, 2025

[***] Certain marked information has been omitted from this exhibit because it is both not material and is the type that the Registrant treats as private or confidential.

NINTH AMENDMENT TO LEASE

This Ninth Amendment to Lease ("**Amendment**") is made effective, and dated for reference purposes, as of December 4, 2024 (the "**Effective Date**") by and between METROPOLITAN LIFE INSURANCE COMPANY, a New York corporation ("**Landlord**"), and CODEXIS, INC., a Delaware corporation ("**Tenant**"), with reference to the following facts ("**Recitals**"):

A. Landlord and Tenant are the parties to that certain lease which is comprised of the following (collectively, the "**Existing Lease**"): that certain Lease, dated October [sic], 2003, entered into by and between Tenant, as tenant and Landlord, as landlord ("**Original Lease**"); as amended by that certain First Amendment to Lease dated as of June 1, 2004, that certain Second Amendment to Lease ("**Second Amendment**") dated as of March 9, 2007, that certain Third Amendment to Lease ("**Third Amendment**") dated as of March 31, 2008, that certain Fourth Amendment to Lease dated as of September 17, 2010, that certain Fifth Amendment to Lease (the "**Fifth Amendment**") dated March 16, 2011, that certain Sixth Amendment to Lease (the "**Sixth Amendment**") dated September 27, 2012, that certain Seventh Amendment to Lese dated October 11, 2016, and that certain Eighth Amendment to Lease ("**Eighth Amendment**") dated February 8, 2019, for certain premises (the "**Premises**") containing approximately **77,100** rentable square feet, comprised of the following: (i) approximately 11,020 rentable square feet commonly known as 501 Chesapeake Drive, Redwood City, California (the "**Chesapeake Space**"),
(ii) approximately 10,597 rentable square feet commonly known as 200 Penobscot Drive, Redwood City, California (the "**200 Penobscot Space**"), (iii) approximately 17,627 rentable square feet commonly known as 220 Penobscot Drive, Redwood City, California (the "**220 Penobscot Space**"); and (iv) approximately 37,856 rentable square feet commonly known as 400 Penobscot Drive, Redwood City, California (the "**400 Penobscot Space**"), in the Project (commonly known as Seaport Centre in Redwood City, California), all as more particularly described in the Existing Lease.

B. Landlord and Tenant desire to provide for (i) the extension of the Term for the Premises; and (ii) other amendments of the Existing Lease as more particularly set forth below.

NOW, THEREFORE, in consideration of the foregoing, and of the mutual covenants set forth herein and of other good and valuable consideration, the receipt and adequacy of which are hereby acknowledged, the parties hereto agree as follows:

SECTION 1. SCOPE OF AMENDMENT; DEFINED TERMS. Except as expressly provided in this Amendment, the Existing Lease shall remain in full force and effect. Should any inconsistency arise between this Amendment and the Existing Lease as to the specific matters which are the subject of this Amendment, the terms and conditions of this Amendment shall control. All capitalized terms used in this Amendment and not defined herein shall have the meanings set forth in the Existing Lease unless the context clearly requires otherwise; provided, however, that the term "Lease" as used herein and, from and after the Effective Date, in the Existing Lease shall refer to the Existing Lease as modified by this Amendment. The "200 Penobscot Space", the "220 Penobscot Space" and the "400 Penobscot Space" are sometimes collectively referred to as the "**Penobscot Space**".

SECTION 2. EXTENSION OF TERM FOR THE CHESAPEAKE SPACE AND THE PENOBSCOT SPACE. Landlord and Tenant acknowledge and agree that, notwithstanding any provision of the Existing Lease to the contrary, (a) the current Term, solely with respect to the Chesapeake Space, pursuant to the Existing Lease will expire on May 31, 2029, and that the Term of the Lease solely for the Chesapeake Space is hereby extended for the period of thirty-nine (39) months (the "**Chesapeake Fifth Extended Term**") commencing on June 1, 2029 (the "**Chesapeake Fifth Extension Date**") and expiring August 31, 2032 (hereafter, the "**Extended Expiration Date**"), unless sooner terminated pursuant to the terms of the

Lease; and (b) the current Term, solely with respect to the Penobscot Space, pursuant to the Existing Lease will expire May 31, 2027, and that the Term of the Lease solely for the Penobscot Space is hereby extended for the period of sixty-three (63) months (the "**Penobscot Second Extended Term**") commencing on June 1, 2027 (the "**Penobscot Second Extension Date**") and expiring on the Extended

Expiration Date. Landlord and Tenant acknowledge and agree that this Amendment provides all rights and obligations of the parties with respect to the Extended Term, whether or not in accordance with any other provisions, if any, of the Existing Lease regarding renewal or extension; provided, however, that (x) with respect to the Chesapeake Space, Tenant shall continue to have one (1) option to extend the Term of the Lease for an additional term of five (5) years in accordance with the terms and conditions of Section 7(b) of the Sixth Amendment, and (y) with respect to the Penobscot Space, Tenant shall continue to have one (1) option to extend the Term of the Lease for an additional term of five (5) years in accordance with the terms and conditions of Section 12(b) of the Fifth Amendment, provided, however, that Tenant shall have the right to exercise such option to extend in this subclause (y) as to the 400 Penobscot Space only, as to the combined 200 and 220 Penobscot Space only, or as to the Penobscot Space in its entirety.

SECTION 3. MONTHLY BASE RENT FOR CHESAPEAKE FIFTH EXTENDED TERM. Notwithstanding any provision of the Existing Lease to the contrary, commencing on the Chesapeake Fifth Extension Date and continuing through the Extended Expiration Date, the amount of Monthly Base Rent payable by Tenant for the Chesapeake Space shall be as follows:

Period from/to	Monthly Base Rent
June 1, 2029 – May 31, 2030	$67,222.00*
June 1, 2030 – May 31, 2031	$69,238.66
June 1, 2031 – May 31, 2032	$71,315.82
June 1, 2032 – August 31, 2032	$73,455.29

*Notwithstanding anything in the foregoing to the contrary, provided that a Default (as defined in Section 11.01 of the Original Lease) by Tenant (other than the first Default in any twelve (12) month period unless such Default continues beyond three (3) business days after written notice thereof) has not previously occurred, Landlord agrees to forbear in the collection of and abate the Monthly Base Rent solely for the Chesapeake Space due and payable for the period beginning on June 1, 2029 and continuing through August 31, 2029, totaling not more than Two Hundred One Thousand Six Hundred Sixty-Six and 00/100 Dollars ($201,666.00) in the aggregate (collectively, "**Chesapeake Space Abated Rent**"); provided, further, that in the event of a Default by Tenant at any time prior to August 31, 2032 (the "**Chesapeake Outside Month**"), a fraction of all previously abated Chesapeake Space Abated Rent under this Amendment, the numerator of which shall be the number of months remaining from and including the month in which such Default occurs until and including the Chesapeake Outside Month, and the denominator of which shall be the number of months from and including the month in which the Chesapeake Fifth Extension Date occurs until and including the Chesapeake Outside Month, shall be immediately due and payable in full at that time without the necessity of further notice or action by Landlord (provided, however, that such fraction of the Chesapeake Space Abated Rent shall not be immediately due and payable with respect to the first Default in any twelve (12) month period unless such Default continues beyond three (3) business days after written notice thereof).

SECTION 4. MONTHLY BASE RENT FOR PENOBSCOT SECOND EXTENDED TERM.
Notwithstanding any provision of the Existing Lease to the contrary, commencing on the Penobscot Second Extension Date and continuing through the Penobscot Extended Expiration Date, the amount of Monthly Base Rent payable by Tenant for the Penobscot Space shall be as follows:

Period from/to	Monthly Base Rent
June 1, 2027 – May 31, 2028	$379,960.00*
June 1, 2028 – May 31, 2029	$391,358.80
June 1, 2029 – May 31, 2030	$403,099.56
June 1, 2030 – May 31, 2031	$415,192.55
June 1, 2031 – May 31, 2032	$427,648.33
June 1, 2032 – August 31, 2032	$440,477.78

*Notwithstanding anything in the foregoing to the contrary, provided that a Default by Tenant (other than the first Default in any twelve (12) month period unless such Default continues beyond three (3) business days after written notice thereof) has not previously occurred, Landlord agrees to forbear in the collection of and abate the Monthly Base Rent solely for the Penobscot Space due and payable for the period beginning on June 1, 2027 and continuing through August 31, 2027, totaling not more than One Million One Hundred Thirty-Nine Thousand Eight Hundred Eighty and 00/100 Dollars ($1,139,880.00) in the aggregate (collectively, "**Penobscot Space Abated Rent**"); provided, further, that in the event of a Default by Tenant at any time prior to August 31, 2032 (the "**Penobscot Outside Month**"), a fraction of all previously abated Penobscot Space Abated Rent under this Amendment, the numerator of which shall be the number of months remaining from and including the month in which such Default occurs until and including the Penobscot Outside Month, and the denominator of which shall be the number of months from and including the month in which the Penobscot Second Extension Date occurs until and including the Penobscot Outside Month, shall be immediately due and payable in full at that time without the necessity of further notice or action by Landlord (provided, however, that such fraction of the Penobscot Space Abated Rent shall not be immediately due and payable with respect to the first Default in any twelve (12) month period unless such Default continues beyond three (3) business days after written notice thereof).

SECTION 5. LETTER OF CREDIT. Landlord and Tenant acknowledge and agree that Tenant has provided Landlord with a Letter of Credit in the amount of One Million Sixty-One Thousand Five Hundred Seventy-Two and 62/100 Dollars ($1,061,572.62) pursuant to Section 5.02 of the Original Lease, as amended by Section 4 of the Second Amendment, Section 5 of the Third Amendment, Section 9 of the Fifth Amendment and Section 5 of the Eighth Amendment. Tenant acknowledges its obligation to maintain the Letter of Credit throughout the Term. Accordingly, the LOC Expiration Date (as defined in the Lease) shall mean the date that is forty-five (45) days following the Extended Expiration Date (as the same may be further extended). If the Option to Extend is exercised with respect to a portion but not all of the Premises, then so long as there has been no material adverse change in Tenant's financial position from such position as of the date of execution of the Lease, as certified by Tenant's independent certified public accountants, and as supported by Tenant's certified financial statements, copies of which shall be delivered to Landlord with Tenant's written notice exercising the Option to Extend, then the portion of the Letter of Credit required to be maintained from and after the Extended Expiration Date shall be limited to a prorata portion of the Letter of Credit amount applicable to the rentable square footage of the Premises that is subject to the extension. Notwithstanding the foregoing or anything to the contrary contained in the Lease, in the event that at any time the financial institution which issued the Letter of Credit held by Landlord is declared insolvent by the FDIC or is closed for any reason, Tenant shall within a reasonable period not to exceed fifteen (15) days provide a substitute Letter of Credit that satisfies the requirements of the Lease as amended hereby from a financial institution reasonably acceptable to Landlord.

SECTION 6. TENANT'S SHARE. During the Chesapeake Fifth Extended Term and the Penobscot Second Extended Term, Tenant shall pay all Rent Adjustments, including Tenant's Share of Operating Expenses. Notwithstanding any provisions of the Existing Lease to the contrary, during the Chesapeake Fifth Extended Term and the Penobscot Second Extended Term, Tenant's Share is as follows:

(a) Chesapeake Space: 3.65% of Phase I and 2.05% of the Project.

(b) 200 Penobscot Space and 220 Penobscot Space (combined): 9.35% of Phase I and 5.25% of the Project.

(c) 400 Penobscot Space: 12.54% of Phase I and 7.04% of the Project.

SECTION 7. "AS IS" CONDITION.

(a) Notwithstanding any provision of the Existing Lease to the contrary, Tenant hereby leases and accepts the Chesapeake Space for the Chesapeake Fifth Extended Term and the Penobscot Space for the Penobscot Second Extended Term in its "AS IS" condition existing on the Effective Date, without any express or implied representations or warranties of any kind by Landlord, its brokers, manager or agents, or the employees of any of them regarding the Premises; and Landlord shall not have any obligation to construct or install any tenant improvements or alterations or to pay for any such construction or installation, except as expressly set forth in the Workletter (defined below) and except for Landlord's continuing obligations under the Lease.

(b) Tenant shall have the right to perform the work and make the installations in Chesapeake Space and the Penobscot Space as set forth in the Workletter set forth in Exhibit A hereto (the "**Workletter**") (such work may be referred to as "**Tenant Alterations**").

SECTION 8. ASSIGNMENT AND SUBLETTING.

(a) The penultimate sentence of Section 10.01(a) of the Original Lease is hereby deleted.

(b) Section 10.02 of the of the Original Lease is amended so that Landlord's right to recapture shall not apply if Tenant proposes to sublease less than all of the square footage of the Rentable Area contained in the Chesapeake Space and the Penobscot Space collectively.

SECTION 9. OFFER RIGHT. The Offer Right set forth in Section 9 of the Eighth Amendment is hereby deleted in its entirety and replaced with the following:

(a) Landlord hereby grants Tenant a right to lease the Offer Spaces (defined below) if and to the extent such space is Available (defined below) during the period beginning on the date of execution of this Amendment and expiring [***] months [***] (the "**Offer Period**"), upon and subject to the terms and conditions of this Section (the "**Offer Right**"), and provided that at the time of exercise of such right: (i) Tenant must be conducting regular, active, ongoing business in, and be in occupancy (and occupancy by a subtenant, licensee or other party permitted or suffered by Tenant shall not satisfy such condition) of at least seventy percent (70%) of the square footage of the Rentable Area of the Premises at the time of exercise of such right; and (ii) there has been no material adverse change in Tenant's financial position from such position as of the Effective Date, as certified by Tenant's chief financial officer, and as supported by Tenant's certified financial statements, copies of which shall be delivered to Landlord with Tenant's written notice exercising its right hereunder, and to Landlord's reasonable satisfaction. Without limiting the generality of the foregoing, Landlord may reasonably conclude there has been a material adverse change if Tenant's chief financial officer does not certify there has been no such change. Notwithstanding the foregoing, so long as Tenant is a publicly traded company on an "over-the-counter" market or any recognized national or international securities exchange, Tenant shall not be required to provide certified financial statements by its chief financial officer (and shall not be required to provide a certification by its chief financial officer that there has been no material adverse change in Tenant's financial position) so long as Tenant's current public annual report (in compliance with applicable securities laws) for such applicable year is available to Landlord in the public domain.

(b) "**Offer Spaces**" shall mean the leasable space consisting of approximately (i) 15,[***] rentable square feet and referred to as [***], and (ii) 11, [***] rentable square feet and referred to as [***] (each individually referred to as an "**Offer Space**")**.** The term "**Available**" shall mean that the space in question is either: (1) vacant and free and clear of the tenant in the Offer Space as of the Effective Date, [***] (the "**Current Tenant**"); or (2) space as to which Landlord has received a proposal, or Landlord is making a proposal, for a lease or rights of any nature applicable in the future when such space would be free and clear of the applicable Current Tenant. The parties acknowledge and agree that Landlord shall be free at any time during the term of the lease with the Current Tenant to enter into an extension or renewal of the term for the applicable Offer Space with the Current Tenant.

