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 September 30, 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 Number: 001-38720

Twist Bioscience Corporation
(Exact Name of Registrant as Specified in its Charter)

Delaware	**46-2058888**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**

681 Gateway Blvd, South San Francisco, CA 94080
(Address of principal executive offices and zip code)

(800) 719-0671
(Registrant's telephone number, including area code)

Securities Registered Pursuant to Section 12(b) of the Act:

Title of Each Class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock	**TWST**	**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 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 an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer	☒	Accelerated filer	☐
Non-accelerated filer	☐	Small 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 Exchange Act). YES ☐ NO ☒

As of March 31, 2024, the last business day of the registrant's most recently completed second fiscal quarter, the aggregate market value of shares of common stock held by non-affiliates of the registrant was approximately $1.92 billion based upon the closing sale price on the Nasdaq Global Select Market reported for such date.

The number of shares of the Registrant's common stock outstanding as of November 13, 2024, was 59,356,440.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the Registrant's definitive proxy statement to be filed in connection with its 2024 Annual Meeting of Stockholders are incorporated by reference into Part III of this Form 10-K.

TWIST BIOSCIENCE CORPORATION
ANNUAL REPORT ON FORM 10-K
FOR THE FISCAL YEAR ENDED SEPTEMBER 30, 2024

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Forward-looking statements

This Annual Report on Form 10-K for the fiscal year ended September 30, 2024, or Form 10-K, contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, or the Securities Act, and Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act. These statements relate to, among other matters, plans for product development and licensing to third parties, plans and timeframe for the commercial development of DNA data storage capabilities, expectations regarding market penetration, anticipated customer conversions to our products, plans to expand in the international markets, and identification and development of potential antibody candidates. Forward-looking statements are also identified by the words “believe,” “will,” “may,” “estimate,” “continue,” “anticipate,” “intend,” “should,” “plan,” “expect,” “predict,” “could,” “potentially” and variations of such words and similar expressions. You should not rely upon forward-looking statements as predictions of future events. Such statements are based on management’s expectations as of the date of this filing and involve many risks and uncertainties that could cause our actual results, events or circumstances to differ materially from those expressed or implied in our forward-looking statements. Such risks and uncertainties include:

- our ability to increase our revenue and our revenue growth rate;
- our ability to accurately estimate capital requirements and our needs for additional financing; our estimates of the size of our market opportunities;
- our ability to increase DNA production, reduce turnaround times and drive cost reductions for our customers;
- our ability to effectively manage our growth;
- our ability to successfully enter new markets and manage our international expansion;
- our ability to develop and commercialize additional products in the synthetic biology, biologic drug and data storage industries, including our Express Genes product;
- our ability to leverage our investment in our manufacturing facility in Wilsonville, Oregon;
- our ability to protect our intellectual property, including our proprietary DNA synthesis platform;
- costs associated with defending intellectual property infringement and other claims;
- the effects of increased competition in our business;
- our ability to keep pace with changes in technology and our competitors;
- our ability to successfully identify, evaluate and manage any future acquisitions of businesses, solutions or technologies;
- the success of our marketing efforts;
- a significant disruption in, or breach in security of our information technology systems and resultant interruptions in service and any related impact on our reputation;
- our ability to attract and retain qualified employees and key personnel;
- the effects of natural or man-made catastrophic events or public health emergencies;
- the effectiveness of our internal controls;
- changes in government regulation affecting our business;
- uncertainty as to economic and market conditions and the impact of adverse economic conditions; and
- other risk factors included under the section titled “Risk factors”.

You should not rely upon forward-looking statements as predictions of future events. Such statements are based on management's expectations as of the date of this filing and involve many risks and uncertainties that could cause our actual results, events or circumstances to differ materially from those expressed or implied in our forward-looking statements.

Readers are urged to carefully review and consider all of the information in this Form 10-K and in other documents we file from time to time with the Securities and Exchange Commission, or SEC. We undertake no obligation to update any forward-looking statements made in this Form 10-K to reflect events or circumstances after the date of this filing or to reflect new information or the occurrence of unanticipated events, except as required by law. We may not actually achieve the plans, intentions or expectations disclosed in our forward-looking statements. Our forward-looking statements do not reflect the potential impact of any future acquisitions, mergers, dispositions, joint ventures or investments we may make.

When we use the terms "Twist," "Twist Bioscience," the "Company," "we," "us" or "our" in this report, we are referring to Twist Bioscience Corporation and its consolidated subsidiaries unless the context requires otherwise. Sequence space and the Twist logo are trademarks of Twist Bioscience Corporation. All other company and product names may be trademarks of the respective companies with which they are associated.

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PART I

Item 1. *Business*

At Twist Bioscience Corporation, we work in service of our customers who are changing the world for the better. In fields such as health care, food/agriculture, industrial chemicals/materials, academic research and data storage, by using our products, our customers are developing ways to better lives and improve the sustainability of the planet. We believe Twist Bioscience is uniquely positioned to help accelerate their efforts and the faster our customers succeed, the better for all of us.

We have developed a disruptive DNA synthesis platform to industrialize the engineering of biology that provides DNA for a wide range of uses and markets. The core of our platform is a proprietary technology that pioneers a new method of manufacturing synthetic DNA by “writing” DNA on a silicon chip. We have miniaturized traditional chemical DNA synthesis reactions to write over 1,000,000 pieces of DNA (oligonucleotides) up to 500 bases through direct synthesis on each silicon chip, approximately the size of a large mobile phone, reducing by 99.8% the amount of chemicals we estimate would be used per gene as compared to plate-based synthesis. We have combined our silicon-based DNA writing technology with proprietary software, scalable commercial infrastructure and an e-commerce platform to create an integrated technology platform that enables us to achieve high levels of quality, precision, automation, and manufacturing throughput at a significantly lower cost and quicker than our competitors.

We have applied our unique technology to manufacture a broad range of synthetic DNA-based products, including synthetic genes, tools for next generation sequencing, or NGS, sample preparation, and antibody libraries for drug discovery and development, all designed to enable our customers to conduct research more efficiently and effectively. Leveraging our same platform, we have expanded our footprint beyond DNA synthesis to manufacture synthetic RNA as well as antibody proteins to disrupt and innovate within larger market opportunities, in addition to discovery partnerships for biologic drugs and developing completely new applications for synthetic DNA, such as digital data storage. We sell our products to a global customer base of approximately 3,562 customers across a broad range of industries.

We believe our products enable a broad range of applications that may ultimately improve health and the sustainability of the planet across multiple industries, including:

- healthcare for the identification, prevention, diagnosis and treatment of disease (antibody discovery and optimization technology);
- chemicals/materials for cost-effective and sustainable production of new and existing specialty chemicals and materials, such as spider silk, nylon, rubber, fragrances, food flavors and food additives;
- food/agriculture for more effective and sustainable crop production;
- academic research for a broad range of education and discovery applications; and
- technology for potential use as an alternative long-term data storage medium.

Background

We currently generate revenue through our synthetic biology and NGS tools product lines as well as biopharma services for antibody discovery, optimization and development. In addition, we are leveraging our platform to expand our portfolio to include other products and address additional market opportunities, including vertical market opportunities in digital data storage.

In fiscal year 2024, we served approximately 3,562 customers and reported $313.0 million in revenue, including $169.0 million in revenue from the healthcare sector, $83.5 million in revenue from the chemicals/materials sector, $58.5 million in revenue from the academic research sector and $2.1 million in revenue from the food/agriculture sector.

Our Markets

Synthetic Biology

Our synthetic biology products serve life sciences researchers across a variety of healthcare applications including drug discovery, disease detection, enzyme engineering, gene editing and basic academic research. In addition, our synthetic biology products are used for chemical and materials applications including development of synthetic spider silk, nylon, rubber, fragrances, flavors and food additives; for food and agricultural applications including improving crop traits such as adding vitamins or improving drought tolerance, and engineering bacteria to deliver nitrogen at the root of plants.

Synthetic DNA is the fundamental building block that allows researchers to engineer biology. Synthetic DNA is a foundational product enabling the entire bioeconomy, with synthetic biology alone expected to have a $2-4 trillion global impact by 2030-2040. The National Security Commission on Emerging Biotechnology recognized synthetic DNA as a critical choke point in many supply chains, making broad access important for many industries. Researchers at a wide range of institutions design synthetic DNA to regulate the production of proteins and other molecules to achieve a specific functional purpose. While synthetic DNA has been produced for more than 40 years, the complexities of biology and the production constraints inherent in legacy processes have historically limited the applications and market opportunities for DNA synthesis.

Next-Generation Sequencing

Our NGS tools play an integral role in the way our customers prepare their patient samples to be sequenced. NGS has transformed many markets in recent years by changing the landscape of diagnosing disease and disorders and offers a path to prevent or treat disease. Some of the markets impacted by NGS include oncology, reproductive health, food/agriculture, consumer genomics, infectious disease research and drug discovery. As NGS technology improves and the cost of sequencing declines, new emerging markets that were once considered impractical, such as population-scale sequencing, liquid biopsy (a test that detects multiple types of cancer from a single blood sample), minimal residual disease testing and single cell sequencing, have become major areas of interest and investment.

Historically, a significant constraint in many NGS applications has been the high cost and long turnaround time of oligonucleotide production. Highly accurate and reproducible oligonucleotide production is required to produce high quality target enrichment data. Traditionally, the lack of options for oligonucleotide production forced researchers to choose between using less precise methods or reducing the number of samples in their study. Twist's silicon-based platform synthesizes millions of oligonucleotides simultaneously with high uniformity and accuracy. Using highly uniform oligonucleotides ensures that the amount of oversampling needed to represent a dataset is kept to a minimum, meaning researchers can screen with confidence while reducing the down-stream sequencing costs.

The ability of the Twist DNA synthesis platform to precisely manufacture target enrichment probes at large scale has dramatically increased the types of projects that can now be addressed using NGS technologies. In addition to target enrichment, we have expanded our offerings to include innovative library preparation with Twist-developed enzymes, buffers, beads, unique dual indexes (UDIs), unique molecular identifiers (UMIs), adapters and more. Our platform has unlocked new applications, improved data quality, and dramatically expanded the types of scientific questions that can be answered using NGS. In addition, the speed of our DNA synthesis platform enables customers to quickly deploy NGS technologies to applications where the time to answer is critical.

Our Platform

We developed the Twist Bioscience DNA synthesis platform to address the limitations of throughput, scalability, and cost inherent in legacy DNA synthesis methods. Our platform stems from extensive analyses and improvements to the existing gene synthesis and assembly workflows. Our core technologies combine expertise in silicon, software, fluidics, chemistry, and motion and vision control to miniaturize thousands of parallel chemical reactions on silicon and write thousands of strands of DNA in parallel.

Our Products

We have developed multiple products derived from synthetic DNA and our versatile DNA synthesis technology. Our current offering consists of two primary product lines, synthetic biology tools and NGS tools, that address different needs of our customers across a variety of applications. In addition to DNA, we now offer RNA and protein products.

Synthetic Biology Products

Synthetic genes and gene fragments

Synthetic genes are manufactured strands of DNA. Customers (biotech, pharma, industrial chemical, agricultural companies as well as academic labs) order our synthetic genes to conduct a wide range of research, including product development for therapeutics, diagnostics, chemicals/materials, food/agriculture, data storage as well as a multitude of emerging applications within academic research. Virtually all research and development of this type requires trial and error, and our customers require many variations of genes to find the DNA sequence that achieves their objectives.

We offer two primary categories of synthetic genes: clonal genes of perfect quality delivered to the customer in a vehicle called a vector; and genes that customers can place in their own vector, non-clonal genes or fragments. Within these two categories, customers can order different lengths of DNA depending on their required final gene construct. Customers can order longer genes or shorter genes and can stitch genes together to create longer or shorter constructs if desired.

Currently, we manufacture genes of up to 5,000 base pairs in length, yielding a clonally perfect piece of DNA that our customers can immediately use for their research. We offer non-clonal genes of up to 5,000 base pairs in length, which we believe addresses the vast majority of demand for non-clonal genes. We also offer larger quantities of DNA for customers who require it for their development efforts. Our error rate for gene fragments is 1:7500 nucleotides.

In November 2023, we introduced Express Genes, a product line that offers customers the same perfect-quality clonal genes at a turnaround time of 5 business days. We charge a premium for this fast turnaround time. We make all genes and gene fragments on our Express timeline.

In fiscal year 2024, we expanded our Express product portfolio to include many other products offered including Multiplexed Gene Fragments on a fast turnaround timeline. Our ability to provide this rapid turnaround for products at scale differentiates us from our competitors.

Oligonucleotide, or Oligo pools

Oligo pools, or high diversity collections of oligonucleotides, are utilized in many applications, including targeted NGS, CRISPR gene editing, mutagenesis experiments, DNA origami (the nanoscale folding of DNA to create two- and three-dimensional shapes at the nanoscale), DNA computing and data storage in DNA, among others. Our oligo pools are also used for high-throughput reporter assays that are used to study cell signaling pathways, gene regulation, and the structure of cell regulatory elements. For these applications, we provide customers with accurate and uniform synthetic oligos to precisely match their required designs.

We sell a diverse, customizable set of oligo pools, ranging from a few hundred oligos to over one million, and offer oligonucleotides of up to 500 nucleotides in length, with an error rate of 1:3000 nucleotides. In fiscal year 2024 we added an offering of cloned oligo pools to further enable researchers.

IgG proteins

Pairing the automation in our synthetic biology platform along with our expertise in antibody discovery, we introduced an immunoglobulin G (IgG) protein offering for our customers focused on the pursuit of drug discovery and development. In the process of antibody discovery, antibody fragments (Fab, small chain fragment variable (scFv) or VHH) must be reformatted to full IgGs. Leveraging our silicon-based synthesis platform, we provide customers with a high throughput IgG capability, removing this bottleneck from the antibody discovery process. We offer standard and Express turnaround times in both CHO and HEK293 cell lines.

NGS tools

Building from our DNA synthesis platform, we have developed products to enable next-generation sequencing. Our products work on multiple sequencing platforms as we are sequencer agnostic. In particular, we are focused on addressing the demand for better sample preparation products that improve sequencing workflow, increase sequencing accuracy, and reduce downstream sequencing costs. Using our silicon-based DNA synthesis platform, we are able to synthesize exact

sequences of interest. In the target enrichment process, our synthetic DNA probes bind to the sequence of interest within the sample, acting like a magnet to isolate and physically extract the targeted segment of DNA.

Our NGS products are primarily used within diagnostic tests for various indications including rare disease, SARS-CoV-2 and cancer through liquid biopsy and minimal residual disease (MRD). In addition, customers use our NGS tools for population genetics research and biomarker discovery, translational research, microbiology and applied markets research. Our customers are primarily diagnostic companies and hospitals, research institutions, agricultural biotechnology companies, and consumer genetics companies conducting diagnostic tests for a wide range of applications.

In fiscal year 2024, we added several innovative library preparation products for specific applications, leveraging our unique ability to develop proprietary enzymes for use within the workflows.

We offer a wide variety of NGS tools for our customers including library preparation kits, human exome kits, fixed and custom panels as well as Alliance panels. Alliance panels are customer-curated content sold through Twist. In addition, we offer specific workflow solutions including a methylation detection kit for cancer, rare and inherited disease study, as well as a fast hybridization solution (FastHyb), which allows researchers to go from sample to sequencer in a single day. In addition to NGS tools for DNA workflows, we offer full RNA sequencing workflows.

Synthetic controls

Leveraging our DNA synthesis platform, we offer positive synthetic controls that provide quality control measures for a wide range of applications from assay development to routine testing of samples with both next-generation sequencing (NGS) and reverse transcription polymerase chain reaction (RT-PCR) assays.

Drug and Target Discovery Solutions

Precision DNA libraries

Our platform allows customers to customize every antibody sequence variation and construct a precise library systematically to target the entire region of interest. We can create single-site libraries in which we change a single amino acid (which is encoded by a group of three DNA nucleobases) within the sequence or single-site saturation libraries in which we change every amino acid within the sequence for a more comprehensive approach. We can also generate combinatorial libraries in which we introduce changes to multiple sites within the same gene in specific ratios and combinations. These libraries can be used for antibody engineering, affinity maturation, and humanization, which simplifies downstream screening and identifies more lead molecules. Our libraries are explicitly developed for a specific area of the genome or tailored to a specific disease, with antibody compounds evenly represented across all desired areas of the genome.

Biopharma Services

Modern therapeutic targets are increasing in complexity and traditional, single modality platforms are no longer sufficient on their own. Our biopharma services group offers the “discovery trifecta” – in vivo, in vitro and in silico antibody discovery all under one roof. We provide comprehensive discovery services for our partners that results in improved diversity, improved screening, ultra fast lead selection and engineering, which can mean a faster path in the race to the clinic.

Partnerships with leading companies

We believe we have several avenues available to monetize our antibody discovery program. In general, partnerships for our antibody development platform require us to provide rapid, on-demand (high affinity) antibodies based on one or more targets provided by the customer.

Customers can design and purchase libraries, and we work with partners that bring us a target, to discover antibody leads against that target. These partnerships generate revenue in up-front fees, through the license of libraries and service revenue. In addition, many of our partnerships include success-based milestones for key clinical, regulatory and commercial achievements and/or royalties on any product sales resulting from our collaboration.

To date, we have generated antibody leads to multiple biological targets and these antibody leads are in various stages of early discovery and development.

As of September 30, 2024, we had signed 365 revenue-generating partnerships. Through these partnerships, we had 955 completed programs and 89 active programs with 73 of the programs including milestones and/or royalties as of

September 30, 2024. Some of our partners include Bayer, Boehringer Ingelheim GmbH, Takeda Pharmaceutical Company Limited, Adicet Bio, Ono Pharmaceutical Ltd., Kyowa Kirin, Invetx, Inc., Astellas Pharma Inc. and Neogene Therapeutics, Inc.

In October 2024, we entered into an agreement with XOMA Royalty under which they paid Twist $15 million cash in exchange for 50% of future milestone and royalty payments from our existing collaborations as of the date of signing. We retain all upfront, service and other revenue earned under antibody discovery and biopharma solutions agreements as well as half of future milestones and royalties.

Our growth strategy

Our objective is to be the leading provider of synthetic DNA and DNA-based products worldwide and to leverage our platform to build a leadership position in other life sciences markets in which we have a competitive advantage. We intend to accomplish this objective by executing on the following:

- maintain and expand our position as the provider of choice for high-quality, affordable synthetic DNA, RNA and proteins to customers across multiple industries;
- become a leading supplier of NGS sample preparation products;
- conduct biopharma services for our current customers and future partners;
- continue to develop commercial solution for storing digital data in DNA; and
- expand our global presence.

Beyond these opportunities, we are working with industry partners to create new markets for our products by leveraging our platform.

Sales and marketing

We have built a versatile and scalable commercial platform that enables us to reach a diverse customer base that we estimate consists of over 100,000 synthetic DNA users, potential customers of our NGS tools products and partners who may use our services for antibody discovery. In order to address this diverse customer base, we employ a multi-channel strategy comprised of a direct sales force targeting synthetic DNA customers, a direct sales force focusing on the NGS market and an e-commerce platform that serves both commercial channels. We employ business development and sales representatives for our biopharma solutions as well. Our sales force is focused on customer acquisition, support, and management across industries, and is highly trained on both the technical aspects of our platform and how our product and services can be used in a wide range of industries. Our easy-to-use e-commerce platform allows customers to design, validate, and place on-demand orders of customized DNA online, and enables them to receive real-time customized quotes for their products and track their order status through the manufacturing and delivery process. This is a critical part of our strategy to address our large markets and diverse customer base, as well as drive commercial productivity, enhance the customer experience, and promote loyalty.

We sell our products through a worldwide commercial organization that includes direct sales personnel, commercial consultants in Europe and Asia, an e-commerce platform and distributors. As of September 30, 2024, we employed 236 employees and dedicated commercial consultants in sales, marketing and customer support.

Research and development

We are engaged in ongoing research and development efforts focused on enhancements to existing products and the development of new products. Currently, we are pursuing research and development projects with respect to the following:

- process development for highest quality oligos;
- develop proprietary enzymes to optimize SynBio and NGS products and workflows;
- silicon process and enzymatic chemistry development for our data storage initiative;
- evaluate and implement AI applications to potentially optimize services for our customers;

- expansion of our product offerings for oligo, gene, synthetic controls, NGS library preparation and target enrichment, and DNA Libraries products;
- continuous process improvements across the business to facilitate speed, efficiency and automation; and,
- develop new products including mRNA and proteins.

Research and development activities are conducted in collaboration with manufacturing activities to help expedite new products from the development phase to manufacturing and to more quickly implement new process technologies. From time to time, our research and development efforts have included participation in technology collaborations with universities and research institutions.

As of September 30, 2024, we employed 182 people in our research and development team.

Patents and other intellectual property rights

Worldwide, we own or exclusively in-license over 150 issued or allowed patents and more than 250 pending patent applications as of September 30, 2024. In addition to these owned and exclusively licensed patents and pending patent applications, we also license patents on a non-exclusive and/or territory restricted basis. Our intellectual property portfolio includes important patents and patent applications directed to DNA synthesis, next generation sequencing, antibody libraries, and DNA data storage. Our policy is to file patent applications to protect technology, inventions and add improvements that are important to our business. Individual patent terms extend for varying periods of time, depending upon the date of filing of the patent application, the date of patent issuance, and the legal term of patents in the countries in which they are obtained.

Manufacturing and facilities

The production of our products is a highly complex and precise process. We currently manufacture all of our products and multiple sub-assemblies at our manufacturing facilities in South San Francisco, California and Wilsonville, Oregon. We consider our long-lived assets to be ready for their intended use when they are first capable of producing a unit of product that is saleable at which point depreciation of the asset commences. We also outsource some of our sub-assemblies to third party manufacturers. All of our products originate from synthetic DNA obtained from nanostructured clusters fabricated on our proprietary silicon technology platform. Due to its on-demand nature, the gene synthesis business requires manufacturing operations to be in operation 24 hours a day, seven days a week, 365 days per year. For synthetic genes, we have built a highly scalable gene production process with what we believe is industry-leading capacity to address the growing demand of scalable, high-quality, affordable synthetic genes. As of September 30, 2024, we employed 357 people in our manufacturing and operations team.

In addition to synthetic genes, we manufacture oligo pools. The pooling process has been fully automated through a mixture of custom proprietary and over-the-counter liquid handling equipment. We have the capacity to make many millions of high-quality oligos per day that can be used to make genes and gene fragments of various lengths, oligo pools of various sizes, DNA libraries and NGS tools products. We intend to increase our shipments to leverage our production capacity through our e-commerce platform, and express offerings, which we believe will expand both our market opportunity and our customer base.

The manufacturing process for our NGS tools is highly flexible given the efficiency of our production capability. We have automated the entire workflow using proprietary and over-the-counter laboratory equipment. We have built dedicated production capabilities for our NGS products.

ISO certification

Medical device manufacturers implement a Quality Management System (QMS) for medical devices to ensure that their products consistently meet regulatory requirements and customer expectations. Implementing a QMS for medical devices is crucial for ensuring patient safety, regulatory compliance, and the overall effectiveness and reliability of medical devices in the market. The international standard ISO 13485 is widely recognized and provides a framework for developing and maintaining a QMS specific to the medical device industry. We certified our QMS to the ISO 9001:2015 (Quality Management Systems—Requirements) standard and ISO 13485:2016 standard (Medical devices—Quality management systems—Requirements for regulatory purposes). ISO is a global network of national standards with over 18,000 standards for nearly every aspect of technology and business. ISO has standard bodies in 163 countries. ISO Surveillance Audits are carried out twice within a three-year period by the registrar (certification body) to ensure we maintain our system in compliance with ISO standards. Recertification is required every three years and we have been successfully recertified since obtaining our original ISO certification.

In 2020, our QMS for manufacturing our NGS Target Enrichment Panels in our South San Francisco, and subsequently in 2023 our Wilsonville manufacturing facilities was certified to ISO 13485:2016.

Supply chain

We have historically purchased many of the components and raw materials used in our products from numerous suppliers worldwide. For reasons of quality assurance, sole source availability or cost effectiveness, certain components and raw materials used in the manufacture of our products are available only from one supplier. We have worked closely with our suppliers to develop contingency plans to assure continuity of supply while maintaining high quality and reliability, and in some cases, we have established long-term supply contracts with our suppliers. We qualify additional suppliers for key materials in an effort to ensure continuity of supply for our operations.