(c) Nothing herein shall be deemed to limit or prevent Landlord from marketing, discussing or negotiating with any other party for a lease of, or rights of any nature as to, any part of the Offer Space, but during the Offer Period before Landlord makes any written proposal to any other party (other than the Current Tenant) for any Offer Space which becomes Available (including giving a written response to any proposal or offer received from another party), or contemporaneously with making any such proposal, and in any event within thirty (30) days after such space becomes vacant and free and clear of the applicable Current Tenant, Landlord shall give Tenant written notice (**"Landlord's Notice"**), which notice identifies the space Available, its rentable area, Landlord's estimate of the projected date such space will be vacant and deliverable to Tenant, Landlord's estimate of the applicable Fair Market Rental Rate, as defined in Exhibit B hereto ("**Landlord's Estimate**"), and if applicable, base year or base amount (if different from that for the rest of the Premises) with respect to Operating Expenses. For the period of ten (10) days after Landlord gives Landlord's Notice (the "**Election Notice Period**"), Tenant shall have the right to give Landlord irrevocable written notice ("**Election Notice**") of Tenant's election to lease all (and not less than all) the Offer Space identified in Landlord's Notice.

(d) In the event Tenant duly and timely delivers its Election Notice to Landlord, such exercise shall thereby create and constitute a binding lease of the Offer Space by and to Tenant, subject to suspension or termination of such right pursuant to Subsection (h) below, upon and subject to the same terms and conditions contained in the Lease except as follows: (i) Tenant shall accept the Offer Space in its then "AS IS" condition, but broom clean and free of all tenants or occupants, without any obligation of Landlord to repaint, remodel, improve or alter such space for Tenant's occupancy or to provide Tenant any allowance therefor except to the extent tenants leasing space in Comparable Transactions receive an allowance pursuant to the definition of Fair Market Rental Rate, provided, however, Landlord, by notice given to Tenant within thirty (30) days after receipt of Tenant's Election Notice, may elect to provide, in lieu of such allowance for alterations to the Offer Space, a rent credit equal to the amount of the allowance that would have otherwise been given, credited toward the rents applicable only to the Offer Space and due starting after such rent obligation commences; (ii) Landlord shall deliver the Offer Space to Tenant no later than thirty (30) days after the later of the date on which Landlord regains possession of such space or the date on which Landlord receives Tenant's Election Notice; (iii) upon such delivery, the Offer Space shall be part of the Premises under the Lease, such that the term "Premises" in the Lease thereafter shall mean both the space leased immediately prior to such delivery and the Offer Space, and shall be leased for the remaining Penobscot Second Extended Term (subject to a separate option to extend the Term of the Lease with respect to the Offer Space for an additional term of five (5) years (which option to extend shall be under the same terms and conditions of Section 12(b) of the Fifth Amendment); (iv) starting on such delivery date, with respect to the Offer Space Tenant shall pay Monthly Base Rent equal to the Fair Market Rental Rate, with Fair Market Rental Rate defined and determined as set forth herein and in Exhibit B; (v) starting on such delivery date, with respect to the Offer Space Tenant shall additionally pay Tenant's Share of Operating Expenses or increases in Operating Expenses, as applicable under the Lease, with Tenant's Share recalculated to reflect addition of the Offer Space; (vi) starting on such delivery date, Tenant shall additionally pay other charges payable by Tenant for utilities and otherwise with respect to the Offer Space; and (vii) the Letter of Credit shall be increased to an amount that is the same percentage or proportion of Rent (after including Rent for the Offer Space) as the prior amount of Letter of Credit was in relation to prior Rent.

(e) Landlord's Estimate set forth in Landlord's Notice shall be conclusive and binding as the Monthly Base Rent payable for the Offer Space in Landlord's Notice unless Tenant notifies Landlord in Tenant's Election Notice that Tenant elects to lease the subject Offer Space but disputes Landlord's Estimate and specifies in detail the reasons therefor and states Tenant's good faith estimate of the Fair Market Rental Rate. If the dispute is not resolved within ten (10) business days after Landlord receives Tenant's Election Notice as described above, then the Fair Market Rental Rate shall be determined in accordance with the terms of Exhibit B.

(f) Promptly after final determination of the Fair Market Rental Rate, Landlord shall prepare a memorandum confirming the specific dates, amounts and terms of the lease of the subject Offer Space in accordance with the terms and conditions of this Offer Right, in the form of an amendment to the Lease. Tenant shall execute such amendment within ten (10) business days after receipt of the proposed amendment and Landlord shall execute it promptly days after Landlord's receipt from Tenant. Notwithstanding any of the foregoing to the contrary, the failure of Landlord to prepare such amendment or of either party to execute an amendment shall not affect the validity and effectiveness of the lease of the Offer Space in accordance with the terms and conditions of this Offer Right.

(g) If Tenant either fails or elects not to exercise its Offer Right as to the Offer Space covered by Landlord's Notice by not giving its Election Notice within the Election Notice Period, then Tenant's Offer Right shall not apply for twelve (12) months thereafter with respect to the space covered by Landlord's Notice and Landlord shall be free to lease such space and/or otherwise grant options or rights to such space on any terms and conditions whatsoever free and clear of the Offer Right, and if upon expiration of such twelve (12) month period Landlord has not executed any lease or written agreement with respect to the applicable Offer Space, the procedure set forth above shall be repeated. Further, if Landlord executes with any third party or parties any new leases or written agreements permissible under this Section for any Offer Space covered by Landlord's Notice, the determination of whether or not such space again becomes Available so as again to be subject to Tenant's rights hereunder shall be made by applying the standards set forth above in Subsection (b) as to such new leases or written agreements in the same manner as if they had been entered into prior to the Offer Period.

(h) During any period that Tenant does not occupy at least [***] ([***]%) of the square footage of Rentable Area in the Premises at the time of exercise of such right or that there is an uncured Default by Tenant under the Lease, or any state of facts which with the passage of time or the giving of notice, or both, would constitute such a Default, the Offer Right shall not apply and shall be ineffective and suspended, and Landlord shall not be obligated to give a Landlord's Notice as to any space which becomes Available during such suspension period, and Landlord shall not be obligated to negotiate (or enter any amendment) with respect to any Offer Space which was the subject of a pending Landlord's Notice for which an amendment has not been fully executed, and during such suspension period Landlord shall be free to lease and/or otherwise grant options or rights to such space on any terms and conditions whatsoever free and clear of the Offer Right. The Offer Right shall terminate upon any of the following: (1) the termination of the Lease upon the occurrence of a Tenant default or otherwise; (2) Landlord's recovery of possession of the Premises upon the occurrence of a Tenant default or otherwise; (3) rejection of the Lease in any bankruptcy proceeding.

(i) The Offer Right is personal to Codexis, Inc., a Delaware corporation, and may not be used by, and shall not be transferable or assignable (voluntarily or involuntarily) to any person or entity other than an Affiliate (as defined in Section 10.01 of the Original Lease) which is an assignee of the Lease and which has satisfied the requirements of Sections 10.01 and 10.05 of the Original Lease.

SECTION 10. USE OF HAZARDOUS MATERIALS. Exhibit D to the Original Lease is hereby replaced with the new Exhibit D attached to this Amendment. The parties agree that (a) prior to adding any types or increasing any quantities of Hazardous Materials used or handled in the Premises, and (b) in any event (regardless of whether Tenant has added any types or increased any quantities of Hazardous Materials used or handled in the Premises), at least once per year, Tenant will provide updates, if any, to the

information provided on such Exhibit D related to Tenant's Hazardous Material Business Plan (including chemicals of any volume listed on 40 CFR Appendix A to Part 355) in writing to Landlord or Landlord's property manager for Landlord's review and reasonable approval, and Landlord's approval in writing to Tenant will suffice as an update to such Exhibit D for purposes of the Lease.

SECTION 11. LIMITATION OF LANDLORD'S LIABILITY. Notwithstanding any provision of the Existing Lease to the contrary (including, without limitation, Section 26.08 of the Original Lease), Tenant agrees, on its behalf and on behalf of its successors and assigns, that any liability or obligation of Landlord in connection with the Existing Lease shall only be enforced against Landlord's equity interests in the Project up to a maximum of Five Million Dollars ($5,000,000.00) and in no event against any other assets of the Landlord, or Landlord's officers or directors or partners, and that any liability of Landlord with respect to the Lease shall be so limited and Tenant shall not be entitled to any judgment in excess of such amount.

SECTION 12. TIME OF ESSENCE. Without limiting the generality of any other provision of the Existing Lease, time is of the essence to each and every term and condition of this Amendment.

SECTION 13. BROKERS. Notwithstanding any other provision of the Existing Lease to the contrary, Tenant represents that in connection with this Amendment it has not dealt with any real estate broker, sales person, or finder in connection with this Amendment, and no such person initiated or participated in the negotiation of this Amendment, except for CBRE, Inc. ("**Landlord's Broker**"). Tenant hereby indemnifies and agrees to protect, defend and hold Landlord and Landlord's Broker harmless from and against all claims, losses, damages, liability, costs and expenses (including, without limitation, attorneys' fees and expenses) by virtue of any broker, agent or other person claiming a commission or other form of compensation by virtue of alleged representation of, or dealings or discussions with, Tenant with respect to the subject matter of this Amendment, except for Landlord's Broker. Tenant is not obligated to pay or fund any amount to Landlord's Broker, and Landlord hereby agrees to pay such commission, if any, to which Landlord's Broker is entitled in connection with the subject matter of this Amendment pursuant to Landlord's separate written agreement with Landlord's Broker. The provisions of this Section shall survive the expiration or earlier termination of the Lease.

SECTION 14. ATTORNEYS' FEES. Each party to this Amendment shall bear its own attorneys' fees and costs incurred in connection with the discussions preceding, negotiations for and documentation of this Amendment. Tenant shall be liable for, and shall pay upon demand, all costs and expenses, including reasonable attorneys' fees, incurred by Landlord in enforcing Tenant's performance of its obligations under this Lease, or resulting from a Default by Tenant (regardless of whether suit is initiated), or incurred by Landlord in any litigation, negotiation or transaction in which Tenant causes Landlord, without Landlord's fault, to become involved or concerned (including in any action or participation in or in connection with any case or proceeding under the Bankruptcy Code, 11 United States Code Sections 101 et seq., or any successor statutes, in establishing or enforcing the right to indemnification, in appellate proceedings, or in connection with the enforcement or collection of any judgment obtained in any such suit or proceeding).

SECTION 15. EFFECT OF HEADINGS; RECITALS: EXHIBITS. The titles or headings of the various parts or sections hereof are intended solely for convenience and are not intended and shall not be deemed to or in any way be used to modify, explain or place any construction upon any of the provisions of this Amendment. Any and all Recitals set forth at the beginning of this Amendment are true and correct and constitute a part of this Amendment as if they had been set forth as covenants herein. Exhibits, schedules, plats and riders hereto which are referred to herein are a part of this Amendment.

SECTION 16. ENTIRE AGREEMENT; AMENDMENT. This Amendment taken together with the Existing Lease, together with all exhibits, schedules, riders and addenda to each, constitutes the full and complete agreement and understanding between the parties hereto and shall supersede all prior communications, representations, understandings or agreements, if any, whether oral or written, concerning the subject

matter contained in this Amendment and the Existing Lease, as so amended, and no provision of the Lease

as so amended may be modified, amended, waived or discharged, in whole or in part, except by a written instrument executed by all of the parties hereto.

SECTION 17. SANCTIONS LIST.

(a) Tenant hereby represents, warrants and covenants to Landlord that either:

(i) Tenant is a Regulated Entity (as defined below), or

(ii) neither Tenant nor any person or entity that directly or indirectly has an ownership interest in Tenant of twenty-five percent (25%) or more, is or will be (A)(1) subject to a U.S. comprehensive sanctions program administered by the U.S. Department of Treasury, Office of Foreign Assets Control ("**OFAC**"), (2) named on OFAC's U.S. Specially Designated Nationals list, or (3) named on OFAC's Sectoral Sanctions Identifications list ((1), (2) and (3) collectively the "**OFAC Sanctions Lists**"),
(B) named on any other locally required sanctions lists ("**Country Lists**"), or (C) named on the United Nations Security Council's sanctions list (the "U.N. List" and together with the OFAC Sanctions Lists and the Country Lists, the "**Sanctions Lists**").

(b) If, in connection with the Lease, there is one or more Guarantors of Tenant's obligations under the Lease, then Tenant further represents, warrants and covenants that either:

(i) any such Guarantor is a Regulated Entity,

(ii) neither Guarantor nor any person or entity that directly or indirectly has an ownership interest in such Guarantor of twenty-five percent (25%) or more is or will be on the Sanctions Lists.

For purposes of this Section, a "**Regulated Entity**" shall mean a U.S. public company (including their documented wholly-owned subsidiaries) or any other entity, including a bank, that is regulated by the SEC, FINRA, or Federal Reserve.

SECTION 18. RATIFICATION. Tenant represents to Landlord that: (a) the Existing Lease is in full force and effect and has not been modified except as provided by this Amendment; (b) to Tenant's knowledge, as of the Effective Date, there are no uncured defaults or unfulfilled obligations on the part of Landlord or Tenant; and (c) Tenant is currently in possession of the entire Premises as of the Effective Date, and neither the Premises, nor any part thereof, is occupied by any subtenant or other party other than Tenant (except for any subleases that have been consented to by Landlord in writing).

SECTION 19. AUTHORITY. Each party represents and warrants to the other that it has full authority and power to enter into and perform its obligations under this Amendment, that the person executing this Amendment is fully empowered to do so, and that no consent or authorization is necessary from any third party. Landlord may request that Tenant provide Landlord evidence of Tenant's authority.

SECTION 20. DISCLOSURE REGARDING CERTIFIED ACCESS SPECIALIST. Pursuant to California
Civil Code Section 1938, Landlord hereby notifies Tenant that as of the date of this Amendment, the Premises have not undergone inspection by a "Certified Access Specialist" ("**CASp**") to determine whether the Premises meet all applicable construction-related accessibility standards under California Civil Code Section 55.53. Landlord hereby discloses pursuant to California Civil Code Section 1938 as follows: "A Certified Access Specialist (CASp) can inspect the subject premises and determine whether the subject premises comply with all of the applicable construction-related accessibility standards under state law. Although state law does not require a CASp inspection of the subject premises, the commercial property owner or lessor may not prohibit the lessee or tenant from obtaining a CASp inspection of the

subject premises for the occupancy or potential occupancy of the lessee or tenant, if requested by the lessee or

tenant. The parties shall mutually agree on the arrangements for the time and manner of the CASp inspection, the payment of the fee for the CASp inspection, and the cost of making any repairs necessary to correct violations of construction-related accessibility standards within the premises." Landlord and Tenant hereby acknowledge and agree that in the event that Tenant elects to perform a CASp inspection of the Premises hereunder (the "**Inspection**"), such Inspection shall be (a) performed at Tenant's sole cost and expense, (b) limited to the Premises and (c) performed by a CASp who has been approved or designated by Landlord prior to the Inspection. Any Inspection must be performed in a manner which minimizes the disruption of business activities in the Building, and at a time reasonably approved by Landlord. Landlord reserves the right to be present during the Inspection. Tenant agrees to: (i) promptly provide to Landlord a copy of the report or certification prepared by the CASp inspector upon request (the "**Report**"), and
(ii) keep the information contained in the Report confidential, except to the extent required by Law, or to the extent disclosure is needed in order to complete any necessary modifications or improvements required to comply with all applicable accessibility standards under state or federal Law, as well as any other repairs, upgrades, improvements, modifications or alterations required by the Report or that may be otherwise required to comply with applicable Laws or accessibility requirements (the "**Access Improvements**"). Tenant shall be solely responsible for the cost of Access Improvements to the Premises or the Building necessary to correct any such violations of construction-related accessibility standards identified by such Inspection as required by Law, which Access Improvements may, at Landlord's option, be performed in whole or in part by Landlord at Tenant's expense, payable as additional rent within ten (10) days following Landlord's demand.