Competition

The synthetic biology industry is intensely competitive and is characterized by price competition, technological change, international competition, product turnaround time and manufacturing yield problems. The competitive factors in the market for our products include:

- price;
- product quality, reliability and accuracy;
- product offerings & complexity;
- turnaround time;
- breadth of product line;
- design and introduction of new products;
- market acceptance of our products and those of our customers;
- throughput and scale; and
- technical support and service.

We face competition from a broad range of providers of synthetic biology products such as GenScript Biotech Corporation, DNA Script, Inc., GENEWIZ (owned by Azenta), Integrated DNA Technologies, Inc. (owned by Danaher Corporation), DNA 2.0 Inc. d/b/a/ ATUM, GeneArt (owned by Thermo Fisher Scientific Inc.), Eurofins Genomics LLC, Promega Corporation, OriGene Technologies, Inc., Blue Heron Biotech, LLC, Elegen and others. Additionally, we compete with both large and emerging providers in the life sciences tools and diagnostics industries focused on sample preparation for NGS such as Thermo Fisher Scientific Inc., Illumina, Inc., Integrated DNA Technologies, Inc., Roche, New England Biolabs and Agilent. In the antibody discovery market, we compete with contract research organizations including Curia, GenScript, and Genovac (formerly part of Aldevron, LLC), and antibody discovery biotechnology companies, such as Fair Journey/Iontas, Adimab, Distributed Bio (owned by Charles River), Ablexis, Specifica, OmniAb and AbCellera Biologics Inc. In the emerging field of DNA digital data storage, we compete with Biomemory, Catalog Technologies, Inc., GenScript, various academic institutions, and other emerging competitors.

Corporate Responsibility

We are at the forefront of the bioeconomy revolution, and our products are increasingly being used to empower our customers, which consist of diagnostic, therapeutic and healthcare companies, agricultural biotech companies, chemical companies, academic institutions and government entities, around the world to address large societal challenges. All of our work supports our mission to provide synthetic DNA and DNA products to improve health and sustainability.

Full results from our Corporate Responsibility efforts, including our 2024 Corporate Responsibility Report can be found here: https://www.twistbioscience.com/company/corporate-responsibility. The information on our website, including, without limitation, in the 2024 Corporate Responsibility Report, should not be deemed incorporated by reference into this annual report or otherwise “filed” for purposes of Section 18 of the Securities Exchange Act of 1934, as amended, or otherwise subject to the liabilities of that section.

Human Capital

Our employees are a key factor in our ability to serve our customers. The ability to hire and retain highly skilled professionals remains key to our success in the marketplace. To attract, develop and motivate our employees, we offer a challenging work environment, ongoing skills development initiatives, attractive career advancement, opportunities and a culture that rewards entrepreneurial initiative and exceptional execution.

Our guiding principles of grit, impact, service and trust serve as the foundation of our culture. Our guiding principles set the tone for how we work together, provide a framework for giving feedback and increase the power of our brand. Service is at the core of our business and our interactions with one another. We relentlessly focus on exceeding internal and external customer needs.

Employee population

As of September 30, 2024, we had 923 employees. Of these employees, 182 were primarily engaged in research and development activities; 236 were primarily engaged in marketing, sales and customer support; 148 were primarily engaged in general and administrative activities; and 357 were primarily engaged in operations and manufacturing, dedicated to manufacturing our synthetic genes, oligo pools, NGS tools and DNA libraries. None of our employees is represented by a labor union, and we consider our employee relations to be good.

Recruiting, Development and Retention

Recruiting

We believe that our employees are our most important asset. Beginning with the pre-recruitment process, we provide internship opportunities in both scientific and non-scientific fields for students interested in biotechnology and the science, technology, engineering and mathematics (STEM) careers. We engage with local communities to provide expert speakers sharing nontraditional career pathways for the biotechnology field. We partner with community colleges and Hispanic Serving Institutions to build our brand within diverse communities as a source of diverse, high-quality candidates for every role with the goal of identifying the best possible candidate to fill open positions within the Company.

We actively engage with future scientists through organizations including the International Genetically Engineered Machine (iGEM), a non-profit organization dedicated to furthering the field of synthetic biology. In addition, we have provided internships through the Gloucester Biotechnology Academy, a hands-on training program that prepares students for careers as entry-level technicians in cutting-edge laboratories; and Eastside Preparatory Academy, a high school dedicated to serving students historically underrepresented in higher education. We have engaged with several organizations in the Portland area including Portland Community College, Partnerships in Diversity, Oregon State University, Oregon Bioscience Association and others. Twist Bioscience is a committed partner with the Oregon Bioscience Association in the implementation of a successful bio apprenticeship program in Oregon that provides access and support for Oregon's priority populations, builds equity into economic strategies for the bioscience industry, and addresses the critical talent needs of our industry.

With an active program in place for our employees, we are striving to further support our female and underrepresented employees in advancing their careers while continuing to focus on hiring diverse talent, particularly at more senior positions.

Growth and development

We invest significant financial and support resources to develop the talent we need to remain at the cutting edge of innovation to ensure Twist Bioscience is an employer of choice. Our performance management system is aimed at supporting our culture, maintaining consistency with our guiding principles and to focusing on continuous learning and development. Our success in the market depends on employees understanding and embracing how their job contributes to the Company's overall strategy. We encourage cross team communication as well as integrated departmental communication. We believe this broadens our employee's skill set and provides opportunity for growth and advancement. We invest in our next generation of leaders through a six-month leadership program and individualized coaching for mid-level managers. In addition, we offer tuition reimbursement aimed at growth and career development.

We have made a significant investment in an online learning platform with on-demand, video-based content. Employees have the opportunity to refine or develop professional skills, learn new software, and explore as they plan their career growth. The platform also offers tremendous potential for managers and employees to create development plans as part of the performance review process.

Compensation and benefits, health and wellness

We strive to provide pay, comprehensive benefits and services that help meet the varying needs of our employees. Our generous total rewards package includes above-market pay; fully covered healthcare benefits for employees, with family member healthcare benefits covered at 90%; a health savings account for individuals and their families; approximately four weeks of paid vacation; a minimum of sixteen weeks of parental leave for all employees globally; flexible work schedules; and onsite services including gym and one meal daily. In addition, we offer full-time employees, both exempt and non-exempt, the benefit of equity ownership in the Company through restricted stock units (RSU) grants and/or our employee stock purchase plan.

We have an expert-built educational platform to assist employee's fertility & family building needs with information about treatment, fostering or adopting, plus dedicated resources for egg freezers, egg donation, LGBTQIA+ families, and solo parents.

We have increased our well-being benefits, by offering programs that help workers monitor and reduce their stress levels, providing apps to support sleep and relaxation. We have further addressed employees' emotional health and well-being by providing meditation sessions and using telehealth programs to offer mental health counseling.

Diversity, equity, inclusion and belonging

Diversity is in our DNA all the way from the top of the organization down to the individual employee. Our board adopted a Board Diversity Statement in January 2022 to provide informed decisions on diversity, equity and inclusion. Our employees come from numerous countries and bring diversity to our workplace across many critical categories. We believe our Company is stronger because of the variety of experiences and backgrounds our employees bring to their work every day. Among our employees, 55% identify as people of color.

We are committed to creating and maintaining a diverse, inclusive and safe work environment where our employees can bring their best selves to work each day. Our commitment to diversity extends through our recruitment, retention, learning and engagement and community partnerships. As part of our diversity, equity, inclusion and belonging strategy, we made an active decision to pursue opportunities for learning and engagement that bring people from different backgrounds together into conversation. We have initiated monthly Culture Conversations where we explore identities and systems of power using an intersectional lens each month. Past topics include: disability, LGBTQIA+, ageism, Latin identity, and more. Our objective is to appreciate each other as individuals with unique lived experiences, rather than define one another by a single trait such as race, sexual orientation or geographical location. To assess our efforts toward building a diverse workforce, we have included questions in our engagement survey to measure employee perception of inclusive culture.

In addition, we mandate training for all employees and managers to prevent workplace and sexual harassment. The course equips leaders and employees with the tools they need to identify and address unwelcome conduct in non-adversarial, respectful terms.

Employee health and safety

We remain steadfast in our commitment to promote the health and safety of our employees and have implemented a robust Injury and Illness Prevention Program (IIPP). We require annual workplace safety training to reinforce workplace safety procedures that may be useful in the event of emergency situations and to assist our employees in helping to prevent workplace accidents. Our Employee Safety Committee, which is comprised of numerous cross-departmental members, meets on a regular basis (at least quarterly) to review workplace safety and adherence to safety policies. As part of our efforts, all employees and managers complete workplace harassment and sexual harassment training that includes details on how to report any violation of these policies.

Conduct and ethics

Our Board of Directors adopted and regularly reviews the Code of Business Conduct and Ethics Policy (the "Code of Ethics"), which applies to all of our employees, directors and officers. We believe it is imperative that the board of directors and senior management strongly support a no-tolerance stance for workplace harassment, biases and unethical behavior. All employees are required to abide by, review and confirm compliance to the Company's Code of Ethics, our Anti-Money Laundering Policy, our Anti-Corruption Policy. We also maintain a Modern Slavery Act Statement and our Supplier Code of Conduct. We have established a reporting hotline and email address that enables employees to anonymously report any suspected violations of the Code of Ethics.

In addition, because synthetic DNA is considered to be a dual use technology, we invest substantial financial and human resources in biosecurity to help ensure that our products are used for responsible research. We endeavor to abide by all local, national and international regulations as well as trade compliance requirements and are an active member of the

International Gene Synthesis Consortium and the Australia Group. We maintain an active relationship with the governing body for synthetic DNA within the U.S. Department of Homeland Security.

Employee communications and engagement

We employ a variety of tools to facilitate open and direct communication including open forums with executives, employee surveys and engagement through focus groups, forums and committees. We endeavor to further refine our employee programs through our employee engagement survey as well as follow up quarterly pulse surveys. Based on a recent survey conducted in February 2024 where 91% of our employees responded:

- 89% of employees understand Twist's mission
- 86% understand how they contribute to the mission of the Company
- 88% understand how their goals contribute to Twist

We hold All Employee meetings twice per month as well as a monthly managers meeting for all people managers.

Community engagement, social and relationship capital

We are endeavoring to develop relationships, give back to our communities and engage in corporate social responsibility and sustainability initiatives. We provide all employees with eight fully paid hours each year to give back to the community at an organization of their choice. We are working to engage with the local community organizations to provide volunteer opportunities for our employees.

Environmental management

Many gene synthesis companies rely on oligonucleotide, or oligo (short pieces of DNA) synthesis on a plastic 96-well plate format. The 96-well plate allows researchers to create 96 oligos in parallel, one in each well. While this process can successfully achieve DNA synthesis, it requires high volumes of phosphoramidites, an expensive raw material, as well as other ancillary chemical reagents such as activator, wash, deblock, oxidizer and capping reagents, many of which are toxic and environmentally harmful. The reagent consumption levels vary depending on the DNA synthesizer and its setup.

At Twist, we developed an ultra-high-throughput DNA synthesis platform to address the limitations of throughput, scalability, and cost inherent in legacy DNA synthesis methods like that described above. With a footprint that is similar to the size of a 96-well plate that produces 96 oligos or 1 or 2 genes, we are able to produce approximately 1,000,000 oligos or 9,600 genes in parallel. Furthermore, we have calculated the carbon footprint of the Twist DNA synthesis method and compared it to the carbon footprint of the 96-well plate DNA synthesis process. The difference is significant. Twist Bioscience's emissions from manufacturing one gene is a minuscule 36 grams of CO_2e, while the 96-well plate process has a carbon footprint of 23 kilograms of CO_2e per gene.

With the Twist ultra-high-throughput DNA synthesizer, we believe we are able to achieve at least a 99.8% volume reduction (when compared to a standard manufacturer of oligos) in chemical consumption compared to legacy oligo synthesis. For the more expensive chemical reagents (e.g., phosphoramidite and activator reagents), we have achieved nearly a 1,000,000-fold volume reduction. This drastic volume reduction is achieved through various engineering breakthroughs, including using of inkjet printing to deliver phosphoramidites and activator reagents (10 picoliter per droplet), and the development of proprietary flow cell chambers and reagent recipes, among other proprietary developments.

In addition, the legacy oligo synthesis process often produces significantly more oligos than is typically required for most subsequent processes. In contrast, the Twist system includes a fully-integrated and miniaturized molecular biology workflow to assemble genes using nearly 100% of the oligos we produced, yielding nearly zero wasted synthesized oligos and reducing the usage of molecular biology reagents (e.g., polymerase and other enzymes, and dNTP).

Overall, Twist's process to synthesize DNA significantly reduces the quantity of chemicals used, overproduced product and waste, for a more sustainable production process.

Government regulation

Twist Bioscience is a leading provider of synthetic DNA products, serving customers across research, development, and commercial applications. We offer a wide range of products intended for "Research Use Only" (RUO) as well as a limited catalog of NGS tools that have been CE-marked pursuant to, and regulated by, the In Vitro Diagnostic Device Regulation (EU) 2017/746, or IVDR, and sold as in-vitro diagnostic medical devices (IVDs) in the European market. Our RUO

products are sold and promoted for non-diagnostic and non-clinical purposes to academic institutions, life sciences and research laboratories, and biopharmaceutical and biotechnology companies who then integrate our products into their workflows for further commercialization. These products serve as vital research tools, enabling our customers to develop a diverse spectrum of commercial products. However, if we expand our portfolio of IVDs , we may be subject to a variety of specialized regulatory requirements, including those set forth by the U.S. Food and Drug Administration, or the FDA in the United States and the IVDR in the European Union.

Aside from certain labeling requirements, we believe that most of our products, as currently marketed, are largely unregulated by governmental bodies, including the FDA. Even so, we recognize that the applications of synthetic biology are rapidly evolving and we are actively involved in supporting our customers who are developing regulated products, including through contract manufacturing and specialized packaging solutions. As such, we may be subject to certain regulatory requirements, directly or indirectly, and maintain a robust quality management system to ensure compliance. Furthermore, if we expand our own portfolio of IVDs, we anticipate further engagement with regulatory bodies such as the FDA. We are committed to navigating this evolving landscape and ensuring that our products and services meet the highest quality and regulatory standards. For example, we have been recently evaluated by an external third party who has determined that we have processes in place to support compliance with current Good Manufacturing Practices (cGMP) and to support the required regulatory requirements as future regulations are updated by the FDA. Currently, our quality management system adheres to ISO 13485:2016 to ensure the quality and reliability of our products.

RUO is a term applicable to our target enrichment products for the next-generation sequencing (NGS) market and is applied to kits sold to this market segment. It is intended to restrict use of the kits to non-in vitro diagnostic purposes. Our NGS target enrichment and library preparation products are used in a more comprehensive workflow for next generation sequencing for research purposes only. In the future, we may develop this larger workflow as an in vitro diagnostic, for which we will obtain prior authorization from FDA or other applicable regulatory authorities before commercialization. For example, we launched a limited line of IVDs that are CE-marked and IVDR compliant to support our European customers who are in the in vitro diagnostic medical device market.

FDA

Pursuant to its authority under the Federal Food, Drug, and Cosmetic Act, or the FDC Act, the FDA has jurisdiction over medical devices. The FDA regulates, among other things, the research, testing, manufacturing, safety, labeling, storage, recordkeeping, premarket clearance or approval, marketing and promotion and sales and distribution of medical devices in the United States to ensure that medical products distributed domestically are not adulterated and are safe and effective for their intended uses. In addition, the FDA regulates the import and export of medical devices.

Medical device regulation in general

The FDC Act classifies medical devices into one of three categories based on the risks associated with the device and the level of control necessary to provide reasonable assurance of safety and effectiveness. Devices deemed by the FDA to pose the greatest risk, such as life-sustaining, life-supporting or implantable devices, or devices deemed not substantially equivalent to previously 510(k) cleared devices are generally categorized as Class III. These devices typically require submission and approval of a Premarket Approval Application, or PMA. However, FDA can reclassify or use “de novo classification” for a device that meets the FDC Act standards for a class II or III device, which still requires PMA approval. Devices deemed to pose lower risk are categorized as either Class I or II. Class II classification usually requires the manufacturer to submit to the FDA a premarket notification submission requesting clearance of the device for commercial distribution in the United States pursuant to Section 510(k) of the FDC Act, referred to as 510(k) clearance. Most Class I devices are exempt from this requirement, as are some lower risk Class II devices with no established special controls. For devices requiring special controls, and when a 510(k) is required, the manufacturer must submit to the FDA a premarket notification submission demonstrating that the device is “substantially equivalent” to: (i) a device that was legally marketed prior to May 28, 1976, for which PMA approval is not required, (ii) a legally marketed device that has been reclassified from Class III to Class II or Class I, (iii) another legally marketed, similar device that has been cleared through the 510(k) process, or (iv) a device that was granted marketing authorization via the De Novo classification process under section 513(f)(2) of the FDC Act that is not exempt from premarket notification requirements.

Both Class II and III devices may require clinical studies. All clinical studies of investigational medical devices to determine safety and effectiveness must be conducted in accordance with FDA’s investigational device exemption (IDE) regulations, including the requirement for the study sponsor to submit an IDE application to FDA, unless exempt, which must become effective prior to commencing human clinical studies. PMA reviews generally last between three months and two years, although they can take longer. The PMA and 510(k) review processes can be expensive and lengthy and may not result in clearance (for Class I and II devices) or approval (for Class III devices). If we are required to submit our products for pre-market review by the FDA, we may be required to delay marketing and commercialization while we

obtain premarket clearance or approval from the FDA. There would be no assurance that we could ever obtain such clearance or approval.

All medical devices, including in vitro diagnostics, or IVDs, that are regulated by the FDA are also subject to the Quality System Regulation. Obtaining the requisite regulatory approvals, including the FDA quality system inspections that are required for PMA approval, can be expensive, may involve delay, and could conclude without products being approved by the FDA. Changes to the current regulatory framework, including the imposition of additional or new regulations, could arise at any time during the development or marketing of our products. This may negatively affect our ability to obtain or maintain FDA or comparable regulatory clearance or approval of our products in the future.

IVDs are a category of medical devices that include reagents, instruments, and systems intended for use in diagnosis of disease or other conditions, including a determination of the state of health, in order to cure, mitigate, treat, or prevent disease or its sequelae. IVDs are intended for use in the collection, preparation, and examination of specimens taken from the human body. An RUO IVD product is an IVD product that is in the laboratory research phase of development or is intended for use in the conduct of nonclinical laboratory research and not intended to produce results for clinical use. As such, an RUO IVD is not intended for use in clinical investigations or in clinical practice. Such RUO products do not require premarket clearance or approval from the FDA, provided that they be labeled “For Research Use Only. Not For Use In Diagnostic Procedures” pursuant to FDA regulations or they may be considered to be adulterated and misbranded.

As noted above, although our products are currently intended for research purposes only, the regulatory requirements related to marketing, selling, and supporting such products could be uncertain and depend on the totality of circumstances. This uncertainty exists even if a use by our customers occurs without our consent. If the FDA or other regulatory authorities assert that any of our RUO products are subject to regulatory clearance or approval, our business, financial condition, or results of operations could be adversely affected.

According to the FDA, including the RUO labeling statement will not necessarily render the device exempt from FDA premarket clearance, approval, or other regulatory requirements if the totality of circumstances surrounding the distribution of the product indicate that the manufacturer intended its IVDs for diagnostic use. Such circumstances may include, but are not limited to, the product’s advertising, labeling, or promotion, or the manufacturer’s assistance of a clinical laboratory in validating or verifying a test that incorporates products labeled RUO. This uncertainty exists even if such use by our customers occurs without our consent. If the FDA or other regulatory authorities assert that any of our RUO products are subject to regulatory clearance or approval, our business, financial condition, or results of operations could be adversely affected.

Some of our customers may use our products in their own laboratory-developed tests, or LDTs. The FDA has historically taken the position that LDTs are considered to be IVDs, but has generally exercised enforcement discretion. On May 6, 2024, the FDA published a final rule that (1) makes explicit that IVDs are devices under the Federal Food, Drug, and Cosmetic Act (FD&C Act), including when the manufacturer of the IVD is a laboratory, and (2) finalizes a policy under which the FDA will provide greater oversight of IVDs offered as LDTs through a phaseout of its general enforcement discretion approach for LDTs over the course of four years (the “LDT Final Rule”). This increase of regulatory requirements pursuant to the LDT Final Rule may influence the sales of our products and how customers employ our products, and we could be subject to additional regulatory controls, including enforcement action, administrative and judicial sanctions, all of which could adversely affect our business, financial condition, or results of operations. Whether the LDT Final Rule and the phaseout of FDA’s enforcement discretion will be fully implemented, however, is in question. The LDT Final Rule is receiving Congressional scrutiny, and there are currently two consolidated cases pending in the United States District Court for the Eastern District of Texas brought by, inter alia, the American Clinical Laboratories Association and the Association for Molecular Pathology against FDA, et al., alleging that the LDT Final Rule violates the Administrative Procedure Act.

EU Regulation

In the European Union (EU), the new In Vitro Diagnostic Device Regulation (EU) 2017/746, or IVDR, imposes stricter requirements for the marketing and sale of applicable medical devices, including in the area of clinical evaluation requirements, quality systems and post-market surveillance. Some of the IVDR requirements such as general safety and performance requirements became effective in May 2022 while the complete enforcement of the entirety of IVDR will not happen until May 2028. We likely will be impacted by this new regulation, either directly as a manufacturer of IVDs, or indirectly as a supplier to customers who are placing IVDs in the EU market for clinical or diagnostic use. In February 2024, we introduced IVDR-compliant Precision Dx products for whole exome sequencing to meet the needs of our European customers and demonstrate our commitment to providing compliant solutions for clinical and diagnostic use in the EU.

FSAP

The Centers for Disease Control and Prevention (CDC) and the Animal and Plant Health Inspection Service (APHIS) administer requirements of the Federal Select Agent Program, or FSAP. FSAP requirements govern possession, use, and transfer of select agents and toxins consisting of biological materials that have the potential to pose a severe threat to public, animal or plant health or to animal or plant products. The FSAP currently lists approximately 68 select agents and toxins. The registered entities primarily consist of academic, federal and non-federal government, commercial, and private facilities that conduct research studies or diagnostic activities. We are not a registered entity under FSAP and it is our policy generally not to produce or otherwise work with any biological material that is subject to FSAP license requirements. To the extent that we may possess, use, or transfer any material considered a select agent or toxin under FSAP prospectively, we would seek to register with FSAP and obtain all necessary permits for possession, transfer, importation, or any other regulated activity.

Export controls

Some sequences and synthetic controls we produce may be subject to licensing requirements for export outside of the United States under the U.S. Export Administration Regulations (EAR). Given the evolving nature of our industry, legislative bodies or regulatory authorities may adopt additional regulation or expand existing regulation to include our service. Changes to the current regulatory framework, including the imposition of additional or new regulations, could arise at any time, and we may be unable to obtain or maintain comparable regulatory approval or clearance of our service, if required. These regulations and restrictions may materially and adversely affect our business, financial condition, and results of operations.

OSTP framework for nucleic acid synthesis screening

The Office of Science and Technology Policy in 2024 published the Framework for Nucleic Acid Synthesis Screening. The Framework requires that U.S.-funded researchers and institutions limit the purchase of synthetic nucleic acids only to companies that publicly attest to adherence to the screening requirements of the Framework. Twist's biosecurity practices satisfy or exceed the requirements of the Framework and, as such, Twist has publicly attested to our adherence. We have also agreed, as required by the Framework, to amend our attestation within 72 hours should the status of our adherence to the Framework change.

Available information

Our corporate website address is *www.twistbioscience.com*. We use the investor relations page of our website for purposes of compliance with Regulation FD and as a routine channel for distribution of important information, including news releases, analyst presentations, financial information and corporate governance practices. Our filings with the SEC are posted on our website and available free of charge as soon as reasonably practical after they are electronically filed with, or furnished to, the SEC. The SEC's website, *www.sec.gov*, contains reports, proxy statements and other information regarding issuers that file electronically with the SEC. The content on any website referred to in this Form 10-K is not incorporated by reference in this Form 10-K unless expressly noted. Further, the Company's references to website URLs are intended to be inactive textual references only.

Item 1A. ***Risk factors***

Risk Factor Summary

Investing in our common stock involves a high degree of risk. You should carefully consider all information in the Annual Report on Form 10-K and in subsequent reports we file with SEC prior to investing in our common stock. These risks are discussed more fully in the section titled "Risk factors." These risks and uncertainties include, but are not limited to, the following:

- We have incurred net losses in every period to date, and we expect to continue to incur significant losses as we develop our business and may never achieve profitability;
- We may require additional financing to achieve our goals, and a failure to obtain this necessary capital when needed on acceptable terms, or at all, could force us to delay, limit, reduce or terminate our product manufacturing and development and other operations;
- If we are unable to maintain adequate revenue growth or do not successfully manage such growth, our business and growth prospects will be harmed;

- Rapidly changing technology and extensive competition in synthetic biology could make the products we are developing and producing obsolete or non-competitive unless we continue to develop and manufacture new and improved products and pursue new market opportunities;
- The continued success of our business relies heavily on our disruptive technologies and products and our position in the market as a leading provider of synthetic DNA using a silicon chip;
- If we are unable to expand our DNA synthesis manufacturing capacity, we could lose revenue and our business could be harmed.
- We depend on one single-source supplier for a critical component for our DNA synthesis process. Although we have a reserve of supplies and alternative suppliers exist, the loss of this supplier or its failure to supply us with the necessary component on a timely basis could cause delays in the future capacity of our DNA synthesis process and adversely affect our business;
- We depend on the continuing efforts of our senior management team and other key personnel. If we lose members of our senior management team or other key personnel or are unable to successfully retain, recruit and train qualified researchers, engineering and other personnel, our ability to develop our products could be harmed, and we may be unable to achieve our goals;
- We may engage in strategic transactions, including acquisitions and divestitures that could disrupt our business, cause dilution to our stockholders, reduce our financial resources, or prove not to be successful;
- Our products could in the future be subject to additional regulation by the U.S. Food and Drug Administration or other domestic and international regulatory agencies, which could increase our costs and delay our commercialization efforts, thereby materially and adversely affecting our business and results of operations;
- If we fail to maintain proper and effective internal controls, our ability to produce accurate financial statements on a timely basis could be impaired, which would adversely affect our business;
- Our ability to protect our intellectual property and proprietary technology through patents and other means is uncertain; and
- If we are unable to obtain, maintain and enforce intellectual property protection, others may be able to make, use, or sell products and technologies substantially the same as ours, which could adversely affect our ability to compete in the market.

Risk factors

The following discussion of risk factors contains forward-looking statements. These risk factors may be important to understanding other statements in this Annual Report on Form 10-K. The following information should be read in conjunction with Part II, Item 7, “Management’s discussion and analysis of financial condition and results of operations” and the consolidated financial statements and related notes in Part II, Item 8, “Consolidated financial statements and supplementary data” of this Form 10-K. The risks and uncertainties described below are not the only ones we face. Additional risk and uncertainties not presently known to us or that we presently deem less significant may also impair our business operations. If any of the events or circumstances described in the following risk factors actually occur, our business, operating results, financial condition, cash flows, and prospects could be materially and adversely affected. In that event, the market price of our common stock could decline, and you could lose part or all of your investment.

Our business, financial condition and operating results can be affected by a number of factors, whether currently known or unknown, including but not limited to those described below, any one or more of which could, directly or indirectly, cause our actual financial condition and operating results to vary materially from past, or from anticipated future, financial condition and operating results. Any of these factors, in whole or in part, could materially and adversely affect our business, financial condition, operating results and stock price.

Because of the following factors, as well as other factors affecting our financial condition and operating results, past financial performance should not be considered to be a reliable indicator of future performance, and investors should not use historical trends to anticipate results or trends in future periods.

Risks related to our business

We have incurred net losses in every period to date, and we expect to continue to incur significant losses as we develop our business and may never achieve profitability.

We have incurred net losses each year since inception and have generated limited revenue from product sales to date. We expect to incur increasing costs as we grow our business. We cannot be certain if or when we will produce sufficient revenue from our operations to support our costs. Our ability to generate product revenue sufficient to achieve profitability will depend heavily on the success of our existing products and the development and commercialization of additional products in the synthetic biology, biologic drug and data storage industries as well as leveraging our investment in our manufacturing facility in Wilsonville, Oregon. Even if profitability is achieved, we may not be able to sustain profitability. We incurred net losses of $208.7 million, $204.6 million and $217.9 million for the years ended September 30, 2024, 2023 and 2022, respectively. As of September 30, 2024, we had an accumulated deficit of $1,241.9 million. We expect to incur substantial losses and negative cash flow for the foreseeable future. We may incur significant losses in the future for a number of reasons, many of which are beyond our control, including the other risks described in this Form 10-K, market acceptance of our products, future product development, and our market penetration and margins. In addition, inflationary pressure could adversely impact our financial results by increasing operating costs. We may not fully offset these cost increases by raising prices for our products and services, which could result in downward pressure on our margins. Further, our clients may choose to reduce their business with us if we increase our pricing.

We may require additional financing to achieve our goals, and a failure to obtain this necessary capital when needed on acceptable terms, or at all, could force us to delay, limit, reduce or terminate our product manufacturing and development and other operations.

Since our inception, substantially all of our resources have been dedicated to the development of our DNA synthesis platform and our sample preparation kit for NGS. We believe that we will continue to expend substantial resources for the foreseeable future as we continue to expand our production capabilities and enter additional markets we may choose to pursue, including new COVID-19 testing products, pharmaceutical biologics drug discovery and digital data storage in DNA. These expenditures are expected to include costs associated with research and development, increasing manufacturing capabilities, including operating costs of our new Wilsonville, Oregon facility, and increasing supply capabilities as well as marketing and sales capabilities of existing and new products. In addition, other unanticipated costs may arise.

We expect that our existing cash and cash equivalents will be sufficient to fund our planned operating expenses, capital expenditure requirements and debt service payments through at least the next 12 months. However, our operating plan may change as a result of factors currently unknown to us, and as a result, we have sought and may in the future need to seek additional funds sooner than planned, through public or private equity or debt financings or other sources, such as strategic collaborations. In addition, we may seek additional capital due to favorable market conditions or strategic considerations even if we believe we have sufficient funds for our current or future operating plans. Such financing may result in dilution to stockholders, imposition of debt covenants and repayment obligations, or other restrictions that may adversely affect our business.

Our future capital requirements depend on many factors, including:

- the number and characteristics of any additional products or manufacturing processes we develop or acquire to serve new or existing markets;
- the scope, progress, results and costs of researching and developing future products or improvements to existing products or manufacturing processes, including increasing our manufacturing capabilities;
- the cost of manufacturing our DNA synthesis equipment and tools, our NGS sample preparation kits, and any future products we successfully commercialize;
- our ability to establish and maintain strategic collaborations, licensing or other arrangements and the financial terms of such agreements;
- the costs of expanding our sales and marketing capabilities in the United States and in other geographies;
- any lawsuits related to our products or commenced against us or any regulatory actions or proceedings commenced;
- the expenses needed to attract and retain skilled personnel;
- the costs associated with being a public company;

- the costs involved in preparing, filing, prosecuting, maintaining, defending and enforcing patent claims, including litigation costs and the outcome of such litigation; and
- the timing, receipt and amount of sales of, or royalties on, any future approved products, if any.

Additional funds may not be available when we need them, on terms that are acceptable to us, or at all. If adequate funds are not available to us on a timely basis, we may be required to:

- delay, limit, reduce or terminate our manufacturing, research and development activities; or
- delay, limit, reduce or terminate our establishment of marketing and sales capabilities or other activities that may be necessary to generate revenue and achieve profitability.

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

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

Our continued growth could require significant capital expenditures and might divert financial resources from other projects such as the development of new products and services, including the development and commercialization of additional products in the synthetic biology, biologic drug and data storage industries. As additional products are developed and commercialized, we may need to incorporate new equipment, implement new technology systems, or hire new personnel with different qualifications. Failure to manage this growth or transition could result in delays in launching new products, turnaround time delays, higher manufacturing costs, declining product quality, deteriorating customer service, and slower responses to competitive challenges. A failure in any one of these areas could make it difficult for us to meet market expectations for our products, and could damage our reputation and the prospects for our business.
If our management is unable to effectively manage our anticipated growth, our expenses may increase more than expected, our revenue could decline or grow more slowly than expected and we may be unable to implement our business strategy. In addition, the quality of our products may suffer, which could negatively affect our reputation and harm our ability to retain and attract customers.

If we are unable to attract new customers and retain and grow sales from our existing customers, our business will be materially and adversely affected.

In order to grow our business, we must continue to attract new customers and retain and grow sales from our existing customers on a cost-effective basis. To do this, we aim to attract new and existing buyers of synthetic DNA and NGS tool kits, convert makers of synthetic DNA into buyers of synthetic DNA, monetize our antibody discovery platform by entering into partnerships and achieve widespread market acceptance by delivering both our current product offerings and new products and technologies at low cost, with high-quality, reliable turnaround times and throughput, superior e-commerce services and effective technical support. We cannot guarantee that our efforts to provide these key requirements will be consistently acceptable to, and meet the performance expectations of, our customers and potential customers. Furthermore, the commercialization of certain of the applications for which our customers use our products may be subject to clinical studies and/or coverage and reimbursement determinations by government and private payors, and if they are proven to have less clinical value than anticipated and/or fail to receive adequate coverage and reimbursement determinations it could have a negative impact on our sales and revenues. For example, we currently generate a significant amount of our NGS tool revenues from sales related to liquid biopsy applications that are undergoing clinical studies and/or subject to coverage and reimbursement determinations by government and private payors. If these liquid biopsy applications are proven to have less clinical value than anticipated and/or fail to receive adequate coverage and reimbursement determinations, it could have a material negative impact on our sales and revenues. If we are unable to successfully attract new customers and retain and grow sales from our existing customers, our business, financial position and results of operations would be negatively impacted.

If we, or our partners or suppliers, experience a significant disruption in, or breach in security of, information technology systems, or fail to implement new systems and software successfully, our business could be adversely

affected. Cyberattacks and security vulnerabilities could lead to reduced revenue, increased costs, liability claims, or harm to our reputation or competitive position.

We rely on several centralized information technology systems throughout our Company to provide products, keep financial records, process orders, manage inventory, process shipments to customers and operate other critical functions. In addition, we currently generate a growing portion of our revenue through sales on our e-commerce platform. We manage our website and e-commerce platform internally and as a result any compromise of our security or misappropriation of proprietary information could have a material adverse effect on our business, financial condition and results of operations. We rely on encryption and authentication technology licensed from third parties to provide the security and authentication necessary to effect secure Internet transmission of confidential information, such as credit and other proprietary information. In 2024, we received ISO 27001:2022 certification, the most advanced information security standard published by the International Organization for Standardization (ISO), the world's largest developer of voluntary international standards, and the International Electrotechnical Commission. Even though our information security management system received ISO 27001:2022 certification, our, and our partners' or suppliers', information technology systems have been and may still be susceptible to damage, disruptions or shutdowns due to power outages, hardware failures, computer viruses, cyberattacks such as phishing, social engineering, ransomware, denial-of-service and other malware attacks, telecommunication failures, user errors, catastrophes or other unforeseen events. Additionally, some actors are using artificial intelligence ("AI") technology to launch more automated, targeted and coordinated attacks. Our, or our partners' or suppliers' information technology systems also may experience interruptions, delays or cessations of service or produce errors in connection with system integration, software upgrades or system migration work that takes place from time to time. If we were to experience a prolonged system disruption in the information technology systems that involve our interactions with customers or suppliers, including negatively impacting our order fulfillment and order entry on our e-commerce platform, it could result in the loss of sales and customers and significant incremental costs, which could adversely affect our business.

In addition, security breaches of our, or our partners' or suppliers', information technology systems could result in the misappropriation or unauthorized disclosure of confidential information belonging to us or to our employees, partners, customers or suppliers, including trade secrets or other intellectual property, proprietary business information, and personal information. Cybersecurity incidents, including phishing attacks and attempts to misappropriate or compromise confidential or proprietary information or sabotage enterprise IT systems are becoming increasingly frequent. While we have not, to our knowledge, experienced any material system failure, accident, or security breach to date, because techniques used to obtain unauthorized access to or to sabotage systems are constantly evolving and generally are not recognized until they are launched against a target, we cannot be sure that our continued data protection efforts and investment in information technology will prevent significant breakdowns, data leakages, breaches in our systems or the systems of our third party contractors and collaborators, or other cyber incidents in the future that could have a material adverse effect upon our reputation, business, operations, or financial condition. If such an event were to occur, it could materially disrupt our operations and programs, the development of our product candidates and production and shipment of our products. Any event that leads to unauthorized access, use, or disclosure of personal information, including personal information regarding our partners, suppliers or employees, could require us to comply with federal or state breach notification laws and foreign law equivalents, subject us to mandatory corrective action, and otherwise subject us to liability under laws and regulations that protect the privacy and security of personal information and harm our reputation. We would also be exposed to a risk of litigation and potential liability, which could materially adversely affect our business, results of operations and financial condition. In addition, the costs related to significant security breaches or disruptions could be material and exceed the limits of the cybersecurity insurance we maintain against such risks. As a result of any cyber incident, we could incur significant legal and financial exposure and reputational damages that could have a material adverse effect on our business.

Threats involving the misuse of access to our network, systems, and information by our current or former employees, contractors, vendors, or partners, whether intentional or unintentional, also pose a risk to the security of our network, systems, and information and data. For example, we are subject to the risk that employees may inadvertently share confidential information with unintended third parties, or that departing employees may take, or create their own information based on, our confidential information upon leaving the Company. In addition, any such insiders may be the victims of social engineering attacks that enable third parties to access our network, systems, and information using an authorized person's credentials. We and our network, systems, and information are also vulnerable to malicious acts by insiders, including leaking, modifying, or deleting confidential information, or performing other acts that could materially interfere with our operations and business. While we provide regular training to our employees regarding cybersecurity threats and best practices, we cannot ensure that such training or other efforts will prevent unauthorized access to or sabotage of our network, systems, and information.

In addition, we and our third-party providers are at heightened risk of theft or cyber attack of technology, data, and intellectual property through direct intrusion by private parties or foreign actors, including those affiliated with or controlled by nation-state actors. This includes attacks which could materially disrupt our systems and operations, supply

chain, and ability to produce, sell and distribute our products and services. If any theft affects or attack our technology, data, or intellectual property, our efforts to protect and enforce our intellectual property rights around the world may be inadequate to obtain a significant commercial advantage from our intellectual property, and we may be at heightened risk of losing our proprietary intellectual property rights around the world, including outside of such countries, to the extent such theft, attack or intrusion destroys the proprietary nature of our intellectual property. While we implement security measures designed to reduce these risks, there is no guarantee these measures will be adequate to safeguard all systems and networks. Any failure to maintain performance, reliability, security and availability of our systems and networks may result in accidental or unlawful destruction, damage, loss, unavailability, alteration, impairment, misuse, unauthorized disclosure of, or unauthorized access to our data, including personal or proprietary information.

Rapidly changing technology and extensive competition in synthetic biology could make the products we are developing and producing obsolete or non-competitive unless we continue to develop and manufacture new and improved products and pursue new market opportunities.

The synthetic biology industry is characterized by rapid and significant technological changes, frequent new product introductions and enhancements and evolving industry demands and standards. Our future success will depend on our ability to continually improve the products we are developing and producing, to develop and introduce new products that address the evolving needs of our customers on a timely and cost-effective basis and to pursue new market opportunities that develop as a result of technological and scientific advances. These new market opportunities may be outside the scope of our proven expertise or in areas which have unproven market demand, and the utility and value of new products and services developed by us may not be accepted in the markets served by the new products. Our inability to gain market acceptance of existing products in new markets or market acceptance of new products could harm our future operating results. Our future success also depends on our ability to manufacture these new and improved products to meet customer demand in a timely and cost-effective manner, including our ability to resolve manufacturing issues that may arise as we commence production of any new products we develop. Unanticipated difficulties or delays in replacing existing products with new products we introduce or in manufacturing improved or new products in sufficient quantities to meet customer demand could diminish future demand for our products and harm our future operating results. Further, while the impact that AI may have on the synthetic biology industry is still uncertain, recent advances in AI capabilities may indicate that it could be a significant disruptor in the synthetic biology industry. For example, AI may reduce customer demand for certain types of gene synthesis.

In addition, there is extensive competition in the synthetic biology industry, and our future success will depend on our ability to maintain a competitive position with respect to technological advances. Technological development by others may result in our technologies, as well as products developed using our technologies, becoming obsolete. Our ability to compete successfully will depend on our ability to develop proprietary technologies and products that are technologically superior to and/or are less expensive than our competitors' technologies and products. 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.

The continued success of our business relies heavily on our disruptive technologies and products and our position in the market as a leading provider or synthetic DNA using a silicon chip.

Our future profitability will depend on our ability to successfully execute and maintain a sustainable business model and generate continuous streams of revenue. Our business model is premised on the fact that we are the only DNA synthesis provider to synthesize DNA on a silicon chip on a large commercial level and the competitive advantages this creates. Our DNA synthesis methods, among other things, reduce the amount of raw materials required, speed up the synthesis process and deliver large volumes of high-quality synthetic DNA at low unit cost. However, if other competitors develop and commercialize a manufacturing process using a silicon chip or other similar technologies providing for the development of competitive synthetic DNA products at scale, this could be disruptive to our business model and could adversely affect our business prospects, financial condition and results of operations. If we are unable to convert sufficient number of current manufacturers of synthetic DNA to buyers of our synthetic DNA, surpass our competitors regarding certain industry-related data points, and effectively implement our e-commerce platform which facilitates efficient order entry and fulfillment for our customers, our business, prospects, financial condition and results of operation will be adversely affected.

Issues relating to the use of artificial intelligence and machine learning could adversely affect our business and operating results.

In our ongoing efforts to innovate and optimize operational efficiency, we have integrated AI and machine learning into various aspects of our workplace. While AI and machine learning presents opportunities for enhanced productivity and innovation, it also introduces inherent risks, including legal and regulatory, that could adversely impact our business and reputation. Proper use of AI and machine learning can lead to improved decision-making, cost reduction, and competitive

advantage. However, improper use, including algorithmic biases, ethical considerations, data privacy issues, and potential regulatory non-compliance, could result in reputational damage, legal liabilities, and financial losses. The rapidly evolving regulatory landscape surrounding AI also poses a risk, as new laws and regulations could impose additional compliance burdens, resulting in increased operational costs. We are committed to implementing robust governance and control mechanisms to mitigate these risks, but there can be no assurance that such measures will adequately prevent or mitigate the adverse effects that the integration and use of AI may have on our business, financial condition, and results of operations.

If we are unable to expand into adjacent addressable markets, our business may be materially and adversely affected.

Our future revenue growth and market potential may depend on our ability to leverage our DNA synthesis platform together with our custom libraries and other proprietary tools, such as our antibody discovery and optimization platform, in adjacent businesses such as pharmaceutical biologics drug discovery and digital data storage in DNA. There can be no assurance that we can continue to utilize our biopharma services offerings to accelerate the lead identification and lead optimization steps of antibody discovery or to discover more effective antibody drugs. In addition, our technology may not develop in a way that allows data storage in DNA to become cost competitive with traditional data storage media or in a way that otherwise enables us to address the markets opportunities that we believe exist. If we are unable to expand into adjacent addressable markets, our business, financial position and results of operations could be negatively impacted.

A significant portion of our sales depends on customers' budgets that may be subject to significant and unexpected variation, including seasonality.

Our customers' spending on research and development impacts our sales and profitability. Our customers and potential customers include chemicals/materials, diagnostics, therapeutics, food/agriculture, and their budgets can have a significant effect on the demand for our products. Their research and development budgets are based on a wide variety of factors, including factors beyond our control, such as:

- the allocation of available resources to make purchases;
- funding from government sources;
- funding from research grants;
- changes in government programs that provide funding to research institutions and companies;
- the spending priorities among various types of research equipment;
- policies regarding capital expenditures during recessionary periods;
- political climate or macroeconomic conditions, including economic downturns or market uncertainty or reduced spending in response to emergency public health situations;
- inability to raise sufficient funds in the capital markets;
- changes in the regulatory environment;
- healthcare legislative reform measures,
- differences in budgetary cycles;
- inflationary pressures; and
- market acceptance of relatively new technologies, such as ours.

Any decrease in spending or change in spending priorities of our customers and potential customers could significantly reduce the demand for our products. As we expand into new geographic markets, our revenue may be impacted by seasonal trends in the different regions, the seasonality of customer budgets in those regions and the mix of domestic versus international sales. In addition, access to capital markets is critical to many of our customers' ability to fund their operations, including purchasing our products and services. Traditionally, biotechnology and life sciences companies have funded their research and development expenditures by raising capital in the equity markets. Declines and uncertainties in these markets have severely restricted raising new capital and have affected companies' ability to fund existing research and development efforts which may lead them to delay project starts, reduce or cancel orders and or cancel projects. In the past, we experienced some cancellations of customer orders that we believe were due to customers' funding concerns. Moreover, we have no control over the timing and volume of purchases by these customers and potential customers, and as

a result, revenue from these sources may vary significantly due to factors that can be difficult to forecast. Any delay or reduction in purchases by customers and potential customers or our inability to forecast fluctuations in demand could harm our future operating results.

We generally do not have long-term contracts with our customers requiring them to purchase any specified quantities from us.

We generally do not have long-term contracts with our customers requiring them to purchase any specified quantities from us and without such contracts our customers are not obligated to order or reorder our products. As a result, we cannot accurately predict our customers' decisions to reduce or cease purchasing our products. Additionally, even where we enter into contracts with our customers, there is no guarantee that such agreements will be negotiated on terms that are commercially favorable to us in the long-term. Therefore, if many of our customers were to substantially reduce their transaction volume or cease ordering products from us, this could materially and adversely affect our financial performance.

We may be unable to successfully recruit and maintain adequate sales, marketing and other support personnel in order to increase our market share and expand our customer base.

Our ability to achieve profitability depends on our being able to increase our market share and expand our customer base. Although members of our sales and marketing teams have considerable industry experience and have engaged in marketing activities for our products, in the future we must expand our sales, marketing, distribution and customer support capabilities with the appropriate technical expertise to effectively market our products. Furthermore, it takes six to nine months to recruit, onboard and ramp sales personnel to full capability. To perform sales, marketing, distribution and customer support successfully, we will face a number of risks, including that:

- we may not be able to attract, retain and manage the sales, marketing and service workforce necessary to publicize and gain broader market acceptance of our technology;
- the time and cost of establishing a specialized sales, marketing and service force for a particular product or service, which may be difficult to justify in light of the revenue generated;
- our field sales personnel may not be able to access our customers' premises which could delay the adoption and ordering of our products; and
- our sales, marketing and service force may be unable to initiate and execute successful commercialization activities with respect to new products or markets we may seek to enter.

If our sales and marketing efforts, or those of any third-party sales and distribution partners, are not successful, our new technologies and products may not gain market acceptance, which could materially impact our business operations.

If we are unable to expand our DNA synthesis manufacturing capacity, we could lose revenue and our business could be harmed.

In order to expand our manufacturing capacity of new and existing products, we may need to either build additional internal manufacturing capacity, contract with one or more partners, or both. Our production facility in Wilsonville, Oregon has increased our manufacturing capacity, but if customer demand increases, we may need to expand manufacturing capacity further, which could impact our revenue growth. Our technology and the production process for our DNA synthesis equipment and tools are complex, involving specialized parts, and we may encounter unexpected difficulties in the manufacture, improvement or increasing the capacity of our DNA synthesis equipment and tools, and addressing these difficulties may cause us to divert our time and resources from our other product offerings. There is no assurance that we will be able to continue to increase manufacturing capacity internally or that we will find one or more suitable partners to help us towards this objective, in order to meet the volume and quality requirements necessary for success in our existing and potential markets. Manufacturing and product quality issues may arise as we continue to increase the scale of our production. If our DNA synthesis equipment and tools do not consistently produce DNA products that meet our customers' performance expectations, our reputation may be harmed, and we may be unable to generate sufficient revenue to become profitable. Any delay or inability in expanding our manufacturing capacity could diminish our ability to develop or sell our products, which could result in lost revenue and materially harm our business, financial condition and results of operations.

We are substantially dependent on the success of our synthetic DNA products.