SECTION 21. ENERGY UTILITY USAGE. If Tenant is billed directly by a public utility with respect to Tenant's energy usage at the Premises, then, upon written request, Tenant shall provide monthly energy utility usage for the Premises to Landlord for the period of time requested by Landlord (in electronic or paper format) or, at Landlord's option, provide any written authorization or other documentation required for Landlord to request information regarding Tenant's energy usage with respect to the Premises directly from the applicable utility company.

SECTION 22. EXISTING TENANT ADDITIONS. Tenant shall not be required to remove any Tenant Additions existing in the Chesapeake Space or the Penobscot Space as of the Effective Date except for any Tenant Additions containing Hazardous Materials, Tenant's trade fixtures, personal property and cabling and wiring installed for any of the foregoing.

SECTION 23. COUNTERPARTS. This Amendment may be executed in duplicates or counterparts, or both, and such duplicates or counterparts together shall constitute but one original of the Amendment, and the signature of any party to any counterpart shall be deemed a signature to, and may be appended to, any other counterpart. Each duplicate and counterpart shall be equally admissible in evidence, and each original shall fully bind each party who has executed it.

[Signature Page Follows]

IN WITNESS WHEREOF, the parties hereto have executed this Amendment as of the latest date set forth below.

TENANT: **CODEXIS, INC.,**
a Delaware corporation

By: /s/ Kevin Norrett

Print Name: Kevin Norrett

Title: Chief Operating Officer
(Chairman of Board, President or Vice President)

Date: November 20, 2024

By: /s/ Georgia Erbez

Print Name: Georgia Erbez

Title: Chief Financial Officer
(Secretary, Assistant Secretary, CFO or Assistant Treasurer) Date: November 12, 2024

LANDLORD: **METROPOLITAN LIFE INSURANCE COMPANY**,
a New York corporation

By: MetLife Investment Advisors, LLC, a Delaware limited liability company, its investment manager

By: /s/ Michael Pace

Print Name: Michael Pace

Title: Authorized Signatory and Managing Director

Date: December 2, 2024

EXHIBIT A

WORKLETTER AGREEMENT (TENANT BUILD - ALLOWANCE)

This Workletter Agreement ("**Workletter**") is attached to and a part of a certain Amendment by and between METROPOLITAN LIFE INSURANCE COMPANY, a New York corporation, as Landlord, and CODEXIS, INC., a Delaware corporation, as Tenant, for the Premises. Terms used herein and not defined herein shall have the meaning of such terms as defined elsewhere in the Lease. For purposes of this Workletter, references to "State" and "City" shall mean the State and City in which the Building is located.

1. Landlord Work.

There shall be no Landlord Work.

2. Tenant's Plans.

2.1. Description. At its expense, Tenant shall employ:

(i) one or more architects reasonably satisfactory to Landlord and licensed by the State ("**Tenant's Architect**") to prepare architectural drawings and specifications for all layout and Premises improvements not included in, or requiring any change or addition to, the AS IS condition and Landlord Work, if any. Landlord hereby approves of [***] as a permitted "Tenant's Architect".

(ii) one or more engineers reasonably satisfactory to Landlord and licensed by the State ("**Tenant's Engineers**") to prepare structural, mechanical and electrical working drawings and specifications for all Premises improvements not included in, or requiring any change or addition to, the AS IS condition and Landlord Work, if any.

All such drawings and specifications are referred to herein as "**Tenant's Plans**". Tenant's Plans shall be in form and detail sufficient to secure all applicable governmental approvals. Tenant's Architect shall be responsible for coordination of all engineering work for Tenant's Plans and shall coordinate with any consultants retained by Tenant in connection with the design and installation of improvements to the Premises (the use of such consultants is subject to Landlord's consent), and Landlord's architect or other representative to assure the consistency of Tenant's Plans with the Base Building Work and Landlord Work (if any).

Tenant shall pay Landlord, within thirty (30) days of receipt of each invoice from Landlord, the cost incurred by Landlord for Landlord's architects and engineers to review Tenant's Plans for consistency of same with the Base Building Work and Landlord Work, if any. Tenant's Plans shall also include the following:

(a) Final Space Plan: The "**Final Space Plan**" for the Premises shall include a full and accurate description of room titles, floor loads, alterations to the Base Building or Landlord Work (if any) or requiring any change or addition to the AS IS condition, and the dimensions and location of all partitions, doors, aisles, plumbing (and furniture and equipment to the extent same affect floor loading) and include a drop ceiling for the entire Premises and HVAC distributed throughout the entire Premises except the shipping and warehouse areas. The Final Space Plan shall (i) be compatible with the design, construction, systems and equipment of the Base Building and Landlord Work, if any; (ii) specify only materials, equipment and installations which are new and of a grade and quality no less than existing components of the Building when they were originally installed (collectively, (i) and (ii) may be referred to as "**Building Standard**" or "**Building Standards**");

(iii) comply with Laws, (iv) be capable of logical measurement and construction, and (v) contain all such information as may be required for the preparation of the Mechanical and Electrical Working

Drawings and Specifications (including, without limitation, a capacity and usage report, from engineers designated by Landlord pursuant to Section 2.1(b). below, for all mechanical and electrical systems in the Premises).

(b) Mechanical and Electrical Working Drawings and Specifications: Tenant shall employ engineers reasonably satisfactory to Landlord to prepare Mechanical and Electrical Working Drawings and Specifications showing complete plans for electrical, life safety, automation, plumbing, water, and air cooling, ventilating, heating and temperature control and shall employ engineers designated by Landlord to prepare for Landlord a capacity and usage report ("**Capacity Report**") for all mechanical and electrical systems in the Premises.

(c) Issued for Construction Documents: The "**Issued for Construction Documents**" shall consist of all drawings (1/8" scale) and specifications necessary to construct all Premises improvements including, without limitation, architectural and structural working drawings and specifications and Mechanical and Electrical Working Drawings and Specifications and all applicable governmental authorities plan check corrections.

2.2. Approval by Landlord. Tenant's Plans and any revisions thereof shall be subject to Landlord's approval, which approval or disapproval:

(i) shall not be unreasonably withheld, provided however, that Landlord may disapprove Tenant's Plans in its sole and absolute discretion if they (a) adversely affect the structural integrity of the Building, including applicable floor loading capacity; (b) adversely affect any of the Building Systems (as defined below), the Common Areas or any other tenant space (whether or not currently occupied); (c) fail to fully comply with Laws, (d) adversely affect the exterior appearance of the Building; (e) provide for improvements which do not meet or exceed the Building Standards; or (f) involve any installation on the roof (except with respect to HVAC installation on the roof), or otherwise affect the roof, roof membrane or any warranties regarding either. Building Systems collectively shall mean the structural, electrical, mechanical (including, without limitation, heating, ventilating and air conditioning), plumbing, fire and life-safety (including, without limitation, fire protection system and any fire alarm), communication, utility, gas (if any), and security (if any) systems in the Building.

(ii) shall not be delayed beyond ten (10) business days with respect to initial submissions and major change orders (those which impact Building Systems or any other item listed in subpart
(i) of Section 2.2 above) and beyond five (5) business days with respect to required revisions and any other change orders.

If Landlord disapproves of any of Tenant's Plans, Landlord shall advise Tenant of what Landlord disapproves in reasonable detail. After being so advised by Landlord, Tenant shall submit a redesign, incorporating the revisions required by Landlord, for Landlord's approval. The approval procedure shall be repeated as necessary until Tenant's Plans are ultimately approved. Approval by Landlord shall not be deemed to be a representation or warranty by Landlord with respect to the safety, adequacy, correctness, efficiency or compliance with Laws of Tenant's Plans. Tenant shall be fully and solely responsible for the safety, adequacy, correctness and efficiency of Tenant's Plans and for the compliance of Tenant's Plans with any and all Laws.

2.3. Landlord Cooperation. Landlord shall cooperate with Tenant and make good faith efforts to coordinate Landlord's construction review procedures to expedite the planning, commencement, progress and completion of Tenant Alterations. Landlord shall complete its review of each stage of Tenant's Plans and any revisions thereof and communicate the results of such review within the time periods set forth in Section 2.2 above.

2.4. City Requirements. Any changes in Tenant's Plans which are made in response to requirements of the applicable governmental authorities and/or changes which affect the Base Building Work shall be immediately submitted to Landlord for Landlord's review and approval.

2.5. "As Built" Drawings and Specifications. A CADD-DXF diskette file and a set of black line drawings of all "as built" drawings and specifications of Tenant's Work in the Premises (reflecting all field changes and including, without limitation, architectural, structural, mechanical and electrical drawings and specifications) prepared by Tenant's Architect and Engineers or by Contractors (defined below) shall be delivered by Tenant at Tenant's expense to the Landlord within thirty (30) days after completion of the Tenant Alterations. If Landlord has not received such drawings and diskette(s) within thirty (30) days, Landlord may give Tenant written notice of such failure. If Tenant does not produce the drawings and diskette(s) within ten (10) days after Landlord's written notice, Landlord may, at Tenant's sole cost which may be deducted from the Allowance, produce the drawings and diskette(s) using Landlord's personnel, managers, and outside consultants and contractors. Landlord shall receive an hourly rate reasonable for such production.

3. Tenant Alterations.

3.1. Tenant Alterations Defined. All tenant improvement work required by the Issued for Construction Documents (including, without limitation, any approved changes, additions or alterations pursuant to Section 6 below) is referred to in this Workletter as "**Tenant Alterations**."

3.2. Tenant to Construct. Tenant shall construct all Tenant Alterations pursuant to this Workletter, and except to the extent modified by or inconsistent with express provisions of this Workletter, pursuant with the provisions of the terms and conditions of Article Nine of the Lease, governing Tenant Alterations (except to the extent modified by this Workletter) and all such Tenant Alterations shall be considered "**Tenant Alterations**" for purposes of the Lease.

3.3. Construction Contract. All contracts and subcontracts for Tenant Alterations shall include any terms and conditions reasonably required by Landlord.

3.4. Contractor. Tenant shall select one or more contractors to perform the Tenant Alterations ("**Contractor**") subject to Landlord's prior written approval, which shall not unreasonably be withheld.

3.5. Division of Landlord Work and Tenant Alterations. Tenant Alterations is defined in Section 3.1 above and Landlord Work, if any, is defined in Section 1.

3.6. Restoration. Notwithstanding anything to the contrary in the Existing Lease or in this Workletter, (a) if so requested by Tenant in writing (and prominently in all capital and bold lettering which also states that such request is pursuant to Section 3.6 at the time Tenant requests approval of any Tenant Alterations, Landlord shall advise Tenant at the time of Landlord's approval of such Tenant Alterations as to whether Landlord will require that such Tenant Alterations be removed by Tenant from the Premises; provided, however, regardless of the foregoing, in any event, Landlord may require removal of any Tenant Alterations containing Hazardous Material and all Tenant's trade fixtures, and, subject to Section 6.03 of the Original Lease, cabling and wiring installed for Tenant's personal property or trade fixtures, and (b) except for such Tenant Alterations containing Hazardous Material, Tenant's trade fixtures, and such cabling and wiring, Landlord shall not require removal of any improvements that are in the nature of general office or lab improvements.

4. Tenant's Expense.

Tenant agrees to pay for all Tenant Alterations, including, without limitation, the costs of design thereof, whether or not all such costs are included in the "Permanent Improvement Costs" (defined below). Subject to the terms and conditions of this Workletter, Landlord shall provide an "**Allowance**" towards the cost of design and construction of the Tenant Alterations (including, without limitation, the installation of an emergency generator if Tenant elects, at Tenant's sole discretion, to install the same) as follows:

(a) Forty-Two and 00/100 Dollars ($42.00) per square foot of Rentable Area of the Penobscot Space (i.e., $2,775,360.00); provided, however, Tenant must spend not less than Twenty-One and 00/100 ($21.00) per square foot of Rentable Area of the Penobscot Space for Permanent Improvements in the Penobscot Space (i.e., $1,387,680.00), and thereafter Tenant may use the remainder of such Allowance for Permanent Improvements in any portion of the Penobscot Space or the Chesapeake Space; and

(b) Twenty-Five and 00/100 Dollars ($25.00) per square foot of Rentable Area of the Chesapeake Space (i.e., $275,500.00); provided, however, Tenant must spend not less than Twelve and 50/100 ($12.50) per square foot of Rentable Area of the Chesapeake Space for Permanent Improvements in the Chesapeake Space (i.e., $137,750.00), and thereafter Tenant may use the remainder of such Allowance for Permanent Improvements in any portion of the Penobscot Space or the Chesapeake Space.

The term "**Permanent Improvement Costs**" shall mean the actual and reasonable costs of construction of that Tenant Alterations which constitutes permanent improvements to the Premises, actual and reasonable costs of design and management thereof and governmental permits therefor, and costs incurred by Landlord for Landlord's architects and engineers pursuant to Section 2.1, and Landlord's construction administration fee (defined in Section 7.10 below). Permanent Improvement Costs shall exclude costs of "Tenant's FF&E" (defined below) and shall include an emergency generator as provided above if Tenant elects to install the same For purposes of this Workletter, "**Tenant's FF&E**" shall mean Tenant's furniture, furnishings, telephone systems, computer systems, equipment, any other personal property or fixtures, and installation thereof. If Tenant does not utilize one hundred percent (100%) of the Allowance for Permanent Improvement Costs no later than the date that is thirty (30) months following the Effective Date and submit full and complete application(s) for disbursement thereof pursuant to Section 5 below, Tenant shall have no right to the unused portion of the Allowance.

5. Application and Disbursement of the Allowance.

5.1. Tenant shall prepare a budget for all Tenant Alterations, including the Permanent Improvement Costs and all other costs of the Tenant Alterations ("**Budget**"), which Budget shall be subject to the reasonable approval of Landlord and may be reasonably updated by Tenant from time to time. Such Budget shall be supported by such other documentation as Landlord may require to evidence the total costs. To the extent the Budget exceeds the available Allowance ("**Excess Cost**"), Tenant shall be solely responsible for payment of such Excess Cost (subject to any remaining Allowance). Further, prior to any disbursement of the Allowance by Landlord, Tenant shall pay and disburse its own funds for all that portion of the Permanent Improvement Costs equal to the sum of (a) the Permanent Improvement Costs in excess of the Allowance; plus (b) the amount of "Landlord's Retention" (defined below). "**Landlord's Retention**" shall mean an amount equal to ten percent (10%) of the Allowance, which Landlord shall retain out of the Allowance and shall not be obligated to disburse unless and until after Tenant has completed the Tenant Alterations and complied with Section 5.4 below. Further, Landlord shall not be obligated to make any disbursement of the Allowance unless and until Tenant has provided Landlord with (i) bills and invoices covering all labor and material expended and used in connection with the particular portion of the Tenant Alterations for which Tenant has requested reimbursement, (ii) an affidavit from Tenant stating that all of such bills and invoices have either been paid in full by Tenant or are due and owing, and all such costs qualify as Permanent Improvement Costs, (iii) contractors affidavit covering all labor and materials expended and used, (iv) Tenant, contractors and architectural completion affidavits (as applicable), and (v) valid mechanics' lien releases and waivers pertaining to any completed portion of the Tenant Alterations which shall be conditional or unconditional, as applicable, all as provided pursuant to Section 5.2 and 5.4 below.