To date, we have invested a substantial portion of our efforts and financial resources towards the research and development and commercialization of our synthetic DNA products. The DNA synthesis business is very capital intensive, particularly

for early-stage companies that do not have significant off-setting revenues and which are making significant investments in the commercialization and marketing of their products.

Substantially all of our revenue generated to date is from our synthetic DNA products. Our financial results are dependent on strengthening our synthetic biology and NGS product groups while diversifying into other developing sectors such as pharmaceutical biologics drug discovery, creating useful DNA libraries and data storage.

Our near-term prospects, including our ability to finance our research and development activities and initiatives and enter into strategic collaborations, will depend heavily on the successful development and commercialization of our synthetic DNA products. These initiatives will be substantially dependent on our ability to generate revenue from our synthetic DNA products and obtain other funding necessary to support these initiatives. Our inability to continue these initiatives and initiate new research and development efforts could result in a failure to develop or delay in developing new products, improve upon existing products such that sectors such as pharmaceutical biologics drug discovery, DNA library creation and data storage may never be fully developed, and expand our addressable market, which could have a material and adverse impact on our sales, business, financial position and results of operations.

We depend on one single-source supplier for a critical component for our DNA synthesis process. Although we have a reserve of supplies and alternative suppliers exist, the loss of this supplier or its failure to supply us with the necessary component on a timely basis could cause delays in the future capacity of our DNA synthesis process and adversely affect our business.

We depend on one single-source supplier for a critical component for our DNA synthesis process. We do not currently have the infrastructure or capability internally to manufacture this component. Although we have a reserve of supplies and although alternative suppliers exist for this critical component of our synthesis process, our existing DNA synthesis manufacturing process has been designed based on the functions, limitations, features and specifications of the components that we currently utilize. We have a supply agreement in place with this component supplier. However, there can be no assurance that our supply of this component will not be limited, interrupted, or of satisfactory quality or continue to be available at acceptable prices. Additionally, we do not have any control over the process or timing of the acquisition or manufacture of materials by our supplier and cannot ensure that it will deliver to us the component we order on time, or at all.

The loss of this component provided by this supplier could require us to change the design of our manufacturing process based on the functions, limitations, features and specifications of the replacement components.

In addition, the lead time needed to establish a relationship with a new supplier can be lengthy, and we may experience delays in meeting demand in the event we must switch to a new supplier. The time and effort to qualify a new supplier could result in additional costs, diversion of resources or reduced manufacturing yields, any of which would negatively impact our operating results. Further, we may be unable to enter into agreements with a new supplier on commercially reasonable terms, which could have a material adverse impact on our business. Our dependence on this single-source supplier exposes us to certain risks, including the following:

- our supplier may cease or reduce production or deliveries, raise prices or renegotiate terms;
- we may be unable to locate a suitable replacement on acceptable terms or on a timely basis, if at all;
- if there is a disruption to our single-source supplier's operations, and if we are unable to enter into arrangements with alternative suppliers, we will have no other means of completing our synthesis process until they restore the affected facilities or we or they procure alternative manufacturing facilities or sources of supply;
- delays caused by supply issues may harm our reputation, frustrate our customers and cause them to turn to our competitors for future projects; and
- our ability to progress our DNA synthesis products could be materially and adversely impacted if the single-source supplier upon which we rely were to experience a significant business challenge, disruption or failure due to issues such as financial difficulties or bankruptcy, issues relating to other customers such as regulatory or quality compliance issues, or other financial, legal, regulatory, operational or reputational issues.

Moreover, to meet anticipated market demand, our single-source supplier may need to increase manufacturing capacity, which could involve significant challenges. This may require us and our supplier to invest substantial additional funds and hire and retain the technical personnel who have the necessary experience. Neither we nor our supplier may successfully complete any required increase to existing manufacturing capacity in a timely manner, or at all.

We must continue to secure and maintain sufficient and stable supplies of raw materials. Any shortage of raw materials or materials necessary for our production capabilities may adversely affect our business.

Although historically we have not experienced price increases due to unexpected shortages in raw materials or other materials and other unanticipated events, there is no assurance that our supply of raw materials or other materials will not be significantly adversely affected in the future, which may in turn adversely affect our business, prospects, financial condition and results of operation.

In addition, as we grow, our existing suppliers may not be able to meet our increasing demand, and we may need to find additional suppliers. There is no assurance that we will always be able to secure suppliers who provide raw materials at the specification, quantity and quality levels that we demand (or at all) or be able to negotiate acceptable fees and terms of services with any such suppliers. Identifying a suitable supplier is an involved process that requires us to become satisfied with their quality control, responsiveness and service, financial stability and labor and other ethical practices. Even if we are able to expand existing sources, we may encounter delays in production and added costs as a result of the time it takes to train suppliers in our methods, products and quality control standards.

We typically do not enter into agreements with our suppliers but secure our raw materials and component parts we use in our equipment on a purchase order basis. Our suppliers may reduce or cease their supply of raw materials, component parts and outsourced services and products to us at any time in the future. If the supply of raw materials, component parts and the outsourced services and products is interrupted due to shortages or other reasons, our production processes may be delayed. If any such event occurs, our operation and financial position may be adversely affected.

A deterioration of our relationship with any of our suppliers, or problems experienced by these suppliers, could lead to shortages in our production capacity for some or all of our products. In such case, we may not be able to fulfill the demand of existing customers or supply new customers. In addition, shortages of raw materials or component parts or an increase in the cost of the raw materials or component parts we use could result in decreased revenue or could impair our ability to maintain or expand our business.

While we have experienced increased operating costs in recent periods, which we believe were due in part to a rise in inflation, we do not believe that inflation has had a material effect on our business, financial condition or results of operations. In the event of significant price increases for raw materials, we may have to pass the increased raw materials costs to our customers. However, we cannot assure you that we will be able to raise the prices of our products sufficiently to cover increased costs resulting from increases in the cost of our raw materials or overcome the interruption of a sufficient supply of qualified raw materials for our products. As a result, a price increase for our raw materials may negatively impact our business, financial position and results of operations.

We may encounter difficulties in managing our growth, and these difficulties could impair our profitability.

Currently, we are working simultaneously on multiple projects, expanding our capacity as well as targeting several market sectors, including activities in the chemicals/materials, diagnostics, therapeutics, food and data storage sectors. In addition, we work to renew our ISO certifications from time to time. These diversified operations and activities place significant demands on our limited resources and require us to substantially expand the capabilities of our technical, administrative and operational resources.

If we are unable to manage this growth and the periodic ISO recertification of our manufacturing facilities effectively, our shipments to our customers could be impacted, our time and resources could be diverted from other products and offerings and our business and operating results could suffer. In addition, if we fail to timely deliver products or meet quantity requirements under our contracts with customers, we may offer discounts to them, and customers' minimum purchase requirements, if applicable, may be reduced. Our ability to manage our operations and costs, including research and development, costs of components, manufacturing, sales and marketing, requires us to continue to enhance our operational, financial and management controls, reporting systems and procedures and to attract and retain sufficient numbers of talented employees. Failure to attract and retain sufficient numbers of talented employees will further strain our human resources and could impede our growth.

Our revenue, results of operations, cash flows and reputation in the marketplace may suffer upon the loss of a limited number of large customers.

We have derived, and believe we may continue to derive, a significant portion of our revenues from a limited number of large customers. Our customers may buy less of our products depending on their own technological developments, the clinical efficacy and commercial success of the applications for which they use our products, end-user demand for our products and internal budget cycles. In addition, existing customers may choose to produce some or all of their synthetic DNA requirements internally by using or developing manufacturing capabilities organically or by using capabilities from acquisitions of assets or entities from third parties with such capabilities. The loss of any significant customer or a significant reduction in the amount of product ordered by any significant customer would adversely affect our revenue, results of operations, cash flows and reputation in the marketplace.

We depend on the continuing efforts of our senior management team and other key personnel. If we lose members of our senior management team or other key personnel or are unable to successfully retain, recruit and train qualified researchers, engineering and other personnel, our ability to develop our products could be harmed, and we may be unable to achieve our goals.

Our future success depends upon the continuing services of members of our senior management team and scientific and engineering personnel. We are highly dependent on Dr. Emily Leproust, our Chief Executive Officer, who is employed "at will," meaning we or she may terminate the employment relationship at any time. In particular, our researchers and engineers are critical to our future technological and product innovations, and we will need to hire additional qualified personnel. We may not be able to attract and retain qualified personnel on acceptable terms, or at all. In addition, to the extent we hire personnel from competitors, we may be subject to allegations that they have been improperly solicited or that they have divulged proprietary or other confidential information, or that their former employers own their research output. Our industry, particularly in the San Francisco Bay Area, is characterized by high demand and intense competition for talent, and the turnover rate can be high. We compete for qualified management and scientific personnel with other life science companies, academic institutions and research institutions, particularly those focusing on genomics.

Many of these employees could leave our Company with little or no prior notice and would be free to work for a competitor. If one or more of our senior executives or other key personnel were unable or unwilling to continue in their present positions, we might not be able to replace them easily or at all, and other senior management may be required to divert attention from other aspects of the business. In addition, we do not have "key person" life insurance policies covering members of our management team or other key personnel except Dr. Leproust. While we conduct succession planning to identify the person(s) for key positions who possess the skills and capabilities to take on the responsibilities filled by our leaders, we cannot assure you that these strategies will successfully mitigate the loss of any key personnel. The loss of any of these individuals or our inability to attract or retain qualified personnel, including researchers, engineers and others, could prevent us from pursuing collaborations and adversely affect our product development and introductions, business growth prospects, results of operations and financial condition.

We may engage in strategic transactions, including acquisitions, collaborations, or investments in other companies or technologies, that could disrupt our business, cause dilution to our stockholders, reduce our financial resources, or prove not to be successful.

We may enter into transactions to acquire other businesses, products or technologies and our ability to do so successfully cannot be ensured. While historically we have not completed many acquisitions, we closed a business acquisition in the first quarter of 2022 and we are continuing to pursue opportunities in the life sciences industry that complement and expand our synthetic DNA product offering and our other products in both local and international markets. If we identify suitable opportunities, we may not be able to make such acquisitions on favorable terms or at all. Any acquisitions we make may not strengthen our competitive position, and these transactions may be viewed negatively by customers or investors. We may decide to incur debt in connection with an acquisition or issue our common stock or other equity securities to the stockholders of the acquired company, as we did for the business acquisitions, which would reduce the percentage ownership of our existing stockholders. We could incur losses resulting from undiscovered liabilities of the acquired business that are not covered by any indemnification we may obtain from the seller. In addition, we may not be able to successfully integrate the acquired personnel, technologies and operations into our existing business in an effective, timely and non-disruptive manner. Acquisitions may also divert management attention from day-to-day responsibilities, increase our expenses and reduce our cash available for operations and other uses. In addition, we cannot guarantee that we will be able to fully recover the costs of such acquisitions or that we will be successful in leveraging any such strategic transactions into increased business, revenue or profitability. We also cannot predict the number, timing or size of any future acquisitions or the effect that any such transactions might have on our operating results.

From time to time, we may consider other strategic transactions, including collaborations or investments in other companies. The competition for collaborators is intense, and the negotiation process is time-consuming and complex. Any new collaboration may be on terms that are not optimal for us, and we may not be able to maintain any new collaboration. Any such collaboration may require us to incur non-recurring or other charges, increase our near- and long-term expenditures and pose significant integration or implementation challenges or disrupt our management or business. These transactions would entail numerous operational and financial risks, including exposure to unknown liabilities, disruption of our business and diversion of our management's time and attention to manage a collaboration, incurrence of substantial debt or dilutive issuances of equity securities to pay transaction consideration or costs, higher than expected collaboration, acquisition or integration costs, write-downs of assets or goodwill or impairment charges, increased amortization expenses, difficulty and cost in facilitating the collaboration or combining the operations and personnel of any acquired business, impairment of relationships with key suppliers, manufacturers or customers of any acquired business due to changes in management and ownership and the inability to retain key employees of any acquired business. Antitrust or other competition laws may also limit our ability to acquire or work collaboratively with certain businesses or to fully realize the benefits of strategic transactions to acquire or collaborate with other businesses. Accordingly, although there can be no

assurance that we will undertake or successfully complete any collaborations, any transactions that we do complete may be subject to the foregoing or other risks and have a material and adverse effect on our business, financial condition, results of operations and prospects. Conversely, any failure to enter into any collaboration or other strategic transaction that would be beneficial to us could delay the development and potential commercialization of our products and technologies.

As we expand our development and commercialization activities outside of the United States, we will be subject to an increased risk of inadvertently conducting activities in a manner that violates the U.S. Foreign Corrupt Practices Act and similar laws. If that occurs, we may be subject to civil or criminal penalties which could have a material adverse effect on our business, financial condition, results of operations and growth prospects.

We are subject to the U.S. Foreign Corrupt Practices Act, or the FCPA, which prohibits corporations and individuals from paying, offering to pay, or authorizing the payment of anything of value to any foreign government official, government staff member, political party, or political candidate in an attempt to obtain or retain business or to otherwise influence a person working in an official capacity. We are also subject to the UK Anti-Bribery Act, which prohibits both domestic and international bribery, as well as bribery across both public and private sectors. We require that our employees review our Code of Business Conduct and Ethics, our Anti-Money Laundering Policy and our Anti-Corruption Policy on an annual basis.

In the course of establishing and expanding our commercial operations and complying with non-U.S. regulatory requirements, we will need to establish and expand business relationships with various third parties and we will interact more frequently with foreign officials, including regulatory authorities. Expanded programs to maintain compliance with such laws will be costly and may not be effective. Any interactions with any such parties or individuals where compensation is provided that are found to be in violation of such laws could result in substantial fines and penalties and could materially harm our business. Furthermore, any finding of a violation under one country's laws may increase the likelihood that we will be prosecuted and be found to have violated another country's laws. We require that our employees annually certify that they understand and will comply with our Code of Business Conduct and Ethics Policy, our Anti-Money Laundering Policy, our Anti-Corruption Policy as well as the UK Modern Slavery Act of 2015. Even so, if our business practices outside the United States are found to be in violation of the FCPA, UK Anti-Bribery Act, antitrust or other similar laws, we may be subject to significant civil and criminal penalties which could have a material adverse effect on our financial condition and results of operations.

We could engage in exporting or related activity that contravenes international trade restraints, or regulatory authorities could promulgate more far-reaching international trade restraints, which could give rise to one or more of substantial legal liability, impediments to our business and reputational damage.

Our international business activities must comport with U.S. export controls and other international trade restraints, including the U.S. Department of Commerce's Export Administration Regulations and economic sanctions regulations administered by the U.S. Treasury Department's Office of Foreign Assets Controls.

We have established an international trade compliance program that encompasses best practices for preventing, detecting and addressing noncompliance with international trade restraints. Furthermore, to date our exports have not been licensable under export controls; however, we could fail to observe the compliance program requirements in a manner that leaves us in noncompliance with export controls or other international trade restraints. In addition, authorities could promulgate international trade restraints that impinge on our ability to pursue our business as planned. One or more of resulting legal penalties, restraints on our business or reputational damage could have material adverse effects on our business and financial condition.

We operate in a highly competitive industry and if we are not able to compete effectively, our business and operating results will likely be harmed.

We face competition from a broad range of providers of core synthetic biology products such as GenScript Biotech Corporation, DNA Script, Inc., GENEWIZ (owned by Azenta), Integrated DNA Technologies, Inc. (owned by Danaher Corporation), DNA 2.0 Inc. d/b/a/ ATUM, GeneArt (owned by Thermo Fisher Scientific Inc.), Eurofins Genomics LLC, Promega Corporation, OriGene Technologies, Inc., Blue Heron Biotech, LLC, Elegen and others. Additionally, we compete with both large and emerging providers in the life sciences tools and diagnostics industries focused on sample preparation for NGS such as Thermo Fisher Scientific Inc., Illumina, Inc., Integrated DNA Technologies, Inc., Roche, New England Bioloabs and Agilent. In the antibody discovery market, we compete with contract research organizations including Curia, GenScript, and Genovac (formerly part of Aldevron, LLC), and antibody discovery biotechnology companies, such as Fair Journey/Iontas, Adimab, Distributed Bio (owned by Charles River), Ablexis, Specifica, OmniAb and AbCellera Biologics Inc. In the emerging field of DNA digital data storage, we compete with Biomemory, Catalog Technologies, Inc., GenScript, various academic institutions, and other emerging competitors. We may not be successful in maintaining our competitive position for a number of reasons. Some of our current competitors, as well as many of our

potential competitors, have significant name recognition, substantial intellectual property portfolios, longer operating histories, greater resources to invest in new technologies, substantial experience in new product development and manufacturing capabilities and more established distribution channels to deliver products to customers than we do. These competitors may be able to respond more quickly and effectively than we can to new or changing opportunities, technologies, standards or customer requirements. Our competitors may develop disruptive technologies or products that are comparable or superior to our technologies and products. In light of these advantages, even though we believe our technology is superior to the products offerings of our competitors, current or potential customers might accept competitive products in lieu of purchasing our products. Increased competition is likely to result in continued pricing pressures, which could harm our sales, profitability or market share. Our failure to continue competing effectively or winning additional business with our existing customers could materially and adversely affect our business, financial condition or results of operations.

We may be subject to significant pricing pressures and if we are unable to pass on any cost increase to our customers, our business, financial position and results of operations could be adversely affected.

Over time, increasing customer demand for lower prices could force us to discount our products and result in lower margins. The impact may be further exacerbated if we are unable to successfully control production costs. In addition, if due to rising market prices as a result of inflation or otherwise, our suppliers increase prices or reduce discounts on their supplies, we may be unable to pass on any cost increase to our customers, thereby resulting in reduced margins and profits. Furthermore, changes in our product mix may negatively affect our gross margins. Overall, these pricing pressures may adversely affect our business, financial position and results of operations.

Ethical, legal and social concerns surrounding the use of genetic information could reduce demand for our technology.

Our products may be used to create DNA sequences of humans, agricultural crops and other living organisms. Our products could be used in a variety of applications, which may have underlying ethical, legal and social concerns. Governmental authorities could, for safety, social or other purposes, impose limits on or implement regulation of the use of gene synthesis. Such concerns or governmental restrictions could limit the use of our DNA synthesis products, which could have a material adverse effect on our business, financial condition and results of operations. In addition, public perception about the safety and environmental hazards of, and ethical concerns over, genetically engineered products and processes could influence public acceptance of our technologies, products and processes. These concerns could result in increased expenses, regulatory scrutiny, delays or other impediments to our programs.

We use biological and hazardous materials that require considerable expertise and expense for handling, storage and disposal and may result in claims against us.

We work with materials, including chemicals, biological agents, and compounds and DNA samples that could be hazardous to human health and safety or the environment. Our operations also produce hazardous and biological waste products. Federal, state and local laws and regulations govern the use, generation, manufacture, storage, handling and disposal of these materials and wastes. Compliance with applicable environmental laws and regulations is expensive, and current or future environmental laws and regulations may restrict our operations. If we do not comply with applicable regulations, we may be subject to fines and penalties.

In addition, we cannot eliminate the risk of accidental injury or contamination from these materials or wastes, which could cause an interruption of our commercialization efforts, research and development programs and business operations, as well as environmental damage resulting in costly clean-up and liabilities under applicable laws and regulations. Furthermore, environmental laws and regulations are complex, change frequently and have tended to become more stringent. We cannot predict the impact of such changes and cannot be certain of our future compliance. While our property insurance policy provides limited coverage in the event of contamination from hazardous and biological products and the resulting cleanup costs, we do not currently have any additional insurance coverage for legal liability for claims arising from the handling, storage or disposal of hazardous materials. Accordingly, in the event of contamination or injury, we could be liable for damages or penalized with fines in an amount exceeding our resources and our operations could be suspended or otherwise adversely affected.

We could develop DNA sequences or engage in other activity that contravenes biosecurity requirements, or regulatory authorities could promulgate more far-reaching biosecurity requirements that our standard business practices cannot accommodate, which could give rise to substantial legal liability, impede our business and damage our reputation.

The Federal Select Agent Program, or the FSAP, involves rules administered by the Centers for Disease Control and Prevention and Toxins and the Animal and Plant Health Inspection Service that regulate possession, use and transfer of biological select agents and toxins that have the potential to pose a severe threat to public, animal or plant health or to animal or plant products.

We have established a comprehensive, biosecurity program under which we follow biosafety and biosecurity best practices and avoid DNA synthesis activities that implicate FSAP rules; however, we could inadvertently err in our observance of compliance program requirements in a manner that leaves us in noncompliance with FSAP or other biosecurity rules. In addition, authorities could promulgate new biosecurity requirements that restrictions our operations. One or more resulting legal penalties, restraints on our business or reputational damage could have material adverse effects on our business and financial condition.

Third parties may use our products in ways that could damage our reputation.

After our customers have received our products, we do not have any control over their use and our customers may use them in ways that are harmful to our reputation as a supplier of synthetic DNA products. In addition, while we have established a biosecurity program designed to comply with biosafety and biosecurity requirements and perform export control screening in an effort to ensure that third parties do not obtain our products for malevolent purposes, we cannot guarantee that these preventative measures will eliminate or reduce the risk of the domestic and global opportunities for the misuse of our products. Accordingly, in the event of such misuse, our reputation, future revenue and operating results may suffer.

Any damage to our reputation or brand may materially and adversely affect our business, financial condition and results of operations.

We believe that developing and maintaining our brand is important to our success and that our financial success is influenced by the perception of our brand by our customers. Furthermore, the importance of our brand recognition may become even greater to the extent that competitors offer more products similar to ours. Many factors, some of which are beyond our control, are important to maintaining our reputation and brand. These factors include our ability to comply with ethical, social, product, labor and environmental standards. Any actual or perceived failure in compliance with such standards could damage our reputation and brand.

Because we are subject to existing and potential additional governmental regulation, the markets for our products may be narrowed.

We are subject, both directly and indirectly, to the adverse impact of existing and potential future government regulation of our operations and markets. For example, the export of our products is subject to strict regulatory control in a number of jurisdictions. The failure to satisfy export control criteria or obtain necessary clearances could delay or prevent the shipment of products, which could adversely affect our revenues and profitability. Moreover, the life sciences industry, which is currently the primary market for our technology, has historically been heavily regulated. There are, for example, laws in several jurisdictions restricting research in genetic engineering, which can operate to narrow our markets. Given the evolving nature of this industry, legislative bodies or regulatory authorities may adopt additional regulation that adversely affects our market opportunities. Our business is also directly affected by a wide variety of government regulations applicable to business enterprises generally and to companies operating in the life science industry in particular. Failure to comply with these regulations or obtain or maintain necessary permits and licenses could result in a variety of fines or other censures or an interruption in our business operations which may have a negative impact on our ability to generate revenues and could increase the cost of operating our business.

Our products could in the future be subject to additional regulation by the U.S. Food and Drug Administration or other domestic and international regulatory agencies, which could increase our costs and delay our commercialization efforts, thereby materially and adversely affecting our business and results of operations.

The FDA regulates medical devices, including in vitro diagnostics, or IVDs. IVDs are a category of medical devices that include reagents, instruments, and systems intended for use in diagnosis of disease or other conditions, including a determination of the state of health, in order to cure, mitigate, treat, or prevent disease or its sequelae. IVDs are intended for use in the collection, preparation, and examination of specimens taken from the human body. An RUO IVD product is an IVD product that is in the laboratory research phase of development or is intended for use in the conduct of nonclinical laboratory research and not intended to produce results for clinical use. As such, an RUO IVD is not intended for use in clinical investigations or in clinical practice. Such RUO products do not require premarket clearance or approval from the FDA, provided that they are labeled “For Research Use Only. Not For Use In Diagnostic Procedures” pursuant to FDA regulations. Our IVD products are not intended for clinical or diagnostic use, and we market and label them as RUO. Our customers, however, may use our products in their own laboratory-developed tests, or LDTs. The FDA has historically taken the position that LDTs are considered to be IVDs, but has generally exercised enforcement discretion. On May 6, 2024, the FDA published a final rule that phases out over a period of four years the policy of enforcement discretion it has historically applied to most LDTs (the “LDT Final Rule”). While the LDT Final Rule is currently being challenged in Federal court and receiving Congressional scrutiny, if the increase of regulatory requirements under the LDT Final Rule remain in place, it may influence the sales of our products and how customers employ our products, and subject us to

additional regulatory controls including enforcement action, administrative and judicial sanctions, all of which could adversely affect our business, financial condition, or results of operations. See *"Business-Government regulation-FDA"*.