5.2. Upon Tenant's full compliance with the provisions of Section 5, and if Landlord determines that there are no applicable or claimed stop notices (or any other statutory or equitable liens of anyone performing any of Tenant Alterations or providing materials for Tenant Alterations) or actions thereon, Landlord shall disburse the applicable portion of the Allowance as follows:

(a) In the event of conditional releases, to the respective contractor, subcontractor, vendor, or other person who has provided labor and/or services in connection with the Tenant Alterations, upon the following terms and conditions: (i) such costs are included in the Budget, are Permanent Improvement Costs, are covered by the Allowance, and Tenant has completed and delivered to Landlord a written request for payment, in form reasonably approved by Landlord, setting forth the exact name of the contractor, subcontractor or vendor to whom payment is to be made and the date and amount of the bill or invoice, (ii) the request for payment is accompanied by the documentation set forth in Section 5.1; and (iii) Landlord, or Landlord's appointed representative, has inspected and approved the work for which Tenant seeks payment; or

(b) In the event of unconditional releases, directly to Tenant upon the following terms and conditions: (i) Tenant seeks reimbursement for costs of Tenant Alterations which have been paid by Tenant, are included in the Budget, are Permanent Improvement Costs, and are covered by the Allowance; (ii) Tenant has completed and delivered to Landlord a request for payment, in form reasonably approved by Landlord, setting forth the name of the contractor, subcontractor or vendor paid and the date of payment, (iii) the request for payment is accompanied by the documentation set forth in Section 5.1; and (iv) Landlord, or Landlord's appointed representative, has inspected and approved the work for which Tenant seeks reimbursement.

5.3. Tenant shall provide Landlord with the aforementioned documents by the fifteenth (15th) of the month and payment shall be made within thirty (30) days after such documentation is provided.

5.4. Prior to Landlord disbursing the Landlord's Retention to Tenant, Tenant shall submit to Landlord the following items within thirty (30) days after completion of the Tenant Alterations or such longer period as Landlord may permit: (i) "As Built" drawings and specifications pursuant to Section 2.5 above,
(ii) all unconditional lien releases from all general contractor(s) and subcontractor(s) performing work, (iii) a "Certificate of Completion" prepared by Tenant's Architect, and (iv) a final budget with supporting documentation detailing all costs associated with the Permanent Improvement Costs.

6. Changes, Additions or Alterations.

If Tenant desires to make any non-de minimis change, addition or alteration or desires to make any change, addition or alteration to any of the Building Systems after approval of the Issued for Construction Documents, Tenant shall prepare and submit to Landlord plans and specifications with respect to such change, addition or alteration. Any such change, addition or alteration shall be subject to Landlord's approval in accordance with the provisions of Section 2.2 of this Workletter. Tenant shall be responsible for any submission to and plan check and permit requirements of the applicable governmental authorities. Tenant shall be responsible for payment of the cost of any such change, addition or alteration if it would increase the Budget and Excess Cost previously submitted and approved pursuant to Section 5 above (subject to any remaining Allowance).

7. Miscellaneous.

7.1. Scope. Except as otherwise set forth in the Lease, this Workletter shall not apply to any space hereafter added to the Premises by Lease option or otherwise.

7.2. Tenant Alterations shall include (at Tenant's expense subject to application of the Allowance towards the costs of such items) for all of the Premises, when applicable:

(a) Landlord approved lighting sensor controls as necessary to meet applicable Laws;

(b) Building Standard fluorescent fixtures in all Building office areas;

(c) Building Standard meters for each of electricity and chilled water used by Tenant shall be connected to the Building's system and shall be tested and certified prior to Tenant's occupancy of the Premises by a State certified testing company;

(d) Building Standard ceiling systems (including tile and grid) and;

(e) Building Standard air conditioning distribution and Building Standard air terminal units.

7.3. Sprinklers. Subject to any terms, conditions and limitations set forth herein, Landlord shall provide an operative sprinkler system consisting of mains, laterals, and heads "AS IS" on the date of delivery of the Premises to Tenant. Tenant shall pay for piping distribution, drops and relocation of, or additional, sprinkler system heads and Building firehose or firehose valve cabinets, if Tenant's Plans and/or any applicable Laws necessitate such.

7.4. Floor Loading. Floor loading capacity shall be within building design capacity which is 150 pounds per square foot. Tenant may exceed floor loading capacity with Landlord's consent, at Landlord's sole discretion and must, at Tenant's sole cost and expense, reinforce the floor as required for such excess loading.

7.5. Work Stoppages. If any work on the Real Property other than Tenant Alterations is delayed, stopped or otherwise affected by construction of Tenant Alterations, Tenant shall immediately take those actions necessary or desirable to eliminate such delay, stoppage or effect on work on the Real Property other than Tenant Alterations.

7.6. Life Safety. Tenant (or Contractor) shall employ the services of a fire and life-safety subcontractor reasonably satisfactory to Landlord for all fire and life-safety work at the Building.

7.7. Locks. Tenant may purchase locks, cylinders and keys for the Premises from its own vendor, provided that (a) such vendor and the locks, cylinders and keys to be used are subject to Landlord's prior written approval; (b) of a make and model which are functional, operable and compatible with Landlord's master key system; (c) a master key or keys are provided to Landlord, of which Landlord may place one such master key in the "knox box" for use by the fire department and emergency personnel in the event of an emergency and may retain another key for Landlord's use for entry permitted under the Lease; and (d) the contact information for Tenant's vendor for locks, cylinders and keys used in the Premises shall be provided to Landlord with Tenant's request for approval.

7.8. Authorized Representatives. Tenant has designated Neill Bickel to act as Tenant's representative with respect to the matters set forth in this Workletter. Such representative(s) shall have full authority and responsibility to act on behalf of Tenant as required in this Workletter. Tenant may add or delete authorized representatives upon five (5) business days' notice to Landlord.

7.9. Intentionally Omitted.

7.10. Fee. Landlord shall receive a fee equal to one percent (1.0%) of the Allowance for Landlord's review and supervision of construction of the Tenant Alterations, which fee shall be paid by Landlord applying one percent (1.0%) of the Allowance in payment thereof. Such fee is in addition to Tenant's reimbursement of costs incurred by Landlord pursuant to other provisions hereof, including, without limitation, for Landlord's architects and engineers to review Tenant's Plans.

8. Force and Effect.

The terms and conditions of this Workletter shall be construed to be a part of the Lease and shall be deemed incorporated in the Lease by this reference. Should any inconsistency arise between this Workletter and the Lease as to the specific matters which are the subject of this Workletter, the terms and conditions of this Workletter shall control.

EXHIBIT B

FAIR MARKET RENTAL RATE

1. Definition of Fair Market Rental Rate. "**Fair Market Rental Rate**" shall mean the Monthly Base Rent equal to the monthly base rental per rentable square foot which a tenant would pay and which a willing landlord would accept for space comparable to the Premises in the Building and in other buildings in Seaport Centre and along the Highway 101 corridor in Redwood City, Redwood Shores, San Carlos and Belmont (the "**Applicable Market**") for the period for which such rental is to be paid and for a lease on terms substantially similar to those of the Lease (including, without limitation, those applicable to Taxes, Operating Expenses and exclusions, but also considering so-called net and triple net leases, and leases utilizing operating expense stops or base years, and making appropriate adjustment between such leases and this Lease, as described below), based on prevailing market conditions in the Applicable Market at the time such determination is made ("**Comparable Transactions**"). Without limiting the generality of the foregoing, Comparable Transactions shall be for a term similar to the term of tenancy and for space comparable in use, floor levels, view and orientation, square footage and location within the Building and in the Applicable Market as the transaction for which Fair Market Rental Rate is being determined; however, leases of unusual or odd shaped spaces shall not be considered. In any determination of Fair Market Rental Rate, the stated or contract monthly net or base rental in Comparable Transactions shall be appropriately adjusted to take into account the different terms and conditions prevailing in such transactions and those present in the Lease, including, without limitation: (a) the extent to which average annual expenses and taxes per rentable square foot payable by tenants in Comparable Transactions vary from those payable by Tenant under the Lease, and so, for example, if the Lease provides for payment of Rent Adjustments and/or certain Operating Expenses on the basis of increases over a base year, then the rate of Monthly Base Rent under the Lease shall be based upon a step-up to change the calendar year which serves as the base year for calculation of the base for such Operating Expenses for the Option Term to be the full calendar year in which the Option Term commences, and such step-up shall be considered in the determination of the Fair Market Rental Rate; (b) tenant improvements, value of existing tenant improvements, the concessions, if any, being given by landlords in Comparable Transactions, such as parking charge abatement, free rent or rental abatement applicable after substantial completion of any tenant improvements (and no adjustment shall be made for any free or abated rent during any construction periods), loans at below-market interest rates, moving allowances, space planning allowances, lease takeover payments and work allowances, as compared to any tenant improvement, refurbishment or repainting allowance given to Tenant under the Lease for the space for which Fair Market Rental Rate is being determined; (c) the brokerage commissions, fees and bonuses payable by landlords in Comparable Transactions (whether to tenant's agent, such landlord or any person or entity affiliated with such landlord), as compared to any such amounts payable by Landlord to the broker(s) identified with respect to the transaction for which Fair Market Rental Rate is being determined;
(d) the time value of money; (e) any material difference between the definition of rentable area and the ratio of project rentable to useable square feet in Comparable Transactions, as compared to such figures applicable to the space for which Fair Market Rental Rate is being determined; and (f) the extent to which charges for parking by tenants in Comparable Transactions vary from those payable by Tenant under the Lease.

2. Sealed Estimates. In the event the Lease requires Fair Market Rental Rate to be determined in accordance with this Exhibit, Landlord and Tenant shall meet within ten (10) business days thereafter and each simultaneously submit to the other in a sealed envelope its good faith estimate of Fair Market Rental Rate (the "**Estimates**"). If the higher Estimate is not more than one hundred five percent (105%) of the lower Estimate, then Fair Market Rental Rate shall be the average of the two Estimates. If such simultaneous submission of Estimates does not occur within such ten (10) business day period, then either party may by notice to the other designate any reasonable time within five (5) business days thereafter and any reasonable place at or near the Building for such meeting to take place. In the event only one party submits an Estimate at that meeting, such Estimate shall be Fair Market Rental. In the event neither party submits an Estimate at that meeting, the transaction for which Fair Market Rental Rate is being determined shall be deemed cancelled and of no further force or effect.

3. Selection of Arbitrators. If the higher Estimate is more than one hundred five percent (105%) of the lower Estimate, then either Landlord or Tenant may, by written notice to the other within five (5) business days after delivery of Estimates at the meeting, require that the disagreement be resolved by arbitration. In the event neither party gives such notice, the transaction for which Fair Market Rental Rate is being determined shall be deemed cancelled and of no further force or effect. Within five (5) business days after such notice, the parties shall select as arbitrators three (3) mutually acceptable independent MAI appraisers with experience in real estate activities, including at least five (5) years experience in appraising comparable life science space in the Applicable Market ("**Qualified Appraisers**"). If the parties cannot timely agree on such arbitrators, then within the following five (5) business days, each shall select and inform the other party of one (1) Qualified Appraiser and within a third period of five (5) business days, the two appraisers (or if only one (1) has been duly selected, such single appraiser) shall select as arbitrators a panel of three additional Qualified Appraisers, which three arbitrators shall proceed to determine Fair Market Rental Rate pursuant to Section 4 of this Exhibit. Both Landlord and Tenant shall be entitled to present evidence supporting their respective positions to the panel of three arbitrators.

4. Arbitration Procedure. Once a panel of arbitrators has been selected as provided above, then as soon thereafter as practicable each arbitrator shall select one of the two Estimates as the one which, in its opinion, is closer to Fair Market Rental Rate. Upon an Estimate's selection by two (2) of the arbitrators, it shall be the applicable Fair Market Rental Rate and such selection shall be binding upon Landlord and Tenant. If the arbitrators collectively determine that expert advice is reasonably necessary to assist them in determining Fair Market Rental Rate, then they may retain one or more qualified persons, including but not limited to legal counsel, brokers, architects or engineers, to provide such expert advice. The party whose Estimate is not chosen by the arbitrators shall pay the costs of the arbitrators and any experts retained by the arbitrators. Any fees of any counsel or expert engaged directly by Landlord or Tenant, however, shall be borne by the party retaining such counsel or expert.

5. Rent Pending Determination of Fair Market Rental Rate. In the event that the determination of Fair Market Rental Rate has not been concluded prior to commencement of the applicable rental period for the applicable space for which the Fair Market Rental Rate is being determined, Tenant shall pay Landlord Monthly Base Rent and Rent Adjustment Deposits as would apply under Landlord’s Estimate pursuant to Section 2 of this Exhibit until the Fair Market Rental Rate is determined. In the event that the Fair Market Rental Rate subsequently determined is different from the amount paid for the applicable period, then within thirty (30) days after such determination, Tenant shall pay Landlord any greater amounts due and Landlord shall credit Tenant (against the next Monthly Base Rent installments due) for any reduction in the amounts due.

EXHIBIT D

PERMITTED HAZARDOUS MATERIAL

[***]

[*] = CERTAIN MARKED INFORMATION HAS BEEN OMITTED FROM THIS EXHIBIT BECAUSE IT IS BOTH NOT MATERIAL AND IS THE TYPE THAT THE REGISTRANT TREATS AS PRIVATE OR CONFIDENTIAL.

CODEXIS, INC.

October 14, 2024

Sri Ryali

Re: Separation and Consulting Agreement

Dear Sri:

This letter sets forth the terms of the separation and consulting agreement (this "**Agreement**") that Codexis, Inc. (the "**Company**") is offering to you to aid in your employment transition from the Company.

1. Separation Date. You agree and acknowledge that your Company employment terminated on October 4, 2024 (the "**Separation Date**"). As of and following the Separation Date, (a) you were no longer employed as the Company's Chief Financial Officer, and (b) you no longer held any other employment, director, manager, or officer positions with the Company, its direct and indirect parents, and/or its direct and indirect subsidiaries (the Company, along with its direct and indirect parents and subsidiaries, the "**Company Group**").

2. Severance Benefits. Pursuant to the terms and conditions of that certain Change of Control Severance Agreement, effective as of January 27, 2023, entered into by and between you and the Company (as amended) (the "**Severance Agreement**"), as enhanced by this Agreement, the Company agrees that your employment termination will be treated as a "Covered Termination Outside of a Change of Control Period." As such, if: (i) you sign, date and return this Agreement to the Company on or within twenty-one (21) calendar days from the date of this Agreement and you allow it become effective in accordance with its terms, and (ii) you comply with the terms of this Agreement and your other Continuing Obligations owed to the Company Group as detailed in Section 6 below (collectively, clauses (i) and (ii), the "**Conditions**"), the Company will provide you with the following "**Severance Benefits**":

(a) Severance Payments. Severance pay equal to your final monthly base salary multiplied by twelve (12) (the total severance amount of $463,499.92) (the "**Severance Payments**"). The Severance Payments will be paid to you, subject to required payroll deductions and withholdings, on the Company's regular payroll schedule in effect following the Separation Date in the form of monthly salary continuation through December 31, 2024; provided, however that any such payments that are otherwise scheduled to be made prior to the Effective Date of this Agreement (as defined in Section 10(d) below) shall instead accrue and be made on the first administratively practicable payroll date following the Effective Date (but in any event no later than 60 days following the Separation Date), with the remaining monthly salary continuation payments from January 1, 2025 through the twelve (12) month anniversary of the Separation Date to be paid to you in a lump sum payment on the Company's first regular payroll schedule following January 1, 2025 (but in any event no later than January 31, 2025) The Severance Payments pursuant to this Section 2(a) are intended to be exempt from Section 409A of the Internal

Revenue Code of 1986, as amended (the "**Code**") under the separation pay plan exemption pursuant to Treasury Regulation §1.409A-1(b)(9).