In the future, certain of our products or related applications could be subject to additional FDA regulation. Even where a product is not subject to FDA clearance or approval requirements or deemed exempt, the FDA may impose restrictions as to the types of customers to which we can market and sell our products. Such regulation and restrictions may materially and adversely affect our business, financial condition and results of operations. Other regulatory regimes that do not currently present material challenges but that could in the future present material challenges include export controls and biosecurity.

Many countries have laws and regulations that could affect our products and which could limit our ability to sell our products in those countries. The number and scope of these requirements are increasing. We may not be able to obtain regulatory approvals in such countries or may incur significant costs in obtaining or maintaining foreign regulatory approvals. For example, the European Union requires manufacturers to adhere to the In Vitro Diagnostic Device Regulation (EU) 2017/746, or IVDR, for the marketing and sale of medical devices. Complying with the requirements of the IVDR may require us to incur significant expenditures. Failure to meet these requirements could adversely impact our business in the EU and other regions that tie their product registrations or chemical regulations to the EU requirements.

Certain of our potential customers may require that we become certified under the Clinical Laboratory Improvement Amendments of 1988.

Although we are not currently subject to the Clinical Laboratory Improvement Amendment of 1988, or CLIA, we may in the future be required by certain customers to obtain a CLIA certification. CLIA, which extends federal oversight over clinical laboratories by requiring that they be certified by the federal government or by a federally approved accreditation agency, is designed to ensure the quality and reliability of clinical laboratories by mandating specific standards in the areas of personnel qualifications, administration and participation in proficiency testing, patient test management, quality control, quality assurance and inspections. If our customers require a CLIA certification, we will have to continually expend time, money and effort to ensure that we meet the applicable quality and safety requirements, which may divert the attention of management and disrupt our core business operations.

We currently manufacture all of our products and multiple sub-assemblies at our manufacturing facilities in Wilsonville, Oregon and South San Francisco, California, and if either of these facilities are destroyed or we experience at either of these facilities any manufacturing difficulties, disruptions, or delays, this could limit supply of our products or adversely affect our ability to sell products or conduct our clinical trials, and our business would be adversely impacted

We currently manufacture all of our products and multiple sub-assemblies at our manufacturing facilities in Wilsonville, Oregon and South San Francisco, California. Although a portion of our manufacturing still takes place at our South San Francisco facility, we depend primarily on our manufacturing facility in Wilsonville, Oregon. For example, we have recently consolidated all synthetic biology production in Wilsonville, and our Express Genes product is manufactured solely in Wilsonville. We still manufacture a significant portion of our NGS products at our South San Francisco facility. Any manufacturing difficulties at our two manufacturing could result in turnaround time delays. With respect to our Wilsonville facility, if regulatory, manufacturing, or other problems require us to discontinue production at the facility, we will not be able to manufacture our synthetic genes, oligo pools or selected NGS products or create our DNA libraries, which would adversely impact our business. In addition, if either of our facilities or the equipment therein is significantly damaged, destroyed, or affected by fire, flood, power loss, or similar events, or is shut down for health and safety reasons, including public health emergencies, severe weather, or other reasons, we may not be able to quickly or inexpensively replace our manufacturing capacity or replace the facility. In the event of a temporary or protracted loss of either of these facilities or the equipment therein, we might not be able to transfer manufacturing to another third party. Even if we could transfer manufacturing from one facility to another, the shift would likely be expensive and time-consuming, particularly if we were to maintain the current manufacturing standards procedures at such alternative facility.

Natural disasters, public health crises, political crises, severe weather events, and other catastrophic events or other events outside of our control may damage our facilities or the facilities of third parties on which we depend and could impact our ability to sell products.

Our headquarters in South San Francisco, California is located near known earthquake fault zones and is vulnerable to damage from earthquakes. Our primary manufacturing facility in Wilsonville, Oregon is vulnerable to extreme heat, wildfires, and severe weather events, all of which may be further exacerbated by the effects of climate change, as well as damage from earthquakes. An earthquake or other natural disaster or power shortages or outages could disrupt operations or impair critical systems at our headquarters or at any of our other facilities throughout the world. We, our suppliers, third-party service providers and customers are vulnerable to damage from natural disasters, including fire, floods or monsoons, power loss, communications failures, public health crises, such as pandemics and epidemics, political crises, such as

terrorism, war, political instability or other conflict and similar events. If any disaster were to occur, our ability to operate our business at any of our facilities could be seriously, or potentially completely, impaired. In addition, the nature of our activities could cause significant delays in our research programs and commercial activities and make it difficult for us to recover from a disaster. The insurance we maintain may not be adequate to cover our losses resulting from disasters or other business interruptions. Accordingly, an earthquake or other disaster could materially and adversely harm our ability to conduct business. Furthermore, our in vivo antibody discovery services involve mice. In the past, vivarium sites have been shut down by animal activists, and any disturbance or shut down at the site where our in vivo antibody discovery work is being conducted could disrupt our business operations or harm our reputation.

Delivery of our products could be delayed or disrupted by factors beyond our control, and we could lose customers as a result.

We rely on third-party carriers for the timely delivery of our products. As a result, we are subject to carrier disruptions and increased costs that are beyond our control, including travel restrictions, employee strikes, inclement weather, delays due to public health emergencies, and increased fuel costs. For example, in the past we have experienced shipment delays due to flight cancellations caused by inclement weather. Any failure to deliver products to our customers in a timely and accurate manner may damage our reputation and brand and could cause us to lose customers. If our relationship with any of these third-party carriers is terminated or impaired or if any of these third parties are unable to deliver our products, the delivery and acceptance of our products by our customers may be delayed which could harm our business and financial results. The failure to deliver our products in a timely manner may harm our relationship with our customers, increase our costs and otherwise disrupt our operations.

Doing business internationally creates operational and financial risks for our business.

During our fiscal years ended September 30, 2024, 2023 and 2022, 40%, 40% and 41%, respectively, of our revenue was generated from customers located outside of the United States. In connection with our growth strategy, we intend to further expand in international markets. Conducting and launching operations on an international scale requires close coordination of activities across multiple jurisdictions and time zones and consumes significant management resources. If we fail to coordinate and manage these activities effectively, our business, financial condition or results of operations could be adversely affected. International sales entail a variety of risks, including longer payment cycles and difficulties in collecting accounts receivable outside of the United States, currency exchange fluctuations, challenges in staffing and managing foreign operations, tariffs and other trade barriers (including tariffs enacted and proposed by the U.S. government on various imports from China and by the Chinese government on certain U.S. goods), unexpected changes in legislative or regulatory requirements of foreign countries into which we sell our products, difficulties in obtaining export licenses or in overcoming other trade barriers, laws and business practices favoring local companies, political instability, including conflicts and tensions involving Russia and China and the Israel-Hamas war, economic instability, difficulties protecting or procuring intellectual property rights, and restrictions resulting in delivery delays and significant taxes or other burdens of complying with a variety of foreign laws.

Changes in the value of the relevant currencies may affect the cost of certain items required in our operations. Changes in currency exchange rates may also affect the relative prices at which we are able to sell products in the same market. Our revenue from international customers may be negatively impacted as increases in the U.S. dollar relative to our international customers' local currency could make our products more expensive, impacting our ability to compete. Our costs of materials from international suppliers may increase if in order to continue doing business with us they raise their prices as the value of the U.S. dollar decreases relative to their local currency. Foreign policies and actions regarding currency valuation could result in actions by the United States and other countries to offset the effects of such fluctuations. The recent global financial downturn has led to a high level of volatility in foreign currency exchange rates and that level of volatility may continue, which could adversely affect our business, financial condition or results of operations.

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, or the Code, a corporation that undergoes an "ownership change" is subject to limitations on its ability to use its pre-change net operating loss carryforwards, or NOLs, to offset future taxable income. We have experienced at least one ownership change in the past, and we may experience ownership changes in the future. 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 use NOLs of companies that we may acquire in the future may be subject to limitations. For these reasons, we may not be able to use a material portion of the NOLs reflected on our balance sheet, even if we attain profitability.

The enactment of legislation implementing changes in taxation of international business activities, the adoption of other corporate tax reform policies, or changes in tax legislation or policies could impact our future financial position and results of operations.

Corporate tax reform, base-erosion efforts and tax transparency continue to be high priorities in many tax jurisdictions where we intend to have business operations. As a result, policies regarding corporate income and other taxes in numerous jurisdictions are under heightened scrutiny and tax reform legislation is being proposed or enacted in a number of jurisdictions. For example, the Tax Cuts and Jobs Act of 2017, or the Tax Act, signed into law on December 22, 2017, adopting broad U.S. corporate income tax reform, among other things, reduced the U.S. corporate income tax rate, but imposed base-erosion prevention measures on non-U.S. earnings of U.S. entities as well as a one-time mandatory deemed repatriation tax on accumulated non-U.S. earnings of U.S. entities.

In addition, many countries are beginning to implement legislation and other guidance to align their international tax rules with the Organization for Economic Co-operation and Development's Base Erosion and Profit Shifting recommendations and action plan that aim to standardize and modernize global corporate tax policy, including changes to cross-border tax, transfer-pricing documentation rules, and nexus-based tax incentive practices.

Such legislative initiatives may materially and adversely affect our plans to expand internationally and may negatively impact our financial condition and results of operations generally.

Our inability to collect on our accounts receivable by a significant number of customers may have an adverse effect on our business, financial condition and results of operations.

Sales to our customers are generally made on open credit terms. Management maintains an allowance for potential credit losses. If our customers' cash flow, working capital, financial conditions or results of operations deteriorate, they may be unable or even unwilling to pay trade receivables owed to us promptly or at all. As a result, we could be exposed to a certain level of credit risk. If a major customer experiences, or a significant number of customers experience, financial difficulties, the effect on us could be material and have an adverse effect on our business, financial condition and results of operations.

Risks related to being a public company

If we fail to maintain proper and effective internal controls, our ability to produce accurate financial statements on a timely basis could be impaired, which would adversely affect our business.

As a public company, we are required to comply with Section 404 of the Sarbanes Oxley Act of 2002 ("SOX"), which requires, among other things, that companies maintain disclosure controls and procedures to ensure timely disclosure of material information, and that management review the effectiveness of those controls on a quarterly basis and that our independent registered public accounting firm provide an attestation report on the effectiveness of our internal control over financial reporting in this Annual Report on Form 10-K, among other additional requirements. Effective internal controls are necessary for us to provide reliable financial reports and to help prevent fraud, and our management and other personnel devote a substantial amount of time to these compliance requirements. These rules and regulations also increase our legal and financial compliance costs and make some activities more time-consuming and costly.

We cannot be certain that we will be able to maintain adequate controls over our financial processes and reporting in the future. For example, as previously disclosed in our annual reports on Form 10-K for the fiscal years ended September 30, 2020, 2021, 2022 and 2023 we had at least one material weakness in our internal control over financial reporting as of the end of each of these fiscal years. Although management has since remediated these material weaknesses and concluded that our internal control over financial reporting was effective as of September 30, 2024, weaknesses in our internal control over financial reporting could again be discovered in the future. If we fail to maintain effective internal controls, investors may lose confidence in the accuracy and completeness or our financial reports, the market price of our securities may be negatively affected, and we could be subject to sanctions or investigation by regulatory authorities, such as the SEC or Nasdaq.

The requirements of being a public company may strain our resources and require a substantial amount of management's attention.

As a public company, we are subject to the reporting requirements of the Exchange Act, the Sarbanes-Oxley Act, the Dodd-Frank Wall Street Reform and Consumer Protection Act, or the Dodd-Frank Act, Nasdaq listing requirements and other applicable securities rules and regulations. The SEC and other regulators have continued to adopt new rules and regulations and make additional changes to existing regulations that require our compliance. Stockholder activism, the current political environment, and the current high level of government intervention and regulatory reform may lead to

substantial new regulations and disclosure obligations, which may lead to additional compliance costs and impact, in ways we cannot currently anticipate, the manner in which we operate our business. Compliance with these rules and regulations may cause us to incur additional accounting, legal and other expenses. We also incur costs associated with corporate governance requirements, including requirements under securities laws, as well as rules and regulations implemented by the SEC and Nasdaq, particularly as a large accelerated filer. These rules and regulations have increased our legal and financial compliance costs and we devote significant time to comply with these requirements. We are currently evaluating and monitoring developments with respect to these rules and regulations, and we cannot predict or estimate the amount of additional costs we may incur or the timing of such costs.

Risks related to our intellectual property

Our ability to protect our intellectual property and proprietary technology through patents and other means is uncertain.

Our commercial success depends in part on our ability to protect our intellectual property and proprietary technologies. We rely on patent protection, where appropriate and available, as well as a combination of copyright, trade secret and trademark laws, and nondisclosure, confidentiality and other contractual restrictions to protect our proprietary technology. However, these legal means afford only limited protection and may not adequately protect our rights or permit us to gain or keep any competitive advantage.

Worldwide, we own or exclusively in-license over 150 issued or allowed patents and more than 250 pending patent applications as of September 30, 2024. In addition to these owned and exclusively licensed patents and pending patent applications, we also license patents on a non-exclusive and/or territory restricted basis. Our intellectual property portfolio includes important patents and patent applications directed to DNA synthesis, Next Generation Sequencing, antibody libraries, and DNA data storage.

Several patent applications covering our technologies have been filed recently. We cannot offer any assurances about which, if any, patents will issue, the breadth of any such patent, or whether any issued patents will be found invalid and unenforceable or will be threatened by third parties. Any successful opposition to these patents or any other patents owned by or, if applicable in the future, licensed to us could deprive us of rights necessary for the practice of our technologies or the successful commercialization of products that we may develop. Since patent applications in the United States and most other countries are confidential for a period of time after filing, we cannot be certain that we were the first to file any patent application related to our technologies or products. Furthermore, an interference proceeding can be provoked by a third party or instituted by the U.S. Patent and Trademark Office ("USPTO"), or the European Patent Office ("EPO"), to determine who was the first to invent any of the subject matter covered by the patent claims of our applications. For example, on March 3, 2021, our European Patent No. 3030682 which relates to polynucleotide synthesis was opposed by an anonymous third party. An initial decision to revoke the patent was issued on November 29, 2022, which will not become final until all appeals are exhausted. We believe the EPO's decision relating to the original claims is erroneous and we appealed the EPO’s decision on January 27, 2023. The opponent filed a reply to the appeal on August 2, 2023. On April 205, 2024, the EOP issued a summons for an oral hearing for May 6, 2025, and the appeal remains pending. We continue to prosecute related pending European applications.

Patent law can be highly uncertain and involve complex legal and factual questions for which important principles remain unresolved. In the United States and in many international jurisdictions, policy regarding the breadth of claims allowed in patents can be inconsistent. The U.S. Supreme Court and the Court of Appeals for the Federal Circuit have made, and will likely continue to make, changes in how the patent laws of the United States are interpreted. Similarly, international courts have made, and will likely continue to make, changes in how the patent laws in their respective jurisdictions are interpreted. 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 international legislative bodies.

If we are unable to obtain, maintain and enforce intellectual property protection, others may be able to make, use, or sell products and technologies substantially the same as ours, which could adversely affect our ability to compete in the market.

We may not pursue or maintain patent protection for our products in every country or territory in which we sell our products and technologies. In addition, our pending U.S. and foreign patent applications may not issue as patents or may not issue in a form that will be sufficient to protect our proprietary technology and gain or keep our competitive advantage. Any patents we have obtained or do obtain may be subject to re-examination, reissue, opposition or other administrative proceedings, or may be challenged in litigation, and such challenges could result in a determination that the patent is invalid or unenforceable.

Patents have a limited lifespan. Patent terms may be shortened or lengthened by, for example, terminal disclaimers, patent term adjustments, supplemental protection certificates, and patent term extensions. Although extensions may be available,

the life of a patent, and the protection it affords, is limited. Patent term extensions and supplemental protection certificates, and the like, may be impacted by the regulatory process and may not significantly lengthen patent term. Non-payment or delay in payment of patent fees or annuities, delay in patent filings or delay in extension filing, whether intentional or unintentional, may also result in the loss of patent rights important to our business. In such an event, competitors might be able to enter the market earlier than would otherwise have been the case. In addition, certain countries have compulsory licensing laws under which a patent owner may be compelled to grant licenses to other parties. Furthermore, many countries limit the enforceability of patents against other parties, including government agencies or government contractors. In these countries, the patent owner may have limited remedies, which could materially diminish the value of any patents.

We cannot be certain that the steps we have taken will prevent unauthorized use or unauthorized reverse engineering of our technology. In addition, competitors may be able to design alternative methods or devices that avoid infringement of our patents. To the extent our intellectual property, including licensed intellectual property, offers inadequate protection, or is found to be invalid or unenforceable, we are exposed to a greater risk of direct competition. If our intellectual property does not provide adequate protection against our competitors' products, our competitive position could be adversely affected, as could our business. Both the patent application process and the process of managing patent disputes can be time consuming and expensive.

Monitoring unauthorized use of our intellectual property is difficult and costly. From time to time, we review our competitors' products, and may in the future seek to enforce our patents or other rights against potential infringement. However, the steps we have taken to protect our proprietary rights may not be adequate to prevent misappropriation of our intellectual property. We may not be able to detect unauthorized use of, or take appropriate steps to enforce, our intellectual property rights. We cannot guarantee that any of our patent searches or analyses, including but not limited to the identification of relevant patents, the scope of patent claims or the expiration of relevant patents, are complete or thorough, nor can we be certain that we have identified each and every third-party patent and pending application in the United States and abroad that is relevant to or necessary for the commercialization of our products in any jurisdiction. For example, U.S. applications filed before November 29, 2000 and certain U.S. applications filed after that date that will not be filed outside the United States remain confidential until patents issue. Patent applications in the United States and elsewhere are published approximately 18 months after the earliest filing for which priority is claimed. Therefore, patent applications covering our product candidates or technologies could have been filed by others without our knowledge. Additionally, pending patent applications that have been published can, subject to certain limitations, be later amended in a manner that could cover our platform technologies, our products or the use of our products or technologies. The scope of a patent claim is determined by the interpretation of the law, the written disclosure in a patent and the patent's prosecution history. Our interpretation of the relevance or the scope of a patent or a pending application may be incorrect, which may negatively impact our ability to market our products. We may incorrectly determine that our products are not covered by a third-party patent or may incorrectly predict whether a third party's pending application will issue with claims of relevant scope. Our determination of the expiration date of any patent in the United States or abroad that we consider relevant may be incorrect, which may negatively impact our ability to develop and market our product candidates.

A court or other judicial body may decide that the patent we seek to enforce is invalid or unenforceable or may refuse to stop the other party from using the technology at issue on the grounds that the patent in question does not cover the technology in question. An adverse result in any litigation could put one or more of our patents at risk of being invalidated or interpreted narrowly. Some of our competitors may be able to devote significantly more resources to intellectual property litigation and may have significantly broader patent portfolios to assert against us if we assert our rights against them.

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

Filing, prosecuting and defending patents on our technologies and products in all countries throughout the world would be prohibitively expensive. In addition, the laws of some non-U.S. countries do not protect intellectual property rights to the same extent as the laws of the United States, and many companies have encountered significant problems in protecting and defending such rights in foreign jurisdictions. Consequently, we may not be able to prevent third parties from using our inventions in countries outside the United States, or from selling or importing products made using our inventions in and into the United States or other jurisdictions. Competitors may use our technologies in jurisdictions where we have not obtained patent protection to develop their own technologies and products and, may export otherwise infringing products to territories where we have patent protection. These products may compete with our products, and our patents or other intellectual property rights may not be effective or sufficient to prevent them from competing.

The legal systems of certain countries, particularly China and certain other developing countries, do not favor the enforcement of patents and other intellectual property protection, particularly those relating to biotechnology, which could make it difficult for us to stop the infringement of our patents. Proceedings to enforce our patent rights in foreign jurisdictions could result in substantial cost and divert our efforts and attention from other aspects of our business, put our

own patents at risk of being invalidated or interpreted narrowly, put our patent applications at risk of not being issued, and provoke third parties to assert claims against us. We may not prevail in any lawsuits that we initiate, and the damages or other remedies awarded, if any, may not be commercially meaningful. Accordingly, our efforts to enforce our intellectual property rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property that we develop. Certain countries in Europe and developing countries, including China and India, have compulsory licensing laws under which a patent owner may be compelled to grant licenses to third parties. In those countries, we may have limited remedies if any of our patents are infringed or if we are compelled to grant a license to a third party, which could materially diminish the value of those patents. This could limit our potential revenue opportunities. Accordingly, our efforts to enforce our intellectual property rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property that we develop or license.

If we are unable to protect the confidentiality of our proprietary information and know-how, the value of our technology and products could be adversely affected.

In addition to pursuing patents on our technology, we take steps to protect our intellectual property and proprietary technology by entering into confidentiality agreements and intellectual property assignment agreements with our employees, consultants, corporate partners and, when needed, our advisors. Such agreements may not be enforceable or may not provide meaningful protection for our trade secrets or other proprietary information in the event of unauthorized use or disclosure or other breaches of the agreements, and we may not be able to prevent such unauthorized disclosure. Monitoring unauthorized disclosure is difficult, and we do not know whether the steps we have taken to prevent such disclosure are, or will be, adequate. If we were to enforce a claim that a third party had illegally obtained and was using our trade secrets, it would be expensive and time consuming, and the outcome would be unpredictable. In addition, courts outside the United States may be less willing to protect trade secrets.

Trade secrets and know-how can be difficult to protect as trade secrets, and know-how will over time be disseminated within the industry through independent development, the publication of journal articles, and the movement of personnel skilled in the art from company to company. In addition, because we may rely on third parties in the development of our products, we may, at times, share trade secrets with them. We seek to protect our proprietary technology in part by entering into confidentiality agreements and, if applicable, material transfer agreements, consulting agreements or other similar agreements with third parties prior to beginning research or disclosing proprietary information. These agreements typically limit the rights of the third parties to use or disclose our confidential information, including our trade secrets. Despite the contractual provisions employed when working with third parties, the need to share trade secrets and other confidential information increases the risk that such trade secrets become known by our competitors, are inadvertently incorporated into the technology of others, or are disclosed or used in violation of these agreements. If we are unable to prevent unauthorized material disclosure of the intellectual property related to our technologies to third parties, we will not be able to establish or maintain a competitive advantage in our market, which could materially adversely affect our business, results of operations and financial condition.

Despite our efforts to protect our trade secrets, our competitors may discover our trade secrets, either lawfully or through breach of our agreements with third parties, independent development or publication of information by any of our third-party collaborators. Competitors could willfully infringe our intellectual property rights, design around our protected technology or develop their own competitive technologies that fall outside of our intellectual property rights. In addition, if any of our trade secrets were to be lawfully obtained or independently developed by a competitor, we would have no right to prevent such competitor from using that technology or information to compete with us, which could harm our competitive position. Given that our proprietary position is based, in part, on our know-how and trade secrets, a competitor's discovery of our trade secrets or other unauthorized use or disclosure would impair our competitive position and may have an adverse effect on our business and results of operations.

We may be involved in lawsuits to protect or enforce our patents and proprietary rights, to determine the scope, coverage and validity of others' proprietary rights, or to defend against third party claims of intellectual property infringement that could require us to spend significant time and money and could prevent us from selling our products or impact our stock price.

Litigation may be necessary for us to enforce our patent and proprietary rights and/or to determine the scope, coverage and validity of others' proprietary rights. Litigation on these matters has been prevalent in our industry and we expect that this will continue. As the biotechnology and synthetic biology industries expand and more patents are issued, the risk increases that there may be patents issued to third parties that relate to our technologies and products of which we are not aware or that we may need to challenge to continue our operations as currently contemplated. In addition, our competitors and others may have patents or may in the future obtain patents and claim that the use of our products or processes infringes these patents. As we move into new markets and applications for our products and processes, incumbent participants in such

markets may assert their patents and other proprietary rights against us as a means of slowing our entry into such markets or as a means to extract substantial license and royalty payments from us.

Patent infringement suits can be expensive, lengthy and disruptive to business operations and the outcome following legal assertions of invalidity and unenforceability is unpredictable. We could incur substantial costs and divert the attention of our management and technical personnel in prosecuting or defending against any claims and may harm our reputation. Some of our competitors may be able to sustain the costs of complex patent litigation more effectively than we can because they have substantially greater resources. There can be no assurance that we will prevail in any suit initiated against us by third parties, successfully settle or otherwise resolve patent infringement claims. If we are unable to successfully settle claims on terms acceptable to us, we may be required to engage in or continue costly, unpredictable and time-consuming litigation and may be prevented from or experience substantial delays in marketing our technologies and products. Furthermore, parties making claims against us may be able to obtain injunctive or other relief, which could block our ability to develop, commercialize and sell products, and could result in the award of substantial damages against us, including treble damages and attorneys' fees and costs in the event that we are found to be a willful infringer of third party patents.

In the event of a successful claim of infringement against us, we may be required to obtain one or more licenses from third parties, which we may not be able to obtain at a reasonable cost, if at all. We could therefore incur substantial costs related to royalty payments for licenses obtained from third parties, which could negatively affect our gross margins. In addition, we could encounter delays in product introductions while we attempt to develop alternative methods or products to avoid infringing third-party patents or proprietary rights. Defense of any lawsuit or failure to obtain any required licenses on favorable terms could prevent us from commercializing our products, and the risk of a prohibition on the sale of any of our products could adversely affect our ability to grow and gain market acceptance for our products.

Suppliers of certain equipment and technology platforms on which we rely for our business may also be subject to patent infringement lawsuits. Even if we are not a named party in such lawsuits, if such suppliers are enjoined by a court to stop selling their equipment and technology platforms or supporting our existing equipment and technology platforms, we may not have an alternative source for such equipment and technology platforms, which may have a material adverse effect on our business.

We may also be subject to claims that former employees, collaborators or other third parties have an ownership interest in our patents or other intellectual property. We were previously involved in litigation of this kind with Agilent. While we have settled this dispute, there can be no assurance that future litigation will not be initiated by these parties. Some of our employees were previously employed at universities or biotechnology or biopharmaceutical companies, including our competitors or potential competitors. We may be subject to claims that these employees or we have inadvertently or otherwise used or disclosed trade secrets or other proprietary information of their former employers. Litigation may be necessary to defend against these and other claims challenging inventorship or ownership. If we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights. A loss of key research personnel or their work product could hamper our ability to commercialize, or prevent us from commercializing, our products and technologies. Such an outcome could have a material adverse effect on our business. Even if we are successful in defending against such claims, litigation could result in substantial costs and distraction to management and other employees.

Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation, there is a risk that some of our confidential information could be compromised by disclosure during this type of litigation. In addition, during the course of this kind of litigation, there could be public announcements of the results of hearings, motions or other interim proceedings or developments. 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 operating losses and reduce the resources available for development activities or any future sales, marketing or distribution activities. Finally, any uncertainties resulting from the initiation and continuation of any litigation could have a material adverse effect on our ability to raise the funds necessary to continue our operations.

In addition, our agreements with some of our suppliers, distributors, customers and other entities with whom we do business may require us to defend or indemnify these parties to the extent they become involved in infringement claims against us, including the claims described above. We could also voluntarily agree to defend or indemnify third parties in instances where we are not obligated to do so if we determine it would be important to our business relationships. If we are required or agree to defend or indemnify any of these third parties in connection with any infringement claims, we could incur significant costs and expenses that could adversely affect our business, operating results, or financial condition.

We may not be successful in obtaining or maintaining necessary rights to our products and technologies through acquisitions and in-licenses, and our intellectual property agreements with third parties may involve unfavorable terms or be subject to disagreements over contract interpretation.

We may find that our programs require the use of proprietary rights held by third parties, and the growth of our business may depend in part on our ability to acquire, in-license or use these proprietary rights. We may be unable to acquire or in-license compositions, methods of use, processes or other third-party intellectual property rights from third parties that we identify as necessary for our products and technologies. The licensing and acquisition of third-party intellectual property rights is a competitive area, and other companies may also be pursuing strategies to license or acquire third-party intellectual property rights that we may consider attractive. These companies may have a competitive advantage over us due to their size, financial resources and greater commercialization capabilities. In addition, companies that perceive us to be a competitor may be unwilling to assign or license rights to us. Moreover, collaboration arrangements are complex and time-consuming to negotiate, document, implement and maintain. We may not be successful in our efforts to establish and implement collaborations or other alternative arrangements should we so choose to enter into such arrangements. We also may be unable to license or acquire third-party intellectual property rights on terms that would be favorable to us or would allow us to make an appropriate return on our investment.

We engage in discussions regarding other possible commercial and cross-licensing agreements with third parties from time to time. There can be no assurance that these discussions will lead to the execution of commercial license or cross-license agreements or that such agreements will be on terms that are favorable to us. Even if we are able to obtain a license to intellectual property of interest, we may not be able to secure exclusive rights, in which case others could use the same rights and compete with us. In addition, if we enter into cross-licensing agreements, there is no assurance that we will be able to effectively compete against others who are licensed under our patents.

In addition, provisions in our licensing and other intellectual property agreements may be susceptible to multiple interpretations. The resolution of any contract interpretation disagreement that may arise could affect the scope of our rights to the relevant intellectual property or technology or affect financial or other obligations under the relevant agreement, either of which could have a material adverse effect on our business, financial condition, results of operations and prospects.

We have not yet registered some of our trademarks in all of our potential markets, and failure to secure those registrations could adversely affect our business.

Some of our trademark applications may not be allowed for registration, and our registered trademarks may not be maintained or enforced. In addition, in the U.S. Patent and Trademark Office and in comparable agencies in many foreign jurisdictions, third parties are given an opportunity to oppose pending trademark applications and to seek to cancel registered trademarks. Opposition or cancellation proceedings may be filed against our trademarks, and our trademarks may not survive such proceedings.

In addition, third parties may file first for our trademarks in certain countries. If they succeed in registering such trademarks, and if we are not successful in challenging such third-party rights, we may not be able to use these trademarks for marketing our products and technologies in those countries. Over the long-term, if we are unable to establish name recognition based on our trademarks, then our marketing abilities may be materially adversely impacted.

We depend on certain technologies that are licensed to us. We do not control these technologies and any loss of our rights to them could prevent us from selling our products.

We rely on, or may in the future rely on, licenses in order to be able to use various proprietary technologies that are material to our business. We do not or will not own the patents that underlie these licenses. Our rights to use the technology we license are subject to the negotiation of, continuation of and compliance with the terms of those licenses. In some cases, we do not or will not control the prosecution, maintenance, or filing of the patents to which we hold licenses, or the enforcement of these patents against third parties. Some of our patents and patent applications were either acquired from another company who acquired those patents and patent applications from yet another company or are licensed from a third party. For example, Twist Bioscience acquired Genome Compiler Corporation in 2016, and Genome Compiler had a non-exclusive license to U.S. Patent No- 7,805,252 owned by DNA 2.0. Thus, these patents and patent applications are not written by us or our attorneys, and we did not have control over the drafting and prosecution. The former patent owners and our licensors might not have given the same attention to the drafting and prosecution of these patents and applications as we would have if we had been the owners of the patents and applications and had control over the drafting and prosecution. We cannot be certain that drafting and/or prosecution of the licensed patents and patent applications by the licensors have been or will be conducted in compliance with applicable laws and regulations or will result in valid and enforceable patents and other intellectual property rights.

Our rights to use the technology we license is subject to the validity of the owner’s intellectual property rights. Enforcement of our licensed patents or defense or any claims asserting the invalidity of these patents is often subject to the control or cooperation of our licensors. Legal action could be initiated against the owners of the intellectual property that we license. Even if we are not a party to these legal actions, an adverse outcome could harm our business because it might

prevent these other companies or institutions from continuing to license intellectual property that we may need to operate our business.

Our licenses contain or will contain provisions that allow the licensor to terminate the license upon specific conditions. Our rights under the licenses are subject to or will be subject to our continued compliance with the terms of the license, including the payment of royalties due under the license. Termination of these licenses could prevent us from marketing some or all of our products. Because of the complexity of our products and the patents we have licensed, determining the scope of the license and related royalty obligation can be difficult and can lead to disputes between us and the licensor. An unfavorable resolution of such a dispute could lead to an increase in the royalties payable pursuant to the license. If a licensor believed we were not paying the royalties due under the license or were otherwise not in compliance with the terms of the license, the licensor might attempt to revoke the license. If such an attempt were successful, we might be barred from producing and selling some or all of our products.

Risks relating to owning our common stock

We have never paid dividends on our capital stock and we do not intend to pay dividends for the foreseeable future. Consequently, any gains from an investment in our common stock will likely depend on whether the price of our common stock increases.

We have never declared or paid any dividends on our common stock and do not intend to pay any dividends in the foreseeable future. We anticipate that we will retain all of our future earnings for use in the operation of our business and for general corporate purposes. Any determination to pay dividends in the future will be at the discretion of our board of directors. Accordingly, investors must rely on sales of their common stock after any price appreciation as the only way to realize any future gains on their investments.

Our charter documents and Delaware law could prevent a takeover that stockholders consider favorable and could also reduce the market price of our stock.

Our amended and restated certificate of incorporation and our amended and restated bylaws contain provisions that could delay or prevent a change in control of our Company. These provisions could also make it more difficult for stockholders to elect directors and take other corporate actions. These provisions include:

- providing for a classified board of directors with staggered, three-year terms;
- authorizing our board of directors to issue preferred stock with voting or other rights or preferences that could discourage a takeover attempt or delay changes in control;
- prohibiting cumulative voting in the election of directors;
- providing that vacancies on our board of directors may be filled only by a majority of directors then in office, even though less than a quorum;
- prohibiting the adoption, amendment or repeal of our amended and restated bylaws or the repeal of the provisions of our amended and restated certificate of incorporation regarding the election and removal of directors without the required approval of at least 66.67% of the shares entitled to vote at an election of directors;
- prohibiting stockholder action by written consent;
- limiting the persons who may call special meetings of stockholders; and
- requiring advance notification of stockholder nominations and proposals.

These provisions may 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 of directors, which is responsible for appointing the members of our management. In addition, the provisions of Section 203 of the Delaware General Corporate Law, or the DGCL, govern us. These provisions may prohibit large stockholders, in particular those owning 15% or more of our outstanding voting stock, from merging or combining with us for a certain period of time without the consent of our board of directors.

These and other provisions in our amended and restated certificate of incorporation and our amended and restated bylaws and under Delaware law could discourage potential takeover attempts, reduce the price investors might be willing to pay in the future for shares of our common stock and result in the market price of our common stock being lower than it would be without these provisions.

Our amended and restated certificate of incorporation provides that the Court of Chancery of the State of Delaware and the federal district courts of the United States will be the 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 or our directors, officers or other employees.

Our amended and restated certificate of incorporation provides that the Court of Chancery of the State of Delaware is the sole and exclusive forum for any derivative action or proceeding brought on our behalf, any action asserting a breach of fiduciary duty owed by any of our directors, officers or other employees to us or our stockholders, any action asserting a claim against us arising pursuant to any provisions of the DGCL, our amended and restated certificate of incorporation or our amended and restated bylaws, any action or proceeding asserting a claim as to which the Delaware General Corporation Law confers jurisdiction upon the Court of Chancery of the State of Delaware or any action asserting a claim against us that is governed by the internal affairs doctrine, subject in each case to the Court of Chancery having personal jurisdiction over the parties named as defendants therein. The exclusive forum provision will not apply to suits brought to enforce any liability or duty created by the Exchange Act or any other claim for which the federal courts have exclusive jurisdiction. The choice of forum provision may limit a stockholder's ability to bring a claim in a judicial forum that it finds favorable for disputes with us or our directors, officers or other employees, which may discourage such lawsuits against us and our directors, officers and other employees. If a court were to find the choice of forum provision contained in our amended and restated certificate of incorporation to be inapplicable or unenforceable in an action, we might incur additional costs associated with resolving such action in other jurisdictions.

In addition, our amended and restated certificate of incorporation provides that the U.S. federal district courts are the exclusive forum for the resolution of any complaint asserting a cause of action arising under the Securities Act. Our exclusive forum provision will not relieve us of our duties to comply with the federal securities laws and the rules and regulations thereunder, and our stockholders will not be deemed to have waived our compliance with these laws, rules and regulations.

The enforceability of similar federal court choice of forum provisions in other companies' certificates of incorporation has been challenged in legal proceedings, and it is possible that a court could find our federal court choice of forum provision to be inapplicable or unenforceable. If a court were to find either of the choice of forum provisions contained in our amended and restated certificate of incorporation to be inapplicable or unenforceable in an action, we may incur additional costs associated with resolving such action in other jurisdictions. Additionally, while the Delaware Supreme Court recently determined that choice of forum provisions for actions arising under the Securities Act are facially valid, a stockholder may nevertheless seek to bring such a claim arising under the Securities Act against us, our directors, officers, or other employees in a venue other than in the federal district courts of the United States. In such instance, we would expect to vigorously assert the validity and enforceability of the exclusive forum provisions of our amended and restated certificate of incorporation, and this may require significant additional costs associated with resolving such action in other jurisdictions.

General risk factors

The market price of our common stock is likely to be volatile and could fluctuate or decline, resulting in a substantial loss of your investment.

The market price of our common stock could be subject to wide fluctuations in response to, among other things, the factors described in this "Risk factors" section or otherwise, and other factors beyond our control, such as fluctuations in the valuations of companies perceived by investors to be comparable to us.

Furthermore, the stock markets have experienced price and volume fluctuations that have affected and continue to affect the market prices of equity securities of many companies. These fluctuations often have been unrelated or disproportionate to the operating performance of those companies. These broad market fluctuations, as well as general economic, systemic, political and market conditions, such as recessions, interest rate changes or international currency fluctuations, may negatively affect the market price of our common stock.

Factors that could cause the market price of our common stock to fluctuate significantly include:

- actual or anticipated fluctuations in our financial condition and operating results, including fluctuations in our quarterly and annual results;
- announcements of technological innovations by us or our competitors;
- overall conditions in our industry and the markets in which we operate;
- addition or loss of significant customers, or other developments with respect to significant customers;
- changes in laws or regulations applicable to our products;
- actual or anticipated changes in our growth rate relative to our competitors;
- announcements by us or our competitors of significant acquisitions, strategic partnerships, joint ventures or capital commitments;
- additions or departures of key personnel;
- operational impacts resulting from a reduction in force;
- competition from existing products or new products that may emerge;
- issuance of new or updated research or reports by securities analysts;
- fluctuations in the valuation of companies perceived by investors to be comparable to us;
- disputes or other developments related to proprietary rights, including patents, litigation matters and our ability to obtain intellectual property protection for our technologies;
- announcement or expectation of additional financing efforts;
- sales of our common stock by us or our stockholders;
- the addition or removal of our stock to or from a stock index fund;
- share price and volume fluctuations attributable to inconsistent trading volume levels of our shares;
- the expiration of contractual lock-up agreements with our executive officers, directors and stockholders, which we may enter into in the future from time to time;
- general economic and market conditions, including economic downturns or uncertainty in financial markets; and
- other factors beyond our control, such as terrorism, war, natural disasters and pandemics.

In the past, many companies that have experienced volatility in the market price of their stock have become subject to securities class action litigation. We are now and may in the future be the target of this type of litigation. Securities

litigation against us could result in substantial costs and divert our management's attention from other business concerns, which could harm our business.

Our quarterly and annual operating results and cash flows have fluctuated in the past and might continue to fluctuate, causing the value of our common stock to decline substantially.

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

Our operating results have varied in the past. As a result, our operating results could be unpredictable, particularly on a quarterly basis. In addition to other risk factors listed in this section, some of the important factors that may cause fluctuations in our quarterly and annual operating results are further described in "Risk factors—Risks relating to owning our stock."

In addition, a significant portion of our operating expense is relatively fixed in nature, and planned expenditures are based in part on expectations regarding future revenue. Accordingly, unexpected revenue shortfalls will decrease our gross margins and could cause significant changes in our operating results from quarter to quarter. If this occurs, the trading price of our common stock could fall substantially.

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

The trading market for our common stock will depend on the research and reports that securities or industry analysts publish about us or our business and we will not have any control over such analysts. If one or more of the analysts who cover us downgrade our shares or change their opinion of our shares, our share 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 share price or trading volume to decline.

Our actual operating results may differ significantly from our guidance.

From time to time, we may release guidance in our quarterly earnings conference calls, quarterly earnings releases, or otherwise, regarding our future performance that represents our management's estimates as of the date of release. This guidance, which includes forward-looking statements, is based on projections prepared by our management. This guidance is not prepared with a view toward compliance with published guidelines of the American Institute of Certified Public Accountants (AICPA) regarding projections or the SEC regarding forward-looking statements, and neither our independent registered public accounting firm nor any other independent expert or outside party compiles or examines the projections. Accordingly, no such person will express any opinion or any other form of assurance with respect to the projections.

Projections are based upon a number of assumptions and estimates that, while presented with numerical specificity, are inherently subject to significant business, economic and competitive uncertainties and contingencies, many of which are beyond our control and are based upon specific assumptions with respect to future business decisions, some of which will change. Our aim is to state possible outcomes as high and low ranges to provide a sensitivity analysis as variables are changed but are not intended to imply that actual results could not fall outside of the suggested ranges. The principal reason that we release guidance is to provide a basis for our management to discuss our business outlook with analysts and investors. We do not accept any responsibility for any projections or reports published by any such third parties.

Guidance is necessarily speculative in nature, and it can be expected that some or all of the assumptions underlying the guidance furnished by us will not materialize or will vary significantly from actual results. Accordingly, our guidance is only an estimate of what management believes is realizable as of the date of release. Actual results may vary from our guidance and the variations may be material. In light of the foregoing, investors are urged not to rely upon our guidance in making an investment decision regarding our common stock.

Any failure to successfully implement our operating strategy or the occurrence of any of the events or circumstances set forth in the "Risk factors" section in this Form 10-K could result in the actual operating results being different from our guidance, and the differences may be adverse and material.

We have in the past and may in the future be subject to short selling strategies that may drive down the market price of our common stock.

Short sellers have in the past and may attempt in the future to drive down the market price of our common stock. Short selling is the practice of selling securities that the seller does not own but may have borrowed with the intention of buying identical securities back at a later date. The short seller hopes to profit from a decline in the value of the securities between the time the securities are borrowed and the time they are replaced. As it is in the short seller's best interests for the price of the stock to decline, many short sellers (sometime known as "disclosed shorts") publish, or arrange for the publication of, negative opinions regarding the relevant issuer and its business prospects to create negative market momentum. Although traditionally these disclosed shorts were limited in their ability to access mainstream business media or to otherwise create negative market rumors, the rise of the Internet and technological advancements regarding document creation, videotaping and publication by weblog ("blogging") have allowed many disclosed shorts to publicly attack a company's credibility, strategy and veracity by means of so-called "research reports" that mimic the type of investment analysis performed by large Wall Street firms and independent research analysts. These short attacks have, in the past, led to selling of shares in the market. Further, these short seller publications are not regulated by any governmental, self-regulatory organization or other official authority in the U.S. and they are not subject to certification requirements imposed by the SEC. Accordingly, the opinions they express may be based on distortions, omissions or fabrications. Companies that are subject to unfavorable allegations, even if untrue, may have to expend a significant amount of resources to investigate such allegations and/or defend themselves, including shareholder suits against the company that may be prompted by such allegations. We have been and may in the future be the subject of shareholder suits that we believe were prompted by allegations made by short sellers.

Future sales and issuances of our common stock or rights to purchase common stock, including pursuant to our equity incentive plans, could result in additional dilution of the percentage ownership of our stockholders and could cause the stock price of our common stock to decline.

As we have in the past, we may sell common stock, convertible securities or other equity securities in one or more transactions at prices and in a manner, we determine from time to time. We have also issued and expect to issue common stock to employees and directors pursuant to our equity incentive plans. If we sell common stock, convertible securities or other equity securities in future transactions, or common stock is issued pursuant to equity incentive plans, investors may be materially diluted. New investors in such subsequent transactions could gain rights, preferences and privileges senior to those of holders of our common stock.

Claims for indemnification by our directors and officers may reduce our available funds to satisfy successful third-party claims against us and may reduce the amount of money available to us.

Our amended and restated certificate of incorporation and amended and restated bylaws provide that we will indemnify our directors and officers, in each case to the fullest extent permitted by Delaware law.

In addition, as permitted by Section 145 of the DGCL, our amended and restated bylaws and our indemnification agreements that we have entered into with our directors and officers provide that:

- we will indemnify our directors and officers for serving us in those capacities or for serving other business enterprises at our request, to the fullest extent permitted by Delaware law, which provides that a corporation may indemnify such person if such person acted in good faith and in a manner such person reasonably believed to be in or not opposed to the best interests of the registrant and, with respect to any criminal proceeding, had no reasonable cause to believe such person's conduct was unlawful;

- we may, in our discretion, indemnify employees and agents in those circumstances where indemnification is permitted by applicable law;

- we are required to advance expenses, as incurred, to our directors and officers in connection with defending a proceeding, except that such directors or officers shall undertake to repay such advances if it is ultimately determined that such person is not entitled to indemnification;

- we will not be obligated pursuant to our amended and restated bylaws to indemnify a person with respect to proceedings initiated by that person against us or our other indemnitees, except with respect to proceedings authorized by our board of directors or brought to enforce a right to indemnification;

- the rights conferred in our amended and restated bylaws are not exclusive, and we are authorized to enter into indemnification agreements with our directors, officers, employees and agents and to obtain insurance to indemnify such persons; and

- we may not retroactively amend our amended and restated bylaw provisions to reduce our indemnification obligations to directors, officers, employees and agents.

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. Certain institutional investors, investment funds, other influential investors, customers, suppliers and other third parties are also increasingly focused on ESG practices. Companies that do not adapt to or comply with the evolving investor or stakeholder expectations and standards, or which are perceived to have not responded appropriately, may suffer from reputational damage and result in the business, financial condition and/or stock price of a company being materially and adversely affected. Further, this increased focus on ESG issues may result in new regulations and/or third-party requirements that could adversely impact our business, or certain stockholders reducing or eliminating their holdings of our stock. Additionally, an allegation or perception that we have not taken sufficient action in these areas could negatively harm our reputation.

Item 1B. ***Unresolved staff comments***

None.

Item 1C. Cybersecurity

Cybersecurity Risk Management and Strategy

Processes Used to Assess, Identify, and Manage Material Risks from Cybersecurity Threats

Risk Assessment and Management

We have implemented and maintain various information security processes designed to identify, assess and manage material risks from cybersecurity threats to our critical computer networks, third-party hosted services, communications systems, hardware and software, and our critical data, including, among other things, intellectual property, trade secrets, confidential information that is proprietary, strategic or competitive in nature, and personal data.

Our Chief Information Officer ("CIO") together with our Senior Director of IT Infrastructure, Security and Compliance and other members of the Information and Business Technology ("IBT") Security team, are responsible for establishing and implementing cybersecurity policies and procedures, which includes developing and updating our Security Incident Response Policy ("IRP"), managing incident response, and overseeing any policy exceptions and potential compensating controls.

Our cybersecurity program is based on the International Organization for Standardization ("ISO") 27001 security controls. We maintain an ISO 27001:2022 certification and we undergo routine audits by an independent, certified accreditation body to maintain this certification. We also provide annual, mandatory cybersecurity training for employees to equip our workforce with the knowledge to identify and respond to cybersecurity threats, such as phishing attempts.

Our process for assessing, identifying, and managing material risks from cybersecurity threats is integrated into our overall enterprise risk management process. As part of our overall enterprise risk management process, we have a cybersecurity risk management strategy based on National Institute of Standards and Technology (NIST) Special Publication. 800-30 "Guide for Conducting Risk Assessments" that provide guidelines and principles for information technology security risk management.

Incident Response

We have a dedicated Information Security team within the IBT team responsible for managing and coordinating incident response efforts. This team collaborates closely with other teams within the company, including Legal and Finance, in identifying, analyzing, and responding to cybersecurity incidents, which includes tracking cybersecurity incidents to help identify any related incidents. When cybersecurity incidents are identified, our practice is to respond to and address them utilizing incident classifications and escalation protocols, in accordance with applicable governmental regulations and other legal requirements.

We have an IRP to prepare for and respond to cybersecurity incidents. The process is tested in annual tabletop exercises to help identify strengths and areas for improvement.

Engagement of Third Party Advisors

We engage third party advisors, including assessors, cybersecurity consultants, and auditors to assess, validate, and enhance our cybersecurity program. We benefit from engaging third parties to provide specialized skills, knowledge, tools, and resources. These third parties also help reduce costs, increase efficiency, improve quality, mitigate risks, and review cybersecurity strategy, trends, and threat landscape. We refine and mature our cybersecurity roadmap and strategy based on findings and their risk standing.