(b) Continued Healthcare. If you timely elect continued coverage under COBRA, the Company will directly pay your COBRA premiums to continue your group health coverage (including coverage for your eligible dependents, if applicable) (the "**COBRA Premiums**") for a period of twelve
(12) months following the Separation Date (the "**COBRA Premium Period**"), provided, however, that
the Company's payment obligation of such COBRA Premium benefits will immediately cease if during the COBRA Premium Period you become eligible for group health insurance coverage through a new employer or you cease to be eligible for COBRA continuation coverage for any reason, including plan termination. In the event you become covered under another employer's group health plan or otherwise cease to be eligible for COBRA during the COBRA Premium Period, you must immediately notify the Company of such event. Notwithstanding the foregoing, if the Company determines, in its sole discretion, that it cannot pay the COBRA Premiums without potentially incurring financial costs or penalties under applicable law (including, without limitation, Section 2716 of the Public Health Service Act), regardless of whether you or your dependents elect or are eligible for COBRA coverage, the Company instead shall pay to you, on the first day of each calendar month following the Separation Date, a fully taxable cash payment equal to the applicable COBRA Premiums for that month (including the amount of COBRA Premiums for your eligible dependents) (such amount, the "**Special Cash Payment**"), for the remainder of the COBRA Premium Period. You may, but are not obligated to, use such Special Cash Payments toward the cost of COBRA premiums.

(c) 2024 Pro-Rata Bonus Payment. The Company will also pay you an amount equal to a pro-rata portion of your at-target bonus for the 2024 calendar year (calculated as seventy-five percent (75%) of your 2024 at-target bonus) (totaling $173,812.47) (the "**2024 Pro-Rata Bonus**"). The 2024 Pro-Rata Bonus will be paid to you in a lump sum, subject to required payroll deductions and withholdings, on the Company's first administratively practicable payroll date following the Effective Date (but in any event no later than 60 days following the Separation Date).

3. Consulting Relationship. If you satisfy the Conditions in Section 2 above, the Company agrees to retain you, and you agree to provide consulting services for the Company, under the following terms and conditions (the "**Consulting Relationship**").

(a) Consulting Period. The Consulting Relationship will be deemed to have begun on the Separation Date (the "**Consulting Start Date**") and will terminate on February 28, 2025, unless terminated earlier pursuant to Section 5(i) below (the "**Consulting Period**").

(b) Consulting Services. You agree to provide transitional consulting services to the Company Group in any area of your expertise, including but not limited to, completing critical projects and transitioning your duties and responsibilities as requested by Company's Chief Executive Officer ("**CEO**") or his designee (together, the "**Consulting Services**"). For the avoidance of doubt, you and the Company agree that the anticipated level of Consulting Services will not exceed 20% of the average level of services rendered by you to the Company Group over the preceding 36-month period and you shall have a "separation from service" for purposes of Section 409A of the Code, as of the Separation Date.

(c) Consulting Fees. During the Consulting Period, you will receive as consulting fees [*] per hour for services rendered as requested by the Company (the "**Consulting Fees**"). You will submit detailed invoices of your Consulting Services on a monthly basis, and the Company will provide payment of any owed Consulting Fees within thirty (30) days after receipt of such invoices.

(d) Equity Treatment. Your outstanding options to purchase Company common stock, restricted stock units and/or performance stock units (collectively, the "**Equity Awards**") that are scheduled to vest between the Separation Date and the expiration of the Consulting Period will remain outstanding and continue to vest in accordance with the normal vesting schedule applicable to the Equity Awards based on your continued Consulting Services, with any shares subject to a restricted stock unit or performance stock unit award that vests during the Consulting Period to be settled no later March 15, 2025 or such later date as required to comply with Section 409A of the Code, as set forth in the underlying Equity Award agreement. For the avoidance of doubt, the post-termination exercise period applicable to any outstanding and vested stock options held by you shall begin upon the expiration of the Consulting Period, subject to earlier termination upon the expiration of the option's original ten-year term. Any Equity Awards that do not vest during the Consulting Period shall terminate for no consideration as of the expiration of the Consulting Period.

(e) Limitations on Authority. You will have no responsibilities or authority as a consultant to the Company other than as provided above. You will have no authority to bind the Company Group to any contractual obligations, whether written, oral or implied. Unless as permitted as part of your Consulting Services, you agree not to represent or purport to represent the Company Group in any manner whatsoever to any third party (including but not limited to investors, business partners, or vendors).

(f) Independent Contractor Relationship. Your relationship with the Company will be that of an independent contractor, and nothing in this Agreement is intended to, or should be construed to, create a partnership, agency, joint venture or employment relationship between you and the Company or any member of the Company Group. Other than your eligibility for COBRA, you will not be entitled to any of the benefits that the Company Group may make available to its employees, including, but not limited to, group health or life insurance, profit sharing or retirement benefits. Because you are an independent contractor, the Company will not withhold or make payments for social security, make unemployment insurance or disability insurance contributions, or obtain workers' compensation insurance on your behalf. You are solely responsible for, and will file, on a timely basis, all tax returns and payments required to be filed with, or made to, any federal, state or local tax authority with respect to the performance of the Consulting Services and receipt of Consulting Fees under this Agreement, and will indemnify and hold harmless the Company Group with respect to the payment of any and all such taxes. No part of the Consulting Fees will be subject to withholding by the Company for the payment of any social security, federal, state or any other employee payroll taxes. The Company will report amounts paid to you as Consulting Fees by filing Form 1099-MISC with the Internal Revenue Service as required by law.

(g) Confidential Information and Inventions. In addition to your Continuing Obligations owed to the Company Group (as detailed in Section 6 below), and except as permitted by the "Protected Rights" in Section 11 below, you agree that, during the Consulting Period and thereafter, you will not use or disclose, other than in furtherance of the Consulting Services, any confidential or proprietary information or materials of the Company Group, including any confidential or proprietary information that you obtain or develop in the course of performing the Consulting Services. Any and all work product you create in the course of performing the Consulting Services will be the sole and exclusive property of the Company. You hereby assign to the Company all right, title, and interest in all inventions, techniques, processes, materials, and other intellectual property developed in the course of performing the Consulting Services.

(h) Other Work Activities. Throughout the Consulting Period, you retain the right to engage in employment, consulting, or other work relationships in addition to your Consulting Services for the Company Group, so long as such activities do not present a conflict of interest with the Company Group's business, and/or your obligations owed to the Company Group under this Agreement and/or the Continuing Obligations. In the event that it is unclear in any respect to you whether a particular activity would breach this commitment, you agree to contact the CEO to seek clarification.

(i) Early Termination of Consulting Period.

(i) You may terminate the Consulting Relationship for any reason upon five (5) days' prior written notice to the Company.

(ii) The Company may terminate the Consulting Relationship immediately, and without prior notice, for Cause, which includes (A) the willful and continued failure to substantially perform your obligations owed to the Company Group under this Agreement and/or the Continuing Obligations (other than as a result of physical or mental disability) after a written demand for substantial performance is delivered to you by the Company, which demand specifically identifies the manner in which the Company believes that you have not substantially performed your duties and that has not been cured within fifteen (15) days following receipt by you of the written demand; (B) commission of a felony (other than a traffic-related offense) that in the written determination of the Company is likely to cause or has caused material injury to the Company Group's business; (C) dishonesty with respect to a significant matter relating to the Company Group's business; or (D) material breach of any agreement by and between you and the Company Group (including, but not limited to, this Agreement and the Continuing Obligations), which material breach has not been cured within fifteen (15) days following receipt by you of written notice from the Company identifying such material breach.

(iii) For the avoidance of doubt, upon termination of the Consulting Relationship for any reason, you will no longer be eligible for, or receive, any Consulting Fees and your unvested Equity Awards shall thereupon terminate and the post-termination exercise period of your options will commence as of the date of such termination.

4. No Other Compensation or Benefits. You agree and acknowledge that, except as expressly provided in this Agreement, you have not earned and will not receive from the Company Group any additional compensation (including base salary, severance, bonus, incentive compensation, commissions, or equity) or benefits prior to, on, or after the Separation Date, other than any vested benefits to which you are entitled under broad-based employee benefit plans of the Company Group in which you participate.

5. Return of Company Property. Except as otherwise noted in this Section 5, on or within five (5) calendar days following the Separation Date, or earlier if requested by the Company, you agree to return to the Company all Company Group documents (and all copies thereof) and all Company Group property and equipment that you have in your possession or control, including but not limited to any materials of any kind that contain or embody any proprietary or confidential information of the Company Group in whatever form (including information in electronic form and all reproductions thereof in whole or in part). You further agree that you will not copy, delete, or alter in any way any Company Group information or material contained upon any Company issued computer or Company equipment. In addition, if you have used any personally owned computer, server, e-mail system or cloud system (*e.g.*,

Box, Dropbox, GoogleDrive), memory stick, flash memory card, or portable electronic device (*e.g.*, iPhone, iPad, Android) (collectively, "**Personal Systems**") to receive, store, prepare or transmit any Company Group confidential or proprietary data, materials or information, then on or within five (5) calendar days following the Separation Date, or earlier if requested by the Company, you must provide the Company with a computer-useable forensic copy of all such information and then permanently delete and expunge all such Company Group confidential or proprietary information from such Personal Systems without retaining any copy or reproduction in any form. Notwithstanding the foregoing, you will be permitted to retain possession of your Company-issued laptop for the duration of the Consulting Period. You agree to use the laptop solely for work-related purposes. Upon termination of the Consulting Period, or earlier if requested by the Company, you will return the laptop and any remaining Company Group documents in your possession or control to the Company.

6. Continuing Obligations. You acknowledge and reaffirm your continuing obligations owed to the Company Group, including without limitation, pursuant to: (a) your executed December 30, 2022 Proprietary Information, Inventions and Employment Agreement entered into with the Company (the "**PIIEA**"); (b) those sections of the Severance Agreement that survive your employment termination, including without limitation, Section 12 ("Confidentiality; Non-Solicitation"); and (c) any other similar agreement entered into by you and which benefits or may be enforced by the Company or any other member of the Company Group (collectively, the "**Continuing Obligations**"), each of which agreements and obligations remain in full force and effect in accordance with their terms following the Separation Date. Additionally, you agree to timely sign and deliver to the Company the "Termination Certification" attached to the PIIEA as Exhibit C.

7. No Disparagement. Except as permitted by the "Protected Rights" in Section 11 below, you agree not to disparage any member of the Company Group and each of their respective officers, directors, managers, members, employees, shareholders, investors and agents, in any manner likely to be harmful to them or their business, business reputation or personal reputation. Nothing in this Section, this Agreement, or any other agreement entered into with the Company Group will be interpreted or construed to prevent you from giving truthful information to any law enforcement officer, court, administrative proceeding or as part of an investigation by any government agency, or is intended to prohibit or restrain you in any manner from making disclosures that are protected under federal law or regulation or under other applicable law or regulation (including disclosures that are protected under the whistleblower provisions of any federal or state law).

8. No Admissions. The promises and payments in consideration of this Agreement are not and shall not be construed to be an admission of any liability or obligation by either party to the other party, and neither party makes any such admission.

9. Cooperation. From and after the date of this Agreement, you agree to cooperate fully with the Company Group, or any member thereof, in connection with its or their actual or contemplated defense, prosecution, or investigation of any claims or demands by or against third parties, or in connection with other matters arising from events, acts, or failures to act that occurred during the period of your employment by the Company Group; provided, that such cooperation will not unreasonably burden you or unreasonably interfere with your subsequent employment or other business or personal affairs. Such cooperation includes making yourself available to the Company Group upon reasonable notice, without subpoena, to provide complete, truthful and accurate information in witness interviews, depositions, and trial testimony. The Company will reimburse you for reasonable and pre-approved out-of-pocket expenses you incur in connection with any such cooperation, excluding forgone wages, salary, or other compensation, and will accommodate your scheduling needs.

10. Release of Claims.

(a) General Release. In exchange for the consideration provided to you under the Agreement to which you would not otherwise be entitled, including but not limited to the Severance Benefits and the Consulting Relationship, you (for yourself and for any person who may make a claim by or through you (including without limitation, any current or former spouse(s), dependents, heirs, assignees, executors, attorneys, or agents)) hereby generally and completely release the Company and its current and former predecessors, successors, direct and indirect parents, direct and indirect subsidiaries, affiliates, investors, and related entities (collectively, the "**Entities**") and each of the Entities' respective current and former directors, officers, employees, shareholders, partners, members, agents, attorneys, insurers, assigns, and employee benefit plans of and from any and all claims, liabilities, and obligations, both known and unknown, that arise out of or are in any way related to events, acts, conduct, or omissions occurring prior to or on the date you sign this Agreement (collectively, the "**Released Claims**").

(b) Scope of Release. The Released Claims include, but are not limited to: (i) all claims arising out of or in any way related to your employment with or services for the Company or any other member of the Company Group, or the termination of that employment or those services; (ii) all claims related to your compensation or benefits from the Company or any other member of the Company Group, including salary, bonuses, incentive compensation, commissions, paid time off, severance benefits, notice rights, retention benefits, fringe benefits, stock, stock options, restricted stock, units, or any other ownership interests in the Company or any other member of the Company Group or their predecessors; (iii) all claims for breach of contract (oral or written), wrongful termination, and breach of the implied covenant of good faith and fair dealing; (iv) all tort claims, including claims for fraud, inducement, misrepresentation, defamation, emotional distress, and discharge in violation of public policy; and (v) all constitutional, federal, state, and local statutory and common law claims, in each case, as amended, including, but not limited to, claims for discrimination, harassment, retaliation, interference, attorneys' fees, and/or other claims arising under the federal Civil Rights Act of 1964 and all similar state and local laws, the federal Americans with Disabilities Act of 1990 and all similar state and local laws, the federal Age Discrimination in Employment Act, as amended by the Older Workers Benefit Protection Act (collectively, the "**ADEA**") and all similar state and local laws, the federal Family and Medical Leave Act and all similar state and local laws (the "**FMLA**"), the federal Equal Pay Act and all similar state and local laws, the federal Employee Retirement Income Security Act of 1974, the Federal Fair Credit Reporting Act and all similar state and local laws, the California Fair Employment and Housing Act, the California Labor Code, and any and all claims arising from or related to any other federal, state or local fair employment practices act, statute, code, regulation, and/or ordinance. **You acknowledge that you have been advised, as required by California Government Code Section 12964.5(b)(4), that you have the right to consult an attorney regarding this Agreement and that you were given a reasonable time period of not less than five (5) business days in which to do so**.

(c) Excluded Claims. The Released Claims in this Agreement do not include (i) any rights to indemnification you may have pursuant to the terms and conditions of the Company Group's governing corporate documents, pursuant to any written indemnification agreement with the Company Group to which you are a party, under applicable law, or pursuant to the terms and conditions of any directors and officers' liability insurance policy of any member of the Company Group; (ii) your rights to enforce the terms of this Agreement, and (iii) any rights that are not waivable as a matter of law, including without limitation, any rights you may have to seek unemployment or workers' compensation benefits.

(d) ADEA Waiver. You acknowledge that you are knowingly and voluntarily waiving and releasing any rights you may have under the ADEA (the "**ADEA Waiver**"), and that the consideration given for this ADEA Waiver is in addition to anything of value to which you are already entitled. You further acknowledge that you have been advised, as required by the ADEA, that: (i) your ADEA Waiver does not apply to any rights or claims that may arise after the date that you sign this Agreement; (ii) you should consult with an attorney prior to signing this Agreement; (iii) you have twenty- one (21) calendar days to consider this Agreement (although you may choose voluntarily to sign it earlier); (iv) you have seven (7) calendar days following the date you sign this Agreement to revoke your acceptance of the Agreement (by providing written notice of your revocation to Karen Frechou-Armijo, the Company's SVP, Head of Human Resources); and (v) this Agreement will not be effective until the date upon which the revocation period has expired unexercised, which will be the eighth calendar day after the date that you sign this Agreement, provided that you do not revoke your acceptance (the "**Effective Date**")

(e) Waiver of Unknown Claims. In giving the releases set forth in this Agreement, which include claims that may be unknown to you at present, you acknowledge that you have read and understand Section 1542 of the California Civil Code which reads as follows: **"A general release does not extend to claims that the creditor or releasing party does not know or suspect to exist in his or her favor at the time of executing the release and that, if known by him or her, would have materially affected his or her settlement with the debtor or released party."** You hereby expressly waive and relinquish all rights and benefits under that section and any law or legal principle of similar effect in any jurisdiction with respect to your release of claims herein, including but not limited to the release of unknown and unsuspected claims.

11. Protected Rights. You understand that nothing in this Agreement prevents you from filing a charge or complaint with the Equal Employment Opportunity Commission, the National Labor Relations Board, the Occupational Safety and Health Administration, the Securities and Exchange Commission or any other federal, state or local governmental agency or commission (collectively, the "**Government Agencies**"). This Agreement does not limit your ability to communicate with any Government Agencies or otherwise participate in any investigation or proceeding that may be conducted by any Government Agencies, including providing documents or other information, without notice to the Company. While this Agreement does not limit your right to receive an award for information provided to the Securities and Exchange Commission or to receive a monetary award from a government- administered whistleblower award program, you understand and agree that, to maximum extent permitted by law, you are otherwise waiving any and all rights you may have to individual relief based on any claims that you have released and any rights you have waived by signing this Agreement. Nothing in this Agreement prevents you from discussing or disclosing employee wages, benefits or terms and conditions of employment, or information about unfair or unlawful acts or employment practices in the workplace, such as harassment or discrimination or any other conduct that you have reason to believe is unlawful. Additionally, you further acknowledge that the Company has advised you that you will not be held civilly or criminally liable under any federal or state trade secret law for the disclosure of a trade secret that: (a) is made (i) in confidence to a federal, state, or local government official, either directly or indirectly, or to an attorney, and (ii) solely for the purpose of reporting or investigating a suspected violation of law; or (b) is made in a complaint or other document that is filed under seal in a lawsuit or other proceeding; or (c) is made to an attorney or is used in a court proceeding in connection with a lawsuit alleging retaliation for reporting a suspected violation of law, provided that the trade secret is filed under seal and not disclosed except pursuant to court order.

12. Representations. You hereby represent that, as of the date you execute this Agreement: you have been paid all compensation owed and payable through the date of this Agreement and for all time worked; you have received all the leave and leave benefits and protections for which you are eligible pursuant to FMLA or any applicable federal or state law or Company policy through the date of this Agreement; and you have not suffered any on-the-job injury or illness for which you have not already filed a workers' compensation claim. You further acknowledge and represent that: (a) you are not relying upon any statements, understandings, representations, expectations, or agreements other than those expressly set forth in this Agreement; (b) you have made your own investigation of the facts and you are relying solely upon your own knowledge; (c) you are knowingly waiving any claim that this Agreement was induced by any misrepresentation or nondisclosure; (d) you have read and understand the terms and effect of this Agreement; and (e) you are knowingly and voluntarily agreeing to all of the terms set forth in this Agreement and to be bound by this Agreement.

13. Section 409A. The parties intend that this Agreement and the payments made hereunder will be exempt from, or if not so exempt, comply with, the requirements of Section 409A of the Code, and shall be interpreted and construed consistently with such intent. Without limiting the foregoing, the Separation Benefits payable to you pursuant to Section 2 are intended to be exempt from Section 409A of the Code to the maximum extent possible, as short-term deferrals pursuant to Treasury Regulation §1.409A-1(b)(4) or payments made pursuant to a separation pay plan pursuant to Treasury Regulation §1.409A-1(b)(9). Each amount to be paid or benefit to be provided under this Agreement shall be construed as a separate and distinct payment for purposes of Section 409A of the Code.

14. General. This Agreement, along with the Continuing Obligations detailed in Section 6 above (which are separate agreements and obligations that shall remain in full force and effect in accordance with their terms following the Separation Date), constitutes the complete, final and exclusive embodiment of the entire agreement between you and the Company with regard to the subject matter hereof. It is entered into without reliance on any promise or representation, written or oral, other than those expressly contained herein, and it supersedes and terminates any other agreements, promises, warranties or representations by and between you, the Company and all other members of the Company Group concerning its subject matter. This Agreement may not be modified or amended except in a writing signed by both you and the Company's Board of Directors. This Agreement is governed by the laws of the State of California, without reference to conflicts of law principles, and will bind the heirs, personal representatives, successors and assigns of both you and the Company, and inure to the benefit of both you and the Company, their heirs, successors and assigns. If any provision of this Agreement is determined to be invalid or unenforceable, in whole or in part, this determination shall not affect any other provision of this Agreement and the provision in question shall be modified so as to be rendered enforceable in a manner consistent with the intent of the parties insofar as possible under applicable law. Any ambiguity in this Agreement shall not be construed against either party as the drafter. Any waiver of a breach of this Agreement, or rights hereunder, shall be in writing and shall not be deemed to be a waiver of any successive breach or rights hereunder. This Agreement may be executed in two or more counterparts, each of which will be deemed an original, but all of which together will constitute one and the same instrument. Counterparts may be delivered via facsimile, electronic mail (including pdf or any electronic signature complying with the U.S. federal ESIGN Act of 2000, Uniform Electronic Transactions Act or other applicable law) or other transmission method and any counterpart so delivered will be deemed to have been duly and validly delivered and be valid and effective for all purposes.

[***Signature Page to Follow***]

If this Agreement is acceptable to you, please sign below on or within twenty-one (21) calendar days from the date of this Agreement and then promptly return the fully signed original to me. The Company's offer contained herein will automatically expire if we do not receive the fully signed Agreement from you within this timeframe.

We wish you the best in your future endeavors.

Sincerely,

Codexis, Inc.

By:/s/ Stephen Dilly__ Stephen Dilly, MBBS, Ph.D.
Chairman, President and Chief Executive Officer

Agreed and Acknowledged:

/s/ Sri Ryali
Sri Ryali

Date: 10/16/2024

SECOND AMENDMENT TO LOAN AND SECURITY AGREEMENT

This **SECOND AMENDMENT TO LOAN AND SECURITY AGREEMENT** (this "**Agreement**") is entered into as of December 20, 2024, by and among INNOVATUS LIFE SCIENCES LENDING FUND I, LP, a Delaware limited partnership (together with its successors and assigns, "**Innovatus**"), as collateral agent (in such capacity, together with its successors and assigns in such capacity, "**Collateral Agent**"), the Lenders listed on Schedule 1.1 thereof or otherwise a party thereto from time to time (each a "**Lender**" and collectively, "**Lenders**"), and CODEXIS, INC., a Delaware corporation ("**Borrower**").

Recitals

A. Collateral Agent, Lenders, and Borrower have entered into that certain Loan and Security Agreement dated as of February 13, 2024, as amended by that certain First Amendment to Loan and Security Agreement, dated as of May 1, 2024, and effective as of February 13, 2024 (as the same may from time to time be amended, modified, supplemented or restated, the "**Loan Agreement**").

B. Lenders have extended credit to Borrower for the purposes permitted in the Loan Agreement.

C. Borrower and Lenders desire to extend the Specified Period in accordance with the terms set forth herein.

D. Collateral Agent and Lenders have agreed to amend the Loan Agreement, but only to the extent, in accordance with the terms, subject to the conditions and in reliance upon the representations and warranties set forth below.

Agreement

Now, Therefore, in consideration of the foregoing recitals and other good and valuable consideration, the receipt and adequacy of which is hereby acknowledged, and intending to be legally bound, the parties hereto agree as follows:

1. Definitions. Capitalized terms used but not defined in this Agreement shall have the meanings given to them in the Loan Agreement.

2. Amendments. The Loan Agreement is hereby amended as set forth below:

2.1 Section 13 (Definitions). The definition of "Specified Period" in Section 13 of the Loan Agreement is hereby amended and restated as set forth below:

"**Specified Period**" means the period commencing on the Effective Date and ending on the earlier of (i) the date of dissolution of Codexis India and (ii) September 30, 2025.

3. Limitation of Agreement.

3.1 This Agreement is effective for the purposes set forth herein and shall be limited precisely as written and shall not be deemed to (a) be a consent to any amendment, waiver or modification of any other term or condition of any Loan Document, or (b) otherwise prejudice any right or remedy which Collateral Agent and Lenders may now have or may have in the future under or in connection with any Loan Document.

3.2 This Agreement shall be construed in connection with and as part of the Loan Documents, and all terms, conditions, representations, warranties, covenants and agreements set forth in the Loan Documents are hereby ratified and confirmed and shall remain in full force and effect.

4. Representations and Warranties. Borrower represents and warrants to Collateral Agent and Lenders as follows:

4.1 (a) the representations and warranties contained in the Loan Documents are true, accurate and complete in all material respects (except those representations and warranties that are qualified by materiality which shall be true and correct in all respects) as of the date hereof (except to the extent such representations and warranties relate to an earlier date, in which case they are true and correct as of such date), and (b) no Event of Default has occurred and is continuing immediately before and after giving effect to this Agreement;

4.2 Borrower has the power and authority to execute and deliver this Agreement and to perform its obligations under the Loan Agreement;

4.3 The organizational documents of Borrower delivered to Collateral Agent and Lenders on the Effective Date or subsequent thereto remain true, accurate and complete and have not been amended, supplemented or restated and are and continue to be in full force and effect;

4.4 The execution and delivery by Borrower of this Agreement and the performance by Borrower of its obligations under the Loan Agreement have been duly authorized by all necessary action on the part of Borrower;

4.5 The execution and delivery by Borrower of this Agreement and the performance by Borrower of its obligations under the Loan Agreement do not and will not contravene (a) any law or regulation binding on or affecting Borrower, (b) any contractual restriction with a Person binding on Borrower, (c) any order, judgment or decree of any court or other governmental or public body or authority, or subdivision thereof, binding on Borrower, or (d) the organizational documents of Borrower;

4.6 The execution and delivery by Borrower of this Agreement and the performance by Borrower of its obligations under the Loan Agreement do not require any order, consent, approval, license, authorization or validation of, or filing, recording or registration with, or exemption by any governmental or public body or authority, or subdivision thereof, binding on either Borrower, except as already has been obtained or made; and

4.7 This Agreement has been duly executed and delivered by Borrower and is the binding obligation of Borrower, enforceable against Borrower in accordance with its terms, except as such enforceability may be limited by bankruptcy, insolvency, reorganization, liquidation, moratorium or other similar laws of general application and equitable principles relating to or affecting creditors' rights.

5. Prior Agreement. The Loan Documents are hereby ratified and reaffirmed and shall remain in full force and effect. This Agreement is not a novation and the terms and conditions of this Agreement shall be in addition to and supplemental to all terms and conditions set forth in the Loan Documents. In the event of any conflict or inconsistency between this Agreement and the terms of such documents, the terms of this Agreement shall be controlling, but such document shall not otherwise be affected or the rights therein impaired.

6. Integration. This Agreement and the Loan Documents represent the entire agreement about this subject matter and supersede prior negotiations or agreements. All prior agreements, understandings, representations, warranties, and negotiations between the parties about the subject matter of this Agreement and the Loan Documents merge into this Agreement and the Loan Documents.

7. Counterparts. This Agreement may be executed in any number of counterparts and all such counterparts taken together shall be deemed to constitute one and the same instrument.

8. Conditions to Effectiveness. This Agreement shall be deemed effective upon the due execution and delivery to Collateral Agent and Lenders, in form and substance reasonably satisfactory to Collateral Agent and each Lender, such documents, and completion of such other matters, as Collateral Agent and each Lender may reasonably deem necessary or appropriate (and requested in writing at least three Business Days prior to the date hereof), including, without limitation:

a) this Agreement duly executed by each party hereto; and

b) Borrower's payment of all Lenders' Expenses incurred through the date of this Agreement to the extent due and payable.

9. Miscellaneous.

9.1 This Agreement shall constitute a Loan Document under the Loan Agreement; and all obligations included in this Agreement (including, without limitation, all obligations for the payment of principal, interest, fees, and other amounts and expenses) shall constitute obligations under the Loan Agreement and secured by the Collateral.

9.2 Each provision of this Agreement is severable from every other provision in determining the enforceability of any provision.

10. Governing Law. This Agreement and the rights and obligations of the parties hereto shall be governed by and construed in accordance with the laws of the State of New York.

[Signature pages follow.]

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed as of the date first written above.

BORROWER:

CODEXIS, INC.

By /s/ Georgia Erbez
Name: Georgia Erbez
Title: Chief Financial Officer

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed as of the date first written above.

COLLATERAL AGENT AND LENDER:

INNOVATUS LIFE SCIENCES LENDING FUND I, LP

By: Innovatus Life Sciences GP, LP
Its: General Partner

By: /s/ Andrew Dym

Name: Andrew Dym

Title: Authorized Signatory

INSIDER TRADING COMPLIANCE PROGRAM

Approved by the Company's Board of Directors
on May 9, 2024

This Insider Trading Compliance Program (the "Program") consists of six sections:

Section I provides an overview; Section II sets forth Codexis, Inc.'s policies prohibiting insider trading; Section III explains insider trading; Section IV consists of various procedures which have been put in place by Codexis, Inc. to prevent insider trading; Section V sets forth policies regarding 10b5-1 trading plans; and Section VI includes Certification of Compliance instructions.

I. SUMMARY

Preventing insider trading is necessary to comply with securities laws and to preserve the reputation and integrity of Codexis, Inc. (the "Company") as well as that of all individuals affiliated with it. "Insider trading" occurs when any individual purchases or sells a security while in possession of inside information relating to the security. As explained in Section III below, "inside information" is information which is considered to be both "material" and "non-public." Insider trading is a crime and the penalties for violating the law include imprisonment, disgorgement of profits, civil fines of up to three times the profit gained or loss avoided, and criminal fines. Insider trading is also prohibited by this Program and could result in serious sanctions, including dismissal.

This Program applies to all officers, directors, employees and consultants of the Company, and extends to all activities within and outside an individual's duties at the Company. Individuals subject to this Program are responsible for ensuring that members of their households also comply with this Program. This Program also applies to any entities controlled by individuals subject to the Program, including any corporations, partnerships or trusts, and transactions by these entities should be treated for the purposes of this Program and applicable securities laws as if they were for the individual's own account. The Company will not purchase, sell or transact in Company Securities in violation of applicable securities laws or stock exchange listing standards. Every officer, director, employee, and consultant and must review this Program. Questions regarding the Program should be directed to the Company's Compliance Officer or the Company's Chief Financial Officer.

A good general rule of thumb: **when in doubt, do not trade.**

II. STATEMENT OF POLICIES PROHIBITING INSIDER TRADING

No officer, director, employee or consultant, or any member of the household of any such individual, shall purchase, sell, or gift any type of security while in possession of material, non-public information relating to the security, whether the issuer of such security is the Company or any other company.