Third-Party Service Provider Risk Management

We have a process in place to oversee and identify risks from cybersecurity threats associated with our use of key third-party service providers during the course of engagement. The company maintains a formal risk management program to identify, assess, monitor and mitigate risks associated with third-party relationships, including cybersecurity risks. Our vendor security assessment process evaluates key vendors and, where appropriate, assesses vendor's controls for IT security, privacy, business continuity, and other third-party risks. Following an evaluation, the company determines and prioritizes risks based on their potential impact, which help inform the appropriate level of additional due diligence and ongoing compliance monitoring.

Material Risks from Cybersecurity Threats

We have not identified risks from known cybersecurity threats, including as a result of any previous cybersecurity incidents, that have materially affected us, including our business strategy, results of operations or financial condition, but we face certain ongoing cybersecurity risks threats that, if realized, are reasonably likely to materially affect us. For additional information regarding these risks, please refer to Item 1A, "Risk Factors," "If we, or our partners or suppliers, experience a significant disruption in, or breach in security of, information technology systems, or fail to implement new systems and software successfully, our business could be adversely affected. Cyberattacks and security vulnerabilities could lead to reduced revenue, increased costs, liability claims, or harm to our reputation or competitive position" in this Annual Report on Form 10-K.

Cybersecurity Governance

Board Oversight of Risks from Cybersecurity Threats

The Board oversees management's processes for identifying and mitigating risks, including cybersecurity risks, to help align our risk exposure with our strategic objectives. Our CIO regularly briefs the Board on cybersecurity matters. We have procedures led by our CIO which govern our assessment, response and notification of internal and external parties upon the occurrence of a cybersecurity incident. Depending on the nature and severity of an incident, this process provides for escalating notification to our executive team, to evaluate the overall impact and appropriate or required external notifications. Based on its nature and severity, the Board would be informed of an incident by our executive team.

Management's Role in Assessing and Managing Materials Risks from Cybersecurity Threats

Under the IRP, cybersecurity incidents are escalated based on a defined incident severity to management as appropriate. Management, including the CIO, is involved in assessing and managing our cybersecurity risks. Our CIO has 13 years of experience managing information technology in complex environments. As noted above, the company's IRP includes standard processes for escalating significant cybersecurity incidents to management, including the CIO, who then informs the Board based on the nature and severity of the incident. The company's incident response team also coordinates with external legal advisors, cybersecurity forensic firms, communication specialists, and other outside advisors and experts, as appropriate.

Item 2. ***Properties***

Our principal facilities are described below:

Principal Facilities	Approximate Square Footage	Lease Expiration	Use	Owned or Leased
Wilsonville, OR	211,995	2044	General & Administration and Manufacturing	Leased
South San Francisco, CA	91,791	2028	General & Administration, R&D and Manufacturing	Leased
Brisbane, CA	24,786	2026	Warehouse facility	Leased
Quincy, MA	38,853	2032	General & Administration, R&D and Manufacturing	Leased
Guangzhou, China	9,956	2026	General & Administration, Sales & Marketing and Supply Chain activities	Leased
Carlsbad, CA	8,772	2026	Sales & Marketing	Leased
Singapore	1,353	2025	Sales & Marketing	Leased

The Company believes its existing facilities are in good operating condition and are suitable for the conduct of its business.

Item 3. ***Legal proceedings***

For a description of material pending legal proceedings, see Note 9 “Commitments and Contingencies - Legal Proceedings” of the Notes to Condensed Consolidated Financial Statements included in Part II, Item 8 of this Annual Report on Form 10-K, which is incorporated herein by reference. In addition, we are subject to various legal proceedings and claims arising in the ordinary course of business. Although occasional adverse decisions or settlements may occur, management believes that the final disposition of such matters will not have a material adverse effect on our business, financial position, results of operations or cash flows.

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***

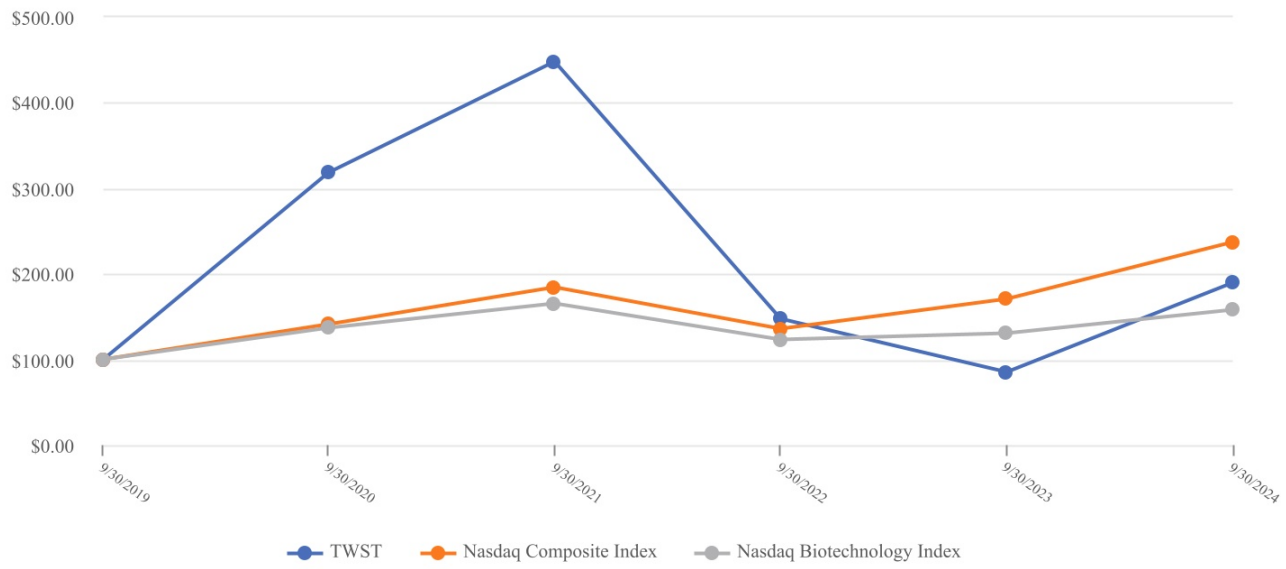
Market information for common stock

Our common stock began trading on The Nasdaq Global Market under the symbol “TWST” on October 31, 2018 in connection with the initial public offering of our common stock. Prior to that date, there was no public market for our common stock.

Performance Graph

This graph is not “soliciting material” or subject to Regulation 14A, deemed “filed” with the SEC for purposes of Section 18 of the Exchange Act, or otherwise subject to liabilities under that section, and shall not be deemed incorporated by reference into any filing of the Company under the Securities Act or the Exchange Act, whether made before or after the date hereof and irrespective of any general incorporation language in any such filing.

The following graph compares the cumulative total shareholder return on our common stock to the cumulative total returns of the Nasdaq Composite Index and the Nasdaq Biotechnology Index. An investment of $100 is assumed to have been made in our common stock and each index on September 30, 2019 and its performance is presented as of the end of each our fiscal years through September 30, 2024. Pursuant to applicable SEC rules, all values assume reinvestment of the full amount of all dividends; however, no dividends have been declared on our common stock to date. The returns shown on the graph below are based on historical results and are not necessarily indicative of future performance, and we do not make or endorse any predictions as to future returns.



* $100.00 invested on October 1, 2019 in stock or index, including reinvestment of dividends.

	9/30/2019	9/30/2020	9/30/2021	9/30/2022	9/30/2023	9/30/2024
Twist Bioscience Corporation	$ 100.00	$ 318.13	$ 447.95	$ 147.57	$ 84.84	$ 189.20
Nasdaq Composite Index	$ 100.00	$ 140.96	$ 183.61	$ 135.41	$ 170.76	$ 236.74
Nasdaq Biotechnology Index	$ 100.00	$ 136.90	$ 164.57	$ 123.00	$ 130.12	$ 158.21

Holders of Record

As of November 13, 2024, there were approximately 50 holders of record of our common stock. Because many of our shares of common stock are held by brokers and other institutions on behalf of stockholders, we are unable to estimate the total number of stockholders represented by these record holders.

Dividend Policy

We have never declared or paid, and do not anticipate declaring or paying in the foreseeable future, any cash dividends on our capital stock. Any future determination to declare cash dividends will be made at the discretion of our board of directors, subject to applicable laws, and will depend on our financial condition, results of operations, capital requirements, general business conditions and other factors that our board of directors may deem relevant.

Sales of unregistered securities

None.

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 Financial Condition and Results of Operations (MD&A) is intended to promote understanding of the results of operations and financial condition. The following discussion and analysis of our financial condition and results of operations should be read in conjunction with our consolidated financial statements and the related notes to those statements included elsewhere in this Form 10-K. In addition to historical financial information, the following discussion and analysis contains forward-looking statements that involve risks, uncertainties and assumptions. Our actual results and timing of selected events may differ materially from those anticipated in these forward-looking statements as a result of many factors, including those discussed under "Risk factors" and elsewhere in this Form 10-K. The last day of our fiscal year is September 30, and we refer to our fiscal year ended September 30, 2022 as fiscal year 2022 or 2022, September 30, 2023 as fiscal year 2023 or 2023 and our fiscal year ended September 30, 2024 as fiscal year 2024 or 2024.

Overview

We are a leading, rapidly growing synthetic biology company that has developed a disruptive DNA synthesis platform to industrialize the engineering of biology. The core of our platform is a proprietary technology that pioneers a new method of manufacturing synthetic DNA by "writing" DNA on a silicon chip. We have combined our silicon-based DNA writing technology with proprietary software, scalable commercial infrastructure and an e-commerce platform to create an integrated technology platform that enables us to achieve high levels of quality, precision, automation, and manufacturing throughput at a significantly lower cost than our competitors We have applied our unique technology to manufacture a broad range of synthetic DNA-based products, including synthetic genes, tools for next generation sequencing, or NGS, sample preparation, and antibody libraries for drug discovery and development, all designed to enable our customers to conduct research more efficiently and effectively. Leveraging our same technology, we have expanded our footprint beyond DNA synthesis to manufacture synthetic RNA as well as antibody proteins to disrupt and innovate within larger market opportunities, in addition to discovery partnerships for biologic drugs and developing completely new applications for synthetic DNA, such as digital data storage.

We believe our products enable a broad range of applications that may ultimately improve health and the sustainability of the planet across multiple industries including healthcare, chemicals/materials, food/agriculture, academic research, and technology. We sell our synthetic DNA and synthetic DNA-based products to a customer base of approximately 3,562 customers annually across a broad range of industries. In order to address this diverse customer base, we employ a multi-channel strategy comprised of a direct sales force targeting synthetic DNA customers, a direct sales force focusing on the NGS market and an e-commerce platform that serves both commercial channels We employ business development and sales representatives for our biopharma solutions as well. Our easy-to-use e-commerce platform allows customers to design, validate, and place on-demand orders of customized DNA online, and enables them to receive real-time customized quotes for their products and track their order status through the manufacturing and delivery process. This is a critical part of our strategy to address our large markets and diverse customer base, as well as drive commercial productivity, enhance the customer experience, and promote loyalty.

We currently generate revenue through our synthetic biology and NGS tools product lines as well as biopharma services for antibody discovery, optimization and development. We generated revenues of $313.0 million in the year ended September 30, 2024, $245.1 million in the year ended September 30, 2023 and $203.6 million in the year ended September 30, 2022, while incurring net losses of $208.7 million, $204.6 million and $217.9 million in the years ended September 30, 2024, 2023 and 2022, respectively. Since our inception, we have incurred significant operating losses and have accumulated a net deficit of $1,241.9 million. Our ability to generate product revenue sufficient to achieve profitability will depend heavily on the success of our existing products and the development and commercialization of additional products in the synthetic biology, biologic drug and data storage industries as well as leveraging our investment in our manufacturing facility in Wilsonville, Oregon.

Highlights from fiscal year 2024 compared with fiscal year 2023 include:

- Revenue growth of 28% to $313.0 million from $245.1 million, primarily due to order growth in NGS tools and synthetic genes;
- Gross margin increased to 42.6% from 36.6%;
- Net cash used in operating activities for the year ended September 30, 2024 decreased to $64.1 million from $142.5 million for the year ended September 30, 2023.

Financial highlights

The following table summarizes certain selected historical financial results:

(in thousands)	Year ended September 30, 2024	2023	2022
Revenues	$ 312,974	$ 245,109	$ 203,565
Gross margin	42.6 %	36.6 %	41.4 %
Loss from operations	$ (220,831)	$ (217,159)	$ (234,776)
Net loss attributable to common stockholders	$ (208,726)	$ (204,618)	$ (217,863)
Net cash used in operating activities	$ (64,094)	$ (142,474)	$ (124,385)
Net loss per share attributable to common stockholders—basic and diluted	$ (3.60)	$ (3.60)	$ (4.04)

See “Results of Operations” below for discussion of our results for the periods presented.

Key business metrics

We regularly review the following key business metrics to evaluate our business, measure our performance, identify trends affecting our business, formulate financial projections and make strategic decisions. We believe that the following metrics are representative of our current business. However, we anticipate these will change or may be substituted for additional or different metrics as our business grows.

Product shipments including synthetic genes

We believe that the number of genes shipped serves as a direct indicator of our operational efficiency and market demand. This metric is crucial for assessing our performance in meeting customer demand and generating revenues. Shipments of number of genes in years ended September 30, 2024, 2023 and 2022 were as follows:

(in thousands)	Year ended September 30, 2024	2023	2022
Number of genes shipped	772	634	558

Number of customers

We believe that the number of customers who have purchased from us since inception is representative of our ability to drive adoption of our products. We define a customer as a unique "Bill To" account where a single customer may have many "Ship To" locations and may have many unique points of contact within a single "Bill To" customer. In 2024, 2023 and 2022 the number of customers who purchased products from us were approximately 3,562, 3,450 and 3,300 customers, respectively.

Percentage of revenue from repeat customers

We believe that the percentage of revenue that we generate from both new and repeat customers is an indicator of our ability to drive adoption of our products amongst existing customers while also generating a robust pipeline of new customers. We define a repeat customer as any customer who has purchased products or services from us more than once in the current fiscal year.

	Year ended September 30, 2024	2023	2022
Number of customers	3,562	3,450	3,300
Revenue from repeat customers	99 %	98 %	98 %

Value of orders received

We believe that the value of orders we receive is a leading indicator of our ability to generate revenue in subsequent quarters, although there can be no assurance orders will translate into revenue. We define an order as a contract with a

customer or purchase order from a customer, which outlines the promised goods at an agreed upon-price. In some cases, we receive a blanket purchase order from our customers, which includes pricing, payment and other terms and conditions, with quantities defined at the time each customer subsequently issues periodic releases against the blanket purchase order. We regularly assess trends relating to the value of orders we receive, including with respect to our customer concentration.

Orders may never convert into actual revenue and the timing of delivery of our orders and recognition of revenue, if any, may vary based on the nature of the order, and there can be no assurance that orders will result in recognized revenue. The following table lists the value of orders received during the periods indicated:

	Year ended September 30,		
(in thousands)	2024	2023	2022
Order value	$ 344,200	$ 263,887	$ 226,435

Results of operations

Comparison of the years ended September 30, 2024, 2023 and 2022

Revenues

We generate revenue from sales of synthetic genes, oligo pools, NGS tools, DNA libraries and antibody discovery services. Our ability to increase our revenues will depend on our ability to further penetrate the domestic and international markets, generate sales through our direct sales force, distributors, and over time, from our e-commerce digital platform and the launch of new products.

	Year ended September 30,			Change			
(in thousands, except percentages)	2024	2023	2022	2024-2023		2023-2022	
Revenues	$ 312,974	$ 245,109	$ 203,565	$ 67,865	28%	$ 41,544	20%

Revenues by geography

We have one reportable segment from the manufacturing of synthetic DNA products. The following table shows our revenues by geography, based on our customers' shipping addresses. Americas consists of United States, Canada, Mexico and South America; EMEA consists of Europe, Middle East and Africa; and APAC consists of Japan, China, South Korea, India, Singapore, Malaysia, Australia, New Zealand, Thailand and Taiwan.

	Year ended September 30,					
(in thousands, except percentages)	2024	%	2023	%	2022	%
Americas	$ 193,884	62%	$ 151,263	62%	$ 122,473	61%
EMEA	92,567	30%	71,389	29%	62,078	30%
APAC	26,523	8%	22,457	9%	19,014	9%
Total revenues	$ 312,974	100%	$ 245,109	100%	$ 203,565	100%

Revenues by products

The table below sets forth revenues by products:

	Year ended September 30,					
(in thousands, except percentages)	2024	%	2023	%	2022	%
Synthetic genes	$ 92,679	30%	$ 73,541	30%	$ 61,509	30%
Oligo pools	16,906	5%	14,489	6%	12,424	6%
DNA libraries	13,933	4%	10,201	4%	6,149	3%
Antibody discovery	20,328	7%	23,172	9%	24,171	12%
NGS tools	169,128	54%	123,706	51%	99,312	49%
Total revenues	$ 312,974	100%	$ 245,109	100%	$ 203,565	100%

Revenues by industry

The table below sets forth revenues by industry:

	Year ended September 30,					
(in thousands, except percentages)	**2024**	**%**	**2023**	**%**	**2022**	**%**
Industrial chemicals/materials	$ 83,472	26%	$ 59,321	24%	$ 57,940	29%
Academic research	58,452	19%	45,847	19%	37,097	18%
Healthcare	168,959	54%	137,148	56%	106,363	52%
Food/agriculture	2,091	1%	2,793	1%	2,165	1%
Total revenues	$ 312,974	100%	$ 245,109	100%	$ 203,565	100%

Revenues increased 28% to $313.0 million in the year ended September 30, 2024, as compared to $245.1 million in the year ended September 30, 2023. The increase in revenue primarily reflects growth in NGS tools revenue of $45.4 million and growth in synthetic genes revenue of $19.1 million, including the Express Genes offering, which is primarily attributable to increase in revenues from our customers in the healthcare, industrial chemicals/materials and academic research industries and an increase in the number of customers. The number of our genes shipped in the year ended September 30, 2024, increased to approximately 772,000 genes, compared to approximately 634,000 genes in the year ended September 30, 2023, an increase of 22%.

Revenues increased from $203.6 million to $245.1 million in the year ended September 30, 2023, which was an increase of $41.5 million, or 20%, as compared to the same period in 2022. The increase in revenue was primarily due to the increase in revenue from NGS tools, which grew from $99.3 million in 2022 to $123.7 million in 2023, an increase in revenue from synthetic genes, which grew from $61.5 million in 2022 to $73.5 million and an increase in revenue from DNA libraries revenue, which grew from $6.1 million in 2022 to $10.2 million. The growth in NGS tools revenue is primarily attributable to an increase in revenue from our top customers and the adoption of our product by a larger customers base. Our synthetic genes revenue grew mainly from our top customers and growth in the healthcare and academic research industries as well as an improved turnaround time. In the year ended September 30, 2023, we shipped approximately 634,000 genes compared to approximately 558,000 genes in the year ended September 30, 2022, an increase of 14%. Changes in our synthetic gene pricing, while favorable, had a minimal impact on our results of operations period-over-period. Our DNA libraries revenue grew year over year as a result of increased customers, mainly in the healthcare and academic research industries.

A discussion of our revenues for the year ended September 30, 2022 as compared to the year ended September 30, 2021 can be found on page 54 of our Annual Report on Form 10-K for the fiscal year ended September 30, 2023 filed with the SEC on November 21, 2023, or our 2023 Annual Report.

Cost of revenues

Cost of revenues reflects the aggregate cost incurred in the production and delivery of our products and consists of production materials, personnel costs, cost of expensed equipment and consumables, laboratory supplies, consulting costs, depreciation, production overhead costs, information technology ("IT"), maintenance and facility costs. Personnel costs consist of salaries, employee benefit costs, bonuses, and stock-based compensation expenses. In addition, cost of revenue includes royalty costs for licensed technologies included in the Company's products and provisions for slow-moving and obsolete inventory. We expect that our cost of revenues will vary with changes in our revenues and our revenue mix.

	Year ended September 30,			Change			
(in thousands, except percentages)	**2024**	**2023**	**2022**	**2024-2023**		**2023-2022**	
Cost of revenues	$ 179,625	$ 155,380	$ 119,330	$ 24,245	16%	$ 36,050	30%
Gross profit	$ 133,349	$ 89,729	$ 84,235	$ 43,620	49%	$ 5,494	7%
Gross margin	42.6 %	36.6 %	41.4 %	6%		(5)%	

Cost of revenues increased 16% to $179.6 million in the year ended September 30, 2024, as compared to $155.4 million in the year ended September 30, 2023. The increase is primarily attributable to an increase in material costs of $19.0 million, due to higher sales volume, and an increase in depreciation and amortization expense of $3.2 million primarily due to the capital investment to increase manufacturing capacity in prior years. The remaining increase is attributable to an increase in lab supplies and facilities costs of $1.4 million. Gross margin increased 600 basis points to 42.6% for the year ended

September 30, 2024 as compared to 36.6% for the year ended September 30, 2023 mainly due to increase in revenue and the fixed costs being spread over larger revenue base resulting in an increase in gross margin.

Cost of revenues increased from $119.3 million in the prior year to $155.4 million in the year ended September 30, 2023, an increase of $36.1 million, or 30%. The material costs increase by $14.7 million due to higher volume. Payroll, including stock-based compensation, increased $9.9 million, which included $7.4 million of savings related to the 2023 restructuring plan. Depreciation and amortization increased by $11.9 million associated with the capital investment to increase capacity. The increase in payroll costs and depreciation expenses was primarily due to the build out of the second manufacturing facility located in Wilsonville, Oregon.

A discussion of our cost of revenues for the year ended September 30, 2022 as compared to the year ended September 30, 2021 can be found on page 54 of our 2023 Annual Report.

Research and development expenses

Research and development expenses consist primarily of costs incurred for the development of our products, which include personnel costs, laboratory equipment and supplies, consulting costs, depreciation, rent, IT, maintenance and facility costs. Personnel costs consist of salaries, employee benefit costs, bonuses, and stock-based compensation expenses. We expense our research and development expenses in the period in which they are incurred.

	Year ended September 30,			Change			
(in thousands, except percentages)	2024	2023	2022	2024-2023		2023-2022	
Research and development	$ 90,852	$ 106,894	$ 120,307	$ (16,042)	(15)%	$ (13,413)	(11)%

Research and development expenses decreased 15% to $90.9 million for the year ended September 30, 2024, as compared to the $106.9 million for the year ended September 30, 2023. The decrease is primarily due to a decrease in personnel costs of $9.3 million, including stock-based compensation expense of $2.7 million due to the reduction of headcount related to the 2023 restructuring plan. The remaining decrease is attributable to decreases in outside services costs of $2.2 million, depreciation expenses of $1.0 million and lab supplies costs of $6.1 million. These decreases are partially offset by a lack of grant reimbursement in 2024 where we received $2.7 million in 2023, which are netted against the research and development expenses.

Research and development expenses decreased by $13.4 million to $106.9 million for the year ended September 30, 2023, as compared to the same period 2022. The decrease is primarily due to the deconsolidation of Revelar in fiscal year 2022, which contributed to a decrease of $14.1 million. Excluding the impact of Revelar, research and development expenses increased $0.7 million. The increase is primarily due to increases in lab supplies of $1.5 million, outside services of $0.7 million, and depreciation of $0.6 million. Additionally, grant reimbursements, which are netted against our research and development expenses, were $1.6 million lower during the year ended September 30, 2023 than the prior year. The increase was partially offset by a $4.0 million decrease in payroll, which consists of a $1.6 million increase in payroll, offset by a decrease of $5.6 million in stock-based compensation.

A discussion of our research and development expenses for the year ended September 30, 2022 as compared to the year ended September 30, 2021 can be found on page 55 of our 2023 Annual Report.

Selling, general and administrative expenses

Selling expenses consist of personnel costs, customer service expenses, direct marketing expenses, educational and promotional expense, market research and analysis. General and administrative expenses are incurred for executive, finance and accounting, legal and human resources functions and consist of personnel costs, audit and legal expenses, consulting costs, depreciation, insurance costs, travel expenses, rent, IT, maintenance and facility costs. Personnel costs consist of salaries, employee benefit costs, bonuses, commissions and stock-based compensation expenses. We expense all selling, general and administrative expenses as incurred. We expect our selling costs will continue to increase in absolute dollars, primarily driven by our efforts to expand our commercial capability, with an increased presence both within and outside the United States, and to expand our brand awareness and customer base through targeted marketing initiatives.