Additionally, neither the Company nor any of its officers, employees or directors, nor any member of the household of any such individual, shall purchase, sell, or gift any security of the Company during the period beginning two weeks before the end of any fiscal quarter of the Company and ending two full trading days after the public release of earnings data for such fiscal quarter, whether or not the Company or any of such individuals is in possession of material, non-public information (the "Black-Out Period").

The Black-Out Period does not apply to:

- purchases of the Company's securities from the Company or sales of the Company's securities to the Company, including surrender of shares to the Company upon vesting or settlement of equity-based awards to cover withholding obligations with respect to such vesting or settlement that do not involve a market sale of the Company's securities;

- exercises of stock options or other equity awards or the surrender of shares to the Company in payment of the exercise price or in satisfaction of any tax withholding obligations in a manner permitted by the applicable equity award agreement, or vesting of equity-based awards, in each case, that do not involve a market sale of the Company's securities, including the receipt of shares in settlement of any restricted stock unit agreement or stock appreciation rights agreement; or

- purchases, sales, or gifts of the Company's securities made pursuant to a plan adopted that meets all requirements of the affirmative defense provided by Rule 10b5-1 ("Rule 10b5-1") promulgated under the Securities Exchange Act of 1934, as amended (the "1934 Act").

Note: The Black-Out Period does apply to market sales of stock acquired upon the exercise of a stock option or the vesting of equity-based awards, including any such sale as part of a broker-assisted cashless exercise of an option, or any other market sale for the purposes of generating the cash needed to pay the exercise price of the option or to cover tax obligations upon the exercise, vesting or settlement of the equity-based award.

In certain limited circumstances, the Company may permit trading pursuant to other pre-established trading arrangements. Any such trading arrangement must be expressly authorized in advance of adoption by the Compliance Officer.

Exceptions to the Black-Out Period policy may be approved only by the Compliance Officer or, in the case of exceptions for directors or officers under Securities

and Exchange Commission ("SEC") Rule 16a-1(f), the Board of Directors or Audit Committee of the Board of Directors.

From time to time, the Company, through the Board of Directors or the Compliance Officer, may recommend that officers, directors, and certain specified employees suspend trading in the Company's securities because of developments that have not yet been disclosed to the public. Subject to the exceptions noted above, all those affected should not trade in the Company's securities while the suspension is in effect, and should not disclose to others that the Company has suspended trading.

For the purposes of this Program, a "trading day" shall mean a day on which national stock exchanges are open for trading.

No officer, director, employee, or consultant, nor any member of the household of any such individual, shall directly or indirectly tip material, non-public information to anyone while in possession of such information. In addition, material, non-public information should not be communicated to anyone outside the Company under any circumstances (absent prior approval by the Compliance Officer or execution of an appropriate confidentiality agreement), or to anyone within the Company other than on a need-to-know basis.

III. EXPLANATION OF INSIDER TRADING

As noted above, "insider trading" refers to the purchase, sale, or gifts of a security while in possession of "material," "non-public" information relating to the security. "Securities" include not only stocks, bonds, notes and debentures, but also options, warrants and similar instruments. "Purchase" and "sale" are defined broadly under the federal securities laws. "Purchase" includes not only the actual purchase of a security, but any contract to purchase or otherwise acquire a security. "Sale" includes not only the actual sale of a security, but any contract to sell or otherwise dispose of a security. These definitions extend to a broad range of transactions including conventional cash-for-stock transactions, conversions, the exercise of stock options and acquisitions and exercises of warrants or puts, calls or other options related to a security. It is generally understood that insider trading includes the following:

- Trading by insiders while in possession of material, non-public information;
- Trading by individuals other than insiders while in possession of material, non-public information where the information either was given in breach of an insider's fiduciary duty to keep it confidential or was misappropriated; or
- Communicating or tipping material, non-public information to others, including recommending the purchase, sale, or gifts of a security while in possession of such information.

A. What Facts are Material?

The materiality of a fact depends upon the circumstances. A fact is considered "material" if there is a substantial likelihood that a reasonable investor would consider it important, as part of the total mix of available information, in making a decision to buy, sell or hold a security or where the fact is likely to have a significant effect on the market price of the security. Material information can be positive or negative and can relate to virtually any aspect of a company's business or to any type of security, debt or equity.

Examples of material information include (but are not limited to) facts concerning: financial results; dividends; corporate earnings or earnings forecasts; significant changes in corporate objectives; possible mergers or acquisitions; major litigation; significant developments in borrowings or financings; gain or loss of a substantial customer or supplier; calls, redemptions or purchases of the Company's securities by the Company; and information concerning product developments, important business developments and major litigation developments. Moreover, material information does not have to be related to a company's business. For example, the contents of a forthcoming newspaper column that is expected to affect the market price of a security can be material.

A good general rule of thumb: **when in doubt, do not trade.**

B. What is Non-public?

Information is "non-public" if it is not available to the general public. In order for information to be considered public, it must be widely disseminated in a manner making it generally available to investors through such media as Dow Jones, Reuters Economic Services, The Wall Street Journal, Business Wire, Associated Press, PR Newswire or United Press International, a Regulation FD compliant conference call or public disclosure documents filed with the SEC. The circulation of rumors, even if accurate and reported in the media, does not constitute effective public dissemination.

In addition, even after a public announcement, a reasonable period of time must lapse in order for the market to react to the information. Generally, one should allow two full trading days following publication as a reasonable waiting period before such information is deemed to be public.

C. Who is an Insider?

"Insiders" include officers, directors and employees of a company and anyone else (including consultants) who has material inside information about a company. Insiders have independent fiduciary duties to their company and its stockholders not to trade on material, non-public information relating to the company's securities. All officers, directors, employees and consultants of the Company should consider themselves insiders with respect to material, non-public information about the Company's business, activities and securities. Officers, directors, employees and consultants may not trade the Company's securities while in possession of material, non-public information relating to the Company nor tip (or communicate except on a need-to-know basis) such information to others.

Individuals subject to this Program are responsible for ensuring that any members of their households also comply with this Program. This Program also applies to any entities controlled by individuals subject to the Program, including any corporations, partnerships or trusts, and transactions by these entities should be treated for the purposes of this Program and applicable securities laws as if they were for the individual's own account.

D. Trading by Individuals Other than Insiders

Insiders may be liable for communicating or tipping material, non-public information to a third party ("tippee"), and insider trading violations are not limited to trading or tipping by insiders. Individuals other than insiders also can be liable for insider trading, including tippees who trade on material, non-public information tipped to them or individuals who trade on material, non-public information which has been misappropriated.

Tippees inherit an insider's duties and are liable for trading on material, non-public information illegally tipped to them by an insider. Similarly, just as insiders are liable for the insider trading of their tippees, so are tippees who pass the information along to others who trade. In other words, a tippee's liability for insider trading is no different from that of an insider. Tippees can obtain material, non-public information by receiving overt tips from others or through, among other things, conversations at social, business, or other gatherings.

E. Penalties for Engaging in Insider Trading

Penalties for trading on or tipping material, non-public information can extend significantly beyond any profits made or losses avoided, both for individuals engaging in such unlawful conduct and their employers. The SEC and Department of Justice have made the civil and criminal prosecution of insider trading violations a top priority. Enforcement remedies available to the government or private plaintiffs under the federal securities laws include:

- SEC administrative sanctions;
- Securities industry self-regulatory organization sanctions;
- Civil injunctions;
- Damage awards to private plaintiffs;
- Disgorgement of all profits;
- Civil fines for the violator of up to three times the amount of profit gained or loss avoided;
- Civil fines for the employer or other controlling person of a violator (i.e., where the violator is an employee or other controlled person);
- Criminal fines for individual violators; and

- Jail sentences.

In addition, insider trading could result in serious sanctions by the Company, including dismissal. Insider trading violations are not limited to violations of the U.S. federal securities laws: other federal and state civil or criminal laws, such as the laws prohibiting mail and wire fraud and the Racketeer Influenced and Corrupt Organizations Act ("RICO"), also may be violated upon the occurrence of insider trading.

F. Examples of Insider Trading

Examples of insider trading cases include actions brought against: corporate officers, directors, and employees who traded a company's securities after learning of significant confidential corporate developments; friends, business associates, family members, and other tippees of such officers, directors, and employees who traded the securities after receiving such information; government employees who learned of such information in the course of their employment; and other persons who misappropriated, and took advantage of, confidential information from their employers.

The following are illustrations of insider trading violations. These illustrations are hypothetical and, consequently, not intended to reflect on the actual activities or business of the Company or any other entity.

Trading by Insider

An officer of X Corporation learns that earnings to be reported by X Corporation will increase dramatically. Prior to the public announcement of such earnings, the officer purchases X Corporation's stock. The officer, an insider, is liable for all profits as well as penalties of up to three times the amount of all profits. The officer also is subject to, among other things, criminal prosecution. Depending upon the circumstances, X Corporation and the individual to whom the officer reports also could be liable.

Trading by Tippee

An officer of X Corporation tells a friend or family member that X Corporation is about to publicly announce that it has concluded an agreement for a major acquisition. This tip causes the friend/family member to purchase X Corporation's stock in advance of the announcement. The officer is jointly liable with his friend for all of the friend's/family member's profits and each is liable for all penalties of up to three times the amount of the profits. In addition, the officer and his friend/family member are subject to, among other things, criminal prosecution, as described above.

G. Prohibition of Records Falsifications and False Statements

Section 13(b)(2) of the 1934 Act requires companies subject to the 1934 Act to maintain proper internal books and records and to devise and maintain an adequate system of internal accounting controls. The SEC has supplemented the statutory requirements by adopting rules that prohibit (1) any person from falsifying records or accounts subject to the

above requirements and (2) officers or directors from making any materially false, misleading or incomplete statement to any accountant in connection with any audit or filing with the SEC. These provisions reflect the SEC's intent to discourage officers, directors and other persons with access to the Company's books and records from taking action that might result in the communication of materially misleading financial information to the investing public.

IV. STATEMENT OF PROCEDURES PREVENTING INSIDER TRADING

The following procedures have been established, and will be maintained and enforced, by the Company to prevent insider trading. Every officer, director, employee and consultant is required to follow these procedures.

A. Information Relating to the Company

1. Access to Information

Access to material, non-public information about the Company, including the Company's business, earnings or prospects, should be limited to officers, directors, employees and consultants of the Company on a need-to-know basis. In addition, such information should not be communicated to anyone outside the Company under any circumstances or to anyone within the Company on an other than need to know basis.

In communicating material, non-public information to officers, directors, employees and consultants of the Company, all officers, directors, employees and consultants must take care to emphasize the need for confidential treatment of such information and adherence to the Company's policies with regard to confidential information.

2. Inquiries From Third Parties

Media inquiries from third parties should be directed to media@codexis.com. Investor inquiries from third parties should be directed to ir@codexis.com.

B. Limitations on Access to Company Information

The following procedures are designed to maintain confidentiality with respect to the Company's business operations and activities.

1. All officers, directors, employees and consultants should take all steps and precautions necessary to restrict access to, and secure, material, non-public information by, among other things:

- Maintaining the confidentiality of Company related transactions;
- Conducting their business and social activities so as not to risk inadvertent disclosure of confidential information. Review of confidential documents in public places should be conducted so as to prevent access by unauthorized persons;

- Entering into confidentiality agreements with outside parties prior to sharing material, non-public information with such parties;
- Restricting access to documents and files (including computer files) containing material, non-public information to individuals on a need-to-know basis (including maintaining control over the distribution of documents and drafts of documents);
- Promptly removing and cleaning up all confidential documents and other materials from conference rooms following the conclusion of any meetings;
- Disposing of all confidential documents and other papers, after there is no longer any business or other legally required need, through shredders when appropriate;
- Restricting access to areas likely to contain confidential documents or material, non-public information; and
- Avoiding the discussion of material, non-public information in places where the information could be overheard by others such as in elevators, restrooms, hallways, restaurants, airplanes or taxicabs.

2. Personnel involved with material, non-public information, to the extent feasible, should conduct their business and activities in areas separate from other Company activities.

C. Pre-Clearance of Trades

To provide assistance in preventing inadvertent violations of applicable securities laws and to avoid the appearance of impropriety in connection with the purchase and sale of Company securities, **all transactions in Company securities (including without limitation, acquisitions and dispositions of Company Stock, the exercise of stock options and the sale of Company Stock issued upon exercise of stock options) by officers, directors and employees of the Company having the position of Vice President (or its equivalent) or higher within the Company, must be pre-cleared by the Compliance Officer or the Chief Financial Officer.** Pre-clearance does not relieve anyone of his or her responsibility under SEC rules.

A request for pre-clearance must be in writing (including by email) in a form approved by the Compliance Officer from time to time, delivered to the Compliance Officer (or, in the event the Compliance Officer or the Chief Financial Officer is not available, then the President and Chief Executive Officer (CEO) of the Company), should be made at least two business days in advance of the proposed transaction and should include the identity of the individual requesting pre-clearance, the type of proposed transaction (for example, an open market purchase, a privately negotiated sale, an option exercise, etc.), the proposed date of the transaction and the number of shares or other securities to be involved. In addition, the individual requesting pre-clearance must execute a certification that he or she has read and is

familiar with this Program and is not aware of material, non-public information about the Company. The Compliance Officer or Chief Financial Officer (or, in their absence, the President and CEO) shall have sole discretion to decide whether to clear any contemplated transaction. All trades that are pre-cleared must be effected within five business days of the date the Compliance Officer or Chief Financial Officer sends the pre-clearance approval to the requesting individual unless a specific exception has been granted by the Compliance Officer or the Chief Financial Officer (or, in their absence, the President/CEO). A pre-cleared trade (or any portion of a pre-cleared trade) that has not been effected during the five business day period must be pre-cleared again prior to execution.

All executive officers and directors must submit to the Compliance Officer a copy of any trade order or confirmation relating to the purchase, sale, or gift of Company Securities as soon as possible but no later than one (1) day of any such transaction. This information is necessary to enable the Company to monitor trading by executive officers and directors and ensure that all such trades are properly reported.

Notwithstanding receipt of pre-clearance, if the individual requesting pre-clearance becomes aware of material non-public information or becomes subject to a Black-Out Period before the transaction is effected, the transaction may not be completed.

None of the Company, the Compliance Officer, the Chief Financial Officer, the President and CEO or the Company's other employees will have any liability for any delay in reviewing, or refusal of, a request for pre-clearance. Notwithstanding any pre-clearance of a transaction pursuant to these procedures, none of the Compliance Officer, the Chief Financial Officer, the President and CEO or the Company's other employees assumes any liability for the legality or consequences of such transaction to the individual engaging in such transaction.

Additionally, none of the Company's employees, directors or consultants, or any member of the household of any such individual, may trade in any securities of the Company during the Black-Out Period, subject to exceptions described in Section II above.

D. Additional Prohibited Transactions

The Company has determined that there is a heightened legal risk and/or the appearance of improper or inappropriate conduct if the individuals subject to this Program engage in certain types of transactions. Therefore, such individuals and members of the household of any such individual, shall comply with the following policies with respect to certain transactions in the Company securities:

1. Short Sales

Short sales of the Company's securities evidence an expectation on the part of the seller that the securities will decline in value, and therefore signal to the market that the seller has no confidence in the Company or its short-term prospects. In addition, short sales may

reduce the seller's incentive to improve the Company's performance. For these reasons, short sales of the Company's securities are prohibited by this Program. In addition, as noted above, Section 16(c) of the 1934 Act absolutely prohibits Section 16 reporting persons from making short sales of the Company's equity securities, *i.e.*, sales of shares that the insider does not own at the time of sale, or sales of shares against which the insider does not deliver the shares within 20 days after the sale.

2. Publicly Traded Options

A transaction in options is, in effect, a bet on the short-term movement of the Company's Stock and therefore creates the appearance that an officer, director, employee or consultant is trading based on inside information. Transactions in options also may focus an officer's, director's, employee's or consultant's attention on short-term performance at the expense of the Company's long-term objectives. Accordingly, transactions in puts, calls or other derivative securities involving the Company's equity securities, on an exchange or in any other organized market, are prohibited by this Program.

3. Hedging Transactions

Certain forms of hedging or monetization transactions, such as zero-cost collars and forward sale contracts, allow an officer, director, employee or consultant to lock in much of the value of his or her stock holdings, often in exchange for all or part of the potential for upside appreciation in the stock. These transactions allow the officer, director, employee, consultant or Specified Person to continue to own the covered securities, but without the full risks and rewards of ownership. When that occurs, the officer, director, employee or consultant may no longer have the same objectives as the Company's other stockholders. Therefore, such transactions involving the Company's equity securities are prohibited by this Program.

4. Purchases of the Company's Securities on Margin; Pledging the Company's Securities to Secure Margin or Other Loans

Purchasing on margin means borrowing from a brokerage firm, bank or other entity in order to purchase the Company's securities (other than in connection with a cashless exercise of stock options under the Company's equity plans). Margin purchases of the Company's securities are prohibited by this Program. Pledging the Company's securities as collateral to secure loans is also prohibited. This prohibition means, among other things, that the Company's officers, directors, employees and consultants and members of the household of any such individual, cannot hold the Company's securities in a "margin account" (which would allow the holder to borrow against his or her holdings to buy securities).

V. RULE 10B5-1 TRADING PLANS

A. Overview

SEC Rule 10b5-1 provides an affirmative defense from insider trading liability under Rule 10b5-1 for transactions under a previously established contract, plan or instruction to trade the Company's Stock (a "Trading Plan") entered into in good faith at a time when the insider was not aware of material nonpublic information and in accordance with the terms of

Rule 10b5-1 of the 1934 Act and all applicable state laws. The initiation or revocation of, and any modification to, any such Trading Plan will be deemed to be a transaction in the Company's securities and such initiation, revocation or modification is subject to all limitations and prohibitions of transactions involving the Company's securities.

Each such Trading Plan, and any revocation or modification thereof, shall be submitted to and pre-approved by the Compliance Officer, the President and CEO, Chief Financial Officer or such other person as the Board of Directors may designate from time to time (the "Authorizing Officer"), who may impose such conditions on the implementation and operation of the Trading Plan as the Authorizing Officer deems necessary or advisable. Without limiting the generality of the foregoing, the Authorizing Officer may prescribe certain forms of Trading Plans. The Authorizing Officer may also require that Trading Plans be arranged with a specified broker. However, compliance of the Trading Plan to the terms of Rule 10b5-1 and the execution of transactions pursuant to the Trading Plan are the sole responsibility of the officer, director or employee initiating the Trading Plan, not the Company or the Authorizing Officer.

Rule 10b5-1 presents an opportunity for insiders to establish arrangements to sell (or purchase) Company Stock without the restrictions of windows and black-out periods even when there is undisclosed material information. The program might also help reduce negative publicity that may result when key executives sell the Company's Stock. Rule 10b5-1 only provides an "affirmative defense" in the event there is an insider trading lawsuit. It does not prevent someone from bringing a lawsuit.

A director, officer or employee may enter into a Trading Plan only when he or she is not in possession of material nonpublic information, and a director, officer or employee who is subject to the Black-Out Period may enter into a Trading Plan only during a trading window period outside of the Black-Out Period. Although transactions effected under a Trading Plan will not require further pre-clearance at the time of the trade, the transactions (including the quantity and price) made pursuant to a Trading Plan of an officer or director must be reported to the Company promptly on the day of each trade to permit the Company's filing coordinator to assist in the preparation and filing of a required Form 4. Once the plan is adopted, the insider must not exercise any influence over the amount of securities to be traded, the price at which securities are to be traded or the date of the trade.

From time to time, for legal or other reasons, the Authorizing Officer may direct that purchases and sales pursuant to any Trading Plan be suspended or discontinued. Failure of the officer, director or employee to discontinue purchases, sales, or gifts as directed shall constitute a violation of the terms of this paragraph and result in a loss of the exemption set forth herein.

It is the Company's policy that employees and directors may make trades pursuant to a Rule 10b5-1 plan provided that (i) such plan meets the requirements of Rule 10b5-1, (ii) such plan was adopted at a time when the employee or director would otherwise have been able to trade under the permitted trading period, as described in this Program and (iii) adoption of the plan was expressly authorized by the Authorizing Officer. Officers, directors and employees may adopt Trading Plans with brokers that outline a pre-set plan for trading

of the Company's Stock, including the exercise of options. The exemption provided by a Trading Plan is not available if the plan is established while in possession of material nonpublic information, even if the plan is structured so that the sale takes place only after the material nonpublic information is made public. Trades pursuant to a Trading Plan may occur at any time, subject to a "cooling-off" period, as described below, after adoption of the Trading Plan during which time no sales under the Trading Plan can be made. Please review the following description of how a Trading Plan works.

The cooling-offer period between when a Trading Plan is adopted or modified and when trades can occur is:

- Section 16 reporting persons: the cooling-off period extends to the later of a full 90 days after adoption or modification of a Trading Plan or two business days after filing the Form 10-K or Form 10-Q covering the fiscal quarter in which the Trading Plan was adopted, up to a maximum of 120 days; and

- Employees and any other persons, other than the Company: the cooling-off period extends 30 days after adoption or modification of a Trading Plan

Pursuant to Rule 10b5-1, an individual's purchase, sale, or gift of securities will not be "on the basis of" material, non-public information if:

- First, before becoming aware of the information, the individual, in good faith, enters into a binding contract to purchase or sell the securities, provides instructions to another individual to sell the securities or adopts a written plan for trading the securities (i.e. the Trading Plan). Additionally, for Trading Plans entered into by Section 16 reporting persons, the Trading Plan must include a representation in the Trading Plan that the Section 16 reporting person is (1) not aware of any material nonpublic information about the Company or its securities; and (2) adopting the Trading Plan in good faith and not as part of a plan or scheme to evade Rule 10b-5.

- Second, the Trading Plan must either:

  - specify the amount of securities to be purchased, sold, or gifted, the price at which the securities are to be purchased, sold, or gifted and the date on which the securities are to be purchased, sold, or gifted;

  - include a written formula or computer program for determining the amount, price and date of the transactions; or

  - prohibit the individual from exercising any subsequent influence over the purchase, sale, or gift of Company Stock under the Trading Plan in question.

- Third, the purchase, sale, or gift must occur pursuant to the Trading Plan and the individual must not enter into a corresponding hedging transaction or alter or deviate from the Trading Plan.

The individual must act in good faith with respect to the Trading Plan for the entire duration of the plan. Except under the limited circumstances permitted by Rule 10b5-1 (including eligible sell-to-cover transactions) and subject to preapproval by the Authorizing Officer, only one Trading Plan may be adopted at a time.

B. Revocation/Amendments to Trading Plans

Revocation of a Trading Plan should occur only in unusual circumstances. Revocation of a Trading Plan is subject to the prior review and approval of the Authorizing Officer. Once a Trading Plan has been revoked or terminated by the participant, the cooling off periods as described above will apply before trades can occur with respect to a newly establishing Trading Plan. Participants will not be allowed to revoke or terminate a Trading Plan more than once in any twelve-month period.

Under certain circumstances, a Trading Plan must be revoked. This includes circumstances such as the announcement of a merger or the occurrence of an event that would cause the transaction either to violate the law or to have an adverse effect on the Company. The Compliance Officer or administrator of the Company's stock plans is authorized to notify the broker in such circumstances, thereby insulating the insider in the event of revocation.

A person acting in good faith may modify or amend a Trading Plan so long as such modification or amendment is made outside of a Black-Out Period or other period during which the Company has suspended trading in the Company's securities, and at a time when the Trading Plan participant does not possess material, non-public information. Effectiveness of any modification or amendment of a Trading Plan will be subject to the prior review and approval of the Authorizing Officer. Trading Plan modifications or amendments, such as changing the amount subject to the Trading Plan, or the price or timing of the purchase, sale, or gift of the securities underlying a Trading Plan will trigger a new cooling-off period.

You should note that the revocation or amendment of a Trading Plan can result in the loss of an affirmative defense for past or future transactions under a Trading Plan. You should consult with your own legal counsel before deciding to revoke or amend a Trading Plan.

C. Discretionary Plans

Discretionary Trading Plans, where the discretion or control over trading is transferred to a broker, are not allowed.

The Authorizing Officer must pre-approve any Trading Plan, arrangement or trading instructions, etc., involving potential sales, purchases, or gifts of the Company's Stock or option exercises, including but not limited to, blind trusts or limit orders. The actual transactions effected pursuant to a pre-approved Trading Plan will not be subject to further pre- clearance for transactions in the Company's Stock once the Trading Plan or other arrangement has been pre-approved.

D. Limitation of Liability

None of the Company, the Authorizing Officer or the Company's other employees will have any liability for any delay in reviewing, or refusal of, a request related to a Trading Plan. Notwithstanding any review of a Trading Plan pursuant to these procedures, none of the Company, the Authorizing Officer or the Company's other employees assumes any liability for the legality or consequences relating to such Trading Plan.

E. Reporting (if required)

If required, a Form 144 will be filled out and filed by the individual/brokerage firm in accordance with the existing rules regarding Form 144 filings. A footnote at the bottom of the Form 144 should indicate that the trades "are in accordance with a Trading Plan that complies with SEC Rule 10b5-1 and was adopted on __[DATE]". Form 4s should be filed before the end of the second business day following the date that the broker, dealer or plan administrator informs the individual that a transaction was executed, provided that the date of such notification is not later than the third business day following the trade date. A similar footnote should be placed at the bottom of the Form 4 as outlined above.

F. Options

Cash exercise of options (i.e., you pay cash for the exercise price of the options and do not sell the underlying shares; cash exercise of options does not include broker-assisted cashless exercises) currently can be executed at any time. Same day sales (i.e., you pay cash or sell shares into the market as payment for the exercise price of the options, and then sell all or a portion of the underlying shares) are subject to trading windows/Black-Out Periods and pre-clearance approval requirements. However, the Company will permit same day sales under Trading Plans. If a broker is required to execute a same day sale in accordance with a Trading Plan, then the Company must have exercise forms attached to the Trading Plan that are signed, undated and with the number of shares to be exercised left blank. Once a broker determines that the time is right to exercise the option and dispose of the shares in accordance with the Trading Plan, the broker will notify the Company in writing and the administrator of the Company's stock plans will fill in the number of shares and the date of exercise on the previously signed exercise form. The insider should not be involved with this part of the exercise.

G. Trades Outside of a Trading Plan

Outside of a Black-Out Period, trades which differ from Trading Plan instructions that are already in place are allowed as long as the Trading Plan continues to be followed and such trades comply with all other laws, regulations, and policies under this Program.

Trading Plans do not exempt the individuals from complying with the Section 16 six-month short swing profit rules or liability.

H. Public Announcements

The Company may make a public announcement that Trading Plans are being implemented in accordance with Rule 10b5-1. It will consider in each case whether a public announcement of a particular Trading Plan should be made. It may also make public announcements or respond to inquiries from the media as transactions are made under a Trading Plan.

The Company reserves the right to publicly disclose, announce, or respond to inquiries from the media regarding the adoption, modification, or termination of a Trading Plan and non-Rule 10b5-1 trading arrangements, or the execution of transactions made under a Trading Plan.

I. Prohibited Transactions

The transactions prohibited under Section IV(D) of this Program, including among others short sales, put and call options, hedging transactions, margin purchases and pledges to secure margin loans, may not be carried out through a Trading Plan or other arrangement or trading instruction involving potential sales or purchases of the Company's securities.

VI. INTERPRETATION, AMENDMENT AND IMPLEMENTATION OF THIS PROGRAM

The Compliance Officer shall have the authority to interpret and update this Program and all related policies and procedures. In particular, such interpretations and updates of this Program, as authorized by the Compliance Officer, may include amendments to or departures from the terms of this Program, to the extent consistent with the general purpose of this Program and applicable securities laws.

VII. EXECUTION AND RETURN OF CERTIFICATION OF COMPLIANCE

Promptly after beginning service with the Company (or at any other time the Company requests), all directors, officers, and employees should read, review, and understand this Program. Each director, officer, and employee is required to acknowledge and attest to their understanding of this Program using the Company's then current attestation process, which, for example, could include the Compliance Officer and the Certification of Compliance form attached hereto as "Attachment A."

ATTACHMENT A

FORM OF CERTIFICATION OF COMPLIANCE

TO: Compliance Officer

FROM: ___

RE: INSIDER TRADING COMPLIANCE PROGRAM OF CODEXIS, INC.

I have received, reviewed, and understand the above-referenced Insider Trading Compliance Program and hereby undertake, as a condition to my present and continued affiliation with Codexis, Inc., to comply fully with the policies and procedures contained therein.

___ ___

SIGNATURE DATE

___

TITLE

Exhibit 23.1

Consent of Independent Registered Public Accounting Firm

We consent to the incorporation by reference in the registration statement (No. 333-279082) on Form S-3 and registration statements (No. 333-167752, 333-172166, 333-179903, 333-187711, 333-194524, 333-202596, 333-210022, 333-216587, 333-223693, 333-224885, 333-230037, 333-232262, 333-269163, 333-273661, 333-273662, and 333-281429) on Form S-8 of our report dated February 27, 2025, with respect to the consolidated financial statements of Codexis, Inc. and subsidiaries.

/s/ KPMG LLP.

San Francisco, California
February 27, 2025

Exhibit 23.2

Consent of Independent Registered Public Accounting Firm

We hereby consent to the incorporation by reference in the Registration Statements on Form S-3 (No. 333-279082) and Form S-8 (No. 333-167752, 333-172166, 333-179903, 333-187711, 333-194524, 333-202596, 333-210022, 333-216587, 333-223693, 333-224885, 333-230037, 333-232262, 333-269163, 333-273661, 333-273662, and 333-281429) of Codexis, Inc. of our report dated February 28, 2024, relating to the consolidated financial statements, which appears in this Annual Report on Form 10-K.

/s/ BDO USA, P.C.
San Francisco, CA

February 27, 2025

Exhibit 31.1

CERTIFICATION

I, Stephen Dilly, certify that:

1. I have reviewed this Annual Report on Form 10-K 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.
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: February 27, 2025

/s/Stephen Dilly

Stephen Dilly

Chairman of the Board of Directors, President, and Chief Executive Officer (Principal Executive Officer)

Exhibit 31.2

CERTIFICATION

I, Georgia Erbez, certify that:

1. I have reviewed this Annual Report on Form 10-K 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.
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: February 27, 2025

/s/Georgia Erbez
Georgia Erbez
Chief Financial Officer

Exhibit 32.1

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

In connection with the Annual Report of Codexis, Inc. (the "Company") on Form 10-K for the fiscal year ended December 31, 2024, as filed with the Securities and Exchange Commission (the "Report"), Stephen Dilly, Chairman of the Board of Directors, President and Chief Executive Officer of the Company and Georgia Erbez, 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: February 27, 2025

/s/Stephen Dilly

Stephen Dilly
Chairman of the Board of Directors, President, and Chief Executive Officer (Principal Executive Officer)

/s/Georgia Erbez

Georgia Erbez
Chief Financial Officer