	Year ended September 30,			Change			
(in thousands, except percentages)	2024	2023	2022	2024-2023		2023-2022	
Selling, general and administrative	$ 218,398	$ 189,738	$ 212,949	$ 28,660	15%	$ (23,211)	(11)%

Total selling, general and administrative expenses increased 15% to $218.4 million for the year ended September 30, 2024, as compared to $189.7 million for the year ended September 30, 2023. The increase is primarily due to an increase in personnel costs of $37.7 million, including an increase in stock-based compensation expense of $24.2 million. The increase in stock-based compensation expense is primarily due to a reversal of $15.9 million in the first quarter 2023 because of employee stock forfeitures related to an acquisition performance condition not being met and the remaining increase is due to stock-based awards granted to existing and new employees during fiscal year 2024. Further, the increase is attributable to increases in outside service costs of $1.1 million, facilities costs of $2.3 million, marketing costs of $3.4 million, IT services costs of $2.9 million and depreciation and amortization expense of $0.9 million. These increases are partially offset by the decrease in the Wilsonville manufacturing facility pre-commercialization costs of $19.3 million, which was completed when the Wilsonville manufacturing facility began shipping product in January 2023.

For the year ended September 30, 2023, selling, general and administrative expenses decreased by $23.2 million to $189.7 million, compared to the same period for 2022. The decrease is primarily attributable to a decrease in stock-based compensation of $43.0 million due to employee stock forfeitures related to an acquisition performance condition not being met and changes to the probability of achieving future performance conditions. The decrease was partially offset by increases in pre-commercialization Factory of the Future costs of $4.4 million, facility costs of $6.5 million, payroll costs of $5.3 million and IT-related services costs of $5.1 million.

A discussion of our selling, general and administrative expenses for the year ended September 30, 2022 as compared to the year ended September 30, 2021 can be found on page 55 of our 2023 Annual Report.

Restructuring and other costs

	Year ended September 30,			Change			
(in thousands, except percentages)	2024	2023	2022	2024-2023		2023-2022	
Restructuring and other costs	$ —	$ 9,384	$ —	$ (9,384)	(100)%	$ 9,384	—%

We recognized restructuring and other costs of $9.4 million resulting from the 2023 restructuring plan during the year ended September 30, 2023. Refer to Note 16 to the consolidated financial statements for further details.

Change in fair value of contingent considerations and holdbacks

	Year ended September 30,			Change			
(in thousands, except percentages)	2024	2023	2022	2024-2023		2023-2022	
Change in fair value of contingent considerations and holdbacks	$ —	$ (5,913)	$ (14,245)	$ 5,913	(100)%	$ 8,332	(58)%

There was no change in fair value of contingent consideration and holdbacks for the year ended September 30, 2024, as the contingent consideration and holdbacks liabilities were settled in the prior year. During the year ended September 30, 2023, we recognized a change in the fair value of contingent consideration and holdbacks of $5.5 million and $0.4 million related to the acquisitions of Abveris and iGenomX, respectively. The changes were the result of not achieving the Abveris revenue target for calendar year 2022 and a change in fair value of our stock price.

A discussion of our change in fair value of contingent considerations and holdbacks for the year ended September 30, 2022 as compared to the year ended September 30, 2021, can be found on page 56 of our 2023 Annual Report.

Impairment of long-lived assets

	Year ended September 30,			Change			
(in thousands, except percentages)	2024	2023	2022	2024-2023		2023-2022	
Impairment of long-lived assets	$ 44,930	$ 6,785	$ —	$ 38,145	562 %	$ 6,785	100 %

We recognized impairment of intangible assets and property and equipment of $44.9 million related to the Biopharma asset group during the year ended September 30, 2024 (see discussion in critical accounting policies and estimates — impairment of long-lived assets below), as compared to impairment of property and equipment of $6.8 million during the year ended September 30, 2023, related to write-off of lab equipment and leasehold improvements for decommissioned labs and computer software.

Interest and other income (expense), net

Other income (expense), net consists of realized foreign exchange gains and losses, loss on disposal of property and equipment and impairment of equity investments.

(in thousands, except percentages)	Year ended September 30, 2024	2023	2022	Change 2024-2023		2023-2022	
Interest income	$ 15,344	$ 14,365	$ 3,062	$ 979	7 %	$ 11,303	369 %
Interest expense	(29)	(5)	(80)	(24)	480 %	75	(94)%
Other income (expense)	(2,650)	(667)	(1,087)	(1,983)	297%	420	(39)%
Total interest, and other income (expense), net	$ 12,665	$ 13,693	$ 1,895	$ (1,028)	784 %	$ 11,798	237 %

Interest income increased 7%, to $15.3 million in the year ended September 30, 2024, as compared to $14.4 million for the year ended September 30, 2023, resulting from our cash and cash equivalents and short-term investments balance. Other income (expense) was $2.7 million in fiscal year 2024, as compared to $0.7 million in fiscal year 2023, mainly due to fiscal year 2024 impairment losses on an equity investment.

A discussion of our interest and other income (expense), net for the year ended September 30, 2022 as compared to the year ended September 30, 2021, can be found on page 56 of our 2023 Annual Report.

Gain on deconsolidation of a subsidiary

(in thousands, except percentages)	Year ended September 30, 2024	2023	2022	Change 2024-2023		2023-2022	
Gain on deconsolidation of a subsidiary	$ —	$ —	$ 4,607	$ —	— %	$ (4,607)	(100)%

Gain on deconsolidation of a subsidiary represents the gain associated with the deconsolidation of a variable interest entity, Revelar, on September 30, 2022.

Income tax expense

(in thousands, except percentages)	Year ended September 30, 2024	2023	2022	Change 2024-2023		2023-2022	
Income tax expense	$ (560)	$ (1,152)	$ 10,411	$ 592	(51)%	$ (11,563)	(111)%

We recorded income tax provision of $0.6 million and $1.2 million for the year ended September 30, 2024 and 2023, respectively. We recorded income tax benefit of $10.4 million in 2022 mainly as a result of the business acquisition of Abveris.

Liquidity and capital resources

Sources of liquidity

To date, we have financed our operations principally through public equity raises, private placements of our convertible preferred stock, borrowings from credit facilities and revenue from our commercial operations. As of September 30, 2024, we had a balance of $226.3 million of cash and cash equivalents and $50.1 million in short-term investments.

Capital resources

Our primary cash needs are for operating expenses, working capital and capital expenditures to support the growth in our business. As of September 30, 2024, we had cash, cash equivalents and short-term investments of $276.4 million.

We believe that our existing cash, cash equivalents and short-term investments are sufficient to fund our operating expenses, capital expenditure requirements and debt service payments for the next 12 months. In the future, we may still need to obtain additional financing to fund operations beyond this period, and there can be no assurance that we will be successful in raising additional financing on terms which are acceptable to us. In addition, our operating plans may change as a result of factors currently unknown to us, and we may need to seek additional funds sooner than planned. Such financing may result in dilution to stockholders, imposition of debt covenants and repayment obligations, or other restrictions that may adversely affect our business. In addition, we may seek additional capital due to favorable market conditions or strategic considerations even if we believe we have sufficient funds for our current or future operating plans. Our future capital requirements will depend on many factors. See “Risk factors—We will require additional financing to achieve our goals, and a failure to obtain this necessary capital when needed on acceptable terms, or at all, could force us to delay, limit, reduce or terminate our product manufacturing and development and other operations.”

Inflation Risk

While we have experienced increased operating costs in recent periods, which we believe are due in part to the recent growth in inflation, we do not believe that inflation has had a material effect on our business, financial condition or results of operations. If our costs were to become subject to significant inflationary pressures, we may not be able to fully offset such higher costs through price increases. Our inability or failure to do so could adversely affect our business, financial condition and results of operations.

Operating capital requirements

Our primary uses of capital are, and we expect will continue to be for the near future, compensation and related expenses, manufacturing costs, laboratory and related supplies, legal and other regulatory expenses, and general overhead costs and the capital expenditures. We had $1.6 million in commitments for capital expenditures as of September 30, 2024.

Cash flows

The following table summarizes our sources and uses of cash and cash equivalents:

	Year ended September 30,		
(in thousands)	2024	2023	2022
Net cash used in operating activities	$ (64,094)	$ (142,474)	$ (124,385)
Net cash provided by (used in) investing activities	(3,071)	50,612	(232,930)
Net cash provided by financing activities	6,890	911	270,534

Operating activities

Net cash used in operating activities was $64.1 million in fiscal year 2024 and consisted primarily of a net loss of $208.7 million adjusted for non-cash items including depreciation and amortization expenses of $31.4 million, stock-based compensation expense of $50.9 million, impairment of long-lived assets of $44.9 million, non-cash lease expense of $0.9 million, and a change in operating assets and liabilities of $15.4 million. The change in operating assets and liabilities was mainly due to decreases in accounts receivable of $8.4 million, inventory of $8.0 million, prepaid and other current assets of $0.4 million, other non-current assets of $0.4 million, accounts payable of $11.8 million and other liabilities $2.3 million, offset by increases in accrued expenses of $4.4 million and accrued compensation of $7.9 million.

Net cash used in operating activities was $142.5 million in fiscal year 2023 and consisted primarily of a net loss of $204.6 million adjusted for non-cash items including depreciation and amortization expenses of $29.3 million, stock-based compensation expense of $30.3 million, impairment of property and equipment and other assets of $6.8 million, non-cash lease expense of $2.6 million, change in fair value of contingent consideration and holdbacks of $5.9 million and a change in operating assets and liabilities of $1.0 million. The change in operating assets and liabilities was mainly due to increases in accounts receivable of $4.3 million, prepaid and other current assets of $4.2 million and accrued expenses of $2.6 million, offset by decreases in inventory of $7.2 million, other non-current assets of $1.4 million, accounts payable of $2.5 million, accrued compensation of $1.1 million and other liabilities $0.1 million.

A discussion of net cash used in operating activities for the fiscal year 2022 can be found on page 58 of our 2023 Annual Report.

Investing activities

In fiscal year 2024, our net cash used in the investing activities was $3.1 million primarily as a result of the net result of purchases and maturity of investments of $2.0 million and purchases of laboratory property, equipment and computers of $5.1 million.

In fiscal year 2023, our net cash used in the investing activities was $50.6 million primarily as a result of the net result of purchases and maturity of investments of $78.4 million and purchases of laboratory property, equipment and computers of $27.8 million.

A discussion of net cash used in investing activities for the fiscal year 2022 can be found on page 59 of our 2023 Annual Report.

Financing activities

Net cash provided by financing activities was $6.9 million in fiscal year 2024, which consisted of $3.8 million from proceeds from issuance of shares under the 2018 ESPP and $7.1 million from the exercise of stock options, offset by $4.0 million in repurchases of common stock for income tax withholdings.

Net cash provided by financing activities was $0.9 million in fiscal year 2023, which consisted of $3.9 million from proceeds from issuance of shares under the 2018 ESPP and $1.4 million from the exercise of stock options, offset by $4.4 million in repurchases of common stock for income tax withholdings.

A discussion of net cash provided by financing activities for the fiscal year 2022 can be found on page 59 of our 2023 Annual Report.

Off-balance sheet arrangements

We do not have any off-balance sheet arrangements other than our indemnification agreements as described in Note 9 of the consolidated financial statements included elsewhere in this Form 10-K.

Contractual obligations and other commitments

As of September 30, 2024, our operating lease obligation was $85.0 million related to various operating lease arrangements for facilities. See Note 8, Leases, of the Notes to the Consolidated Financial Statements for further discussion relating to these lease obligations.

Critical accounting policies and estimates

The discussion and analysis of our financial condition and results of operations are based upon our audited consolidated financial statements, which have been prepared in accordance with accounting principles generally accepted in the United States. The preparation of these financial statements requires management to make estimates and judgments that affect the reported amounts of assets, liabilities, revenues and expenses, and related disclosures of contingent assets and liabilities. On an ongoing basis, management evaluates the reasonableness of its estimates. Management bases its estimates on historical experience and on various assumptions that are believed to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily available from other sources. Actual results may differ materially from these estimates under different assumptions or conditions.

We believe the following critical accounting policies require that we make significant judgments and estimates in preparing our consolidated financial statements.

Revenue recognition

Our revenue is generated through the sale of synthetic biology tools, such as synthetic genes, or clonal genes and fragments, oligonucleotide pools, or oligo pools, NGS tools, DNA libraries, and biopharma services for antibody discovery, optimization and development ("Biopharma").

Contracts with customers are in the written form of a purchase order or a quotation, which outline the promised goods and the agreed upon price. Such orders may be accompanied by a Master Supply or Distribution Agreement that establishes the terms and conditions, rights of the parties, delivery terms, and pricing. We assess collectability based on a number of factors, including past transaction history and creditworthiness of the customer.

We recognize revenue for synthetic biology tools, NGS tools, and DNA libraries when control of the products is transferred to the customer and at a transaction price that is determined based on the agreed upon rates in the applicable order or master supply agreement applied to the quantity of synthetic DNA that was manufactured and shipped to the customer. The transaction price is determined based on the agreed upon rates in the purchase order or master supply agreements applied to the quantity of all the products that were manufactured and shipped to the customer. Our contracts may include one or more ordered products, and the shipment of these products comprises the performance obligation(s) under the contract. Accordingly, all of the transaction price, net of any discounts, is allocated to the performance obligation (s). Our sales are primarily subject to Ex Works (as defined in Incoterms 2010) delivery terms and revenue, other than Biopharma revenue, is recorded at the point in time when products are picked up by the customer's freight forwarder, as we have determined that this is the point in time that product control transfers to the customer. Therefore, upon shipment of the product, there are no remaining performance obligations. Our shipping and handling activities are performed before the customer obtains control of the goods and therefore are considered a fulfillment cost. Shipping and handling fees charged to our customers are recognized as product revenue in the period shipped and the related costs for providing these services are recorded as a cost of revenue. We have elected to exclude all sales and value added taxes from the measurement of the transaction price. We have not adjusted the transaction price for significant financing since the time period between the transfer of goods and payment is less than one year. We have elected the practical expedient of not disclosing the consideration allocated to remaining performance obligations and an explanation of when those amounts are expected to be recognized as revenue since the duration of our contracts is less than one year.

Our Biopharma revenue primarily consists of research and development agreements with third parties that provide for up-front and milestone-based payments. We also enter into research and development agreements that do not include up-front or milestone-based payments and recognize revenue on these types of agreements based on the timing of development activities. Our research and development agreements may include more than one performance obligation. At the inception of the agreement, we assess whether each obligation represents a separate performance obligation or whether such obligations should be combined as a single performance obligation. The transaction price for each agreement is determined based on the amount of consideration we expect to be entitled to for satisfying all performance obligations within the agreement. We assess the nature of the combined performance obligation to determine whether the combined performance obligation is satisfied over time or at a point in time and, if over time, the appropriate method of measuring progress for purposes of recognizing revenue. In agreements where we satisfy performance obligation(s) over time, we recognize development revenue typically using an input method based on our costs incurred relative to the total expected cost which determines the extent of our progress toward completion. As part of the accounting for these arrangements, we must develop estimates and assumptions that require judgment to determine the transaction price and progress towards completion. We review our estimate of the transaction price and progress toward completion based on the best information available to recognize the cumulative progress toward completion as of the end of each reporting period and make revisions to such estimates as necessary. Also, these research and development agreements may include license payments. We recognize revenue from functional license agreements when the license is transferred to the customer and the customer is able to use and benefit from the license. A functional license has significant standalone functionality because it can be used "as is" for performing a specific task.

We had contract assets of $2.0 million and contract liabilities of $2.1 million as of September 30, 2024. We had contract assets of $2.8 million and contract liabilities of $3.0 million as of September 30, 2023. For the years ended September 30, 2024, 2023 and 2022 the Company recognized revenue of $1.7 million, $2.8 million and $1.1 million, respectively, from the amount that was included in the contract liability balance at the beginning of each year. In addition, for all periods presented, there was no revenue recognized in a reporting period from performance obligations satisfied in previous periods. The aggregate amount of the transaction price allocated to the performance obligations that are unsatisfied as of September 30, 2024 was $8.6 million. We expect to recognize revenue over the next twelve months relating to performance obligations unsatisfied as of September 30, 2024.

Based on the nature of our contracts with customers which are recognized over a term of less than 12 months, we have elected to use the practical expedient whereby costs to obtain a contract are expensed as they are incurred.

We state our revenues net of any taxes collected from customers that are required to be remitted to various government agencies. The amount of taxes collected from customers and payable to governmental entities is included on the balance sheet as part of "Accrued expenses and other current liabilities."

Stock-based compensation

We have granted stock-based awards, consisting of restricted stock and stock options, to our employees, certain non-employee consultants and certain members of our board of directors. We measure stock-based compensation expense for restricted stock and stock options granted to our employees and directors on the date of grant and recognize the corresponding compensation expense of those awards over the requisite service period, which is generally the vesting period of the respective award. We measure stock-based compensation expense for restricted stock and stock options granted to non-employee consultants on the date of grant and recognize the corresponding compensation expense of those awards over the period in which the related services are received. We adjust for actual forfeitures as they occur.

We have granted performance-based stock units (PSUs) and performance stock options (PSOs) to executive officers and senior level employees. We value PSUs using a grant date fair value equal to the closing share price of our common stock on the date of grant and the probability of the achievement of the performance condition.

We did not grant any options during the years ended September 30, 2024 and 2023.

Goodwill

Determining when to test for impairment, the reporting unit, the assets and liabilities of the reporting unit, and the fair value of the reporting unit requires significant judgment and involves the use of significant estimates and assumptions. We test goodwill for impairment in our fourth quarter each year, or more frequently if indicators of an impairment exist. Evaluating goodwill for impairment involves the determination of the fair value of our reporting unit in which goodwill is recorded using a qualitative or quantitative analysis. If the fair value of the reporting unit exceeds its carrying value, goodwill is considered not impaired. If the carrying value of the reporting unit exceeds its fair value, we would record an impairment loss up to the difference between the carrying value and implied fair value.

We have an unconditional option to bypass the qualitative assessment in any period and proceed directly to performing the first step of the goodwill impairment test. For 2024, we elected to proceed directly to the step-one assessment which indicated that the fair value of our reporting unit substantially exceeded the carrying value.

Restructuring costs

We recognize restructuring charges related to restructuring plans that have been committed to by management when liabilities have been incurred. In connection with these activities, we record restructuring charges at fair value for (a) contractual employee termination benefits when obligations are associated to services already rendered, rights to such benefits have vested, and payment of benefits is probable and can be reasonably estimated, (b) one-time employee termination benefits when management has committed to a plan of termination, the plan identifies the employees and their expected termination dates, the details of termination benefits are complete, it is unlikely changes to the plan will be made or the plan will be withdrawn and communication to such employees has occurred, and (c) contract termination costs when a contract is terminated before the end of its term.

One-time employee termination benefits are recognized in their entirety when communication has occurred and future services are not required. If future services are required, the costs are recorded ratably over the remaining period of service. Contract termination costs to be incurred over the remaining contract term without economic benefit are recorded in their entirety when the contract is canceled.

Valuation of long-lived assets

We recorded impairment charges totaling $44.9 million related to property and equipment and finite-lived intangible assets which are included in "Impairment of long-lived assets" on our condensed consolidated statements of operations and comprehensive loss for the year ended September 30, 2024.

During the year ended September 30, 2024, we identified an impairment indicator with respect to an asset group associated with our antibody discovery services product line ("Biopharma asset group") due to lower than forecasted revenues. Therefore, we performed a recoverability test of long-lived assets by comparing the net book value of the Biopharma asset group, to the future undiscounted net cash flows attributable to such assets. We concluded that the carrying value of the

asset group was not recoverable as it exceeded the future undiscounted cash flows the assets are expected to generate from the use and eventual disposition of the asset group.

To measure the impairment loss, we estimated the fair value of the Biopharma asset group by applying a discounted cash flow method. Calculating the fair value of an asset group involves making certain estimates and assumptions. These estimates and assumptions include, among others, the level and timing of revenues, operating expenses, working capital and discount rates, we believe to be consistent with the inherent risks associated with the Biopharma asset group, which was approximately 14%. Changes in these factors and assumptions used can materially affect the amount of impairment loss recognized in the period the asset group was considered impaired.

The implied allocated impairment loss to any individual asset within the long-lived asset group shall not reduce the carrying amount of that asset below its fair value. We estimated the fair value of the developed technology intangible asset and the customer relationships intangible assets using an excess earnings model (income approach). We estimated the fair value of the trade name intangible asset using a relief from royalty approach. Key assumptions include the level and timing of expected future revenue, conditions and demands specific to each intangible asset over its remaining useful life. The fair value of these intangible assets is primarily affected by the projected revenues, gross margins, operating expenses, and the anticipated timing of the projected income associated with each intangible asset coupled with the discount rates used to derive their estimated present values.

After consideration of the impairment charge recorded in the current quarter, the remaining carrying amount of long-lived assets within the Biopharma asset group is approximately $11.6 million, which primarily comprises of operating lease right-of-use assets.

Recently issued accounting pronouncements

For a description of accounting changes and recent accounting pronouncements, including the expected dates of adoption and estimated effects, if any, on our consolidated financial statements, see Note 2, “Summary of Significant Accounting Policies” in the Notes to Consolidated Financial Statements in Item 8 of this Annual Report on Form 10-K.

Item 7A. *Quantitative and qualitative disclosures about market risk*

Interest rate sensitivity

We are exposed to market risk related to changes in interest rates. We had cash, cash equivalents and marketable securities of $276.4 million as of September 30, 2024, which consisted primarily of money market funds and marketable securities, largely composed of investment grade, short term fixed income securities.

The primary objective of our investment activities is to preserve capital to fund our operations. We also seek to maximize income from our investments without assuming significant risk. To achieve our objectives, we maintain a portfolio of investments in a variety of securities of high credit quality and short-term duration, according to our board-approved investment policy. Our investments are subject to interest rate risk and could fall in value if market interest rates increase. However, because of the short-term nature of the instruments in our portfolio, a sudden change in market interest rates would not be expected to have a material impact on our financial condition or results of operations. For example, a hypothetical 10% relative change in interest rates during any of the periods presented would not have a material impact on future interest income, fair values of portfolio of investments and related cash flows.

Foreign currency sensitivity

The majority of our transactions occur in U.S. dollars. However, we do have certain transactions that are denominated in currencies other than the U.S. dollar, primarily the Euro, Chinese Yuan, and British Pound, and we therefore are subject to foreign exchange risk. The fluctuation in the value of the U.S. dollar against other currencies affects the reported amounts of expenses, assets and liabilities primarily associated with a limited number of manufacturing activities.

We currently do not use derivative financial instruments for speculative trading purposes, nor do we hedge foreign currency exchange rate exposure in a manner that entirely offsets the effects of changes in foreign currency exchange rates. The counterparties to these forward foreign currency exchange contracts are creditworthy multinational commercial banks, which minimizes the risk of counterparty nonperformance. We regularly review our exposure and may, as part of this review, make changes to it.

Item 8. ***Consolidated financial statements and supplementary data***

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Report of Independent Registered Public Accounting Firm

To the Stockholders and the Board of Directors of Twist Bioscience Corporation

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Twist Bioscience Corporation (the Company) as of September 30, 2024 and 2023, the related consolidated statements of operations and comprehensive loss, stockholders' equity and cash flows for each of the three years in the period ended September 30, 2024, 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 September 30, 2024 and 2023, and the results of its operations and its cash flows for each of the three years in the period ended September 30, 2024, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of September 30, 2024, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework), and our report dated November 18, 2024 expressed an unqualified opinion thereon.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company’s financial statements based on our audits. We are a public accounting firm registered with the 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 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 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 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 financial statements. We believe that our audits provide 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 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 financial statements and (2) involved our especially challenging, subjective or complex judgments. The communication of the 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.

	Revenue recognition
Description of the Matter	As described in Note 3 to the consolidated financial statements, the Company's revenue for certain products is generated through the sale of synthetic biology tools, such as synthetic genes, oligo pools, DNA libraries and next generation sequencing tools. Management recognizes revenue for these products when control of the product is transferred to the customer and at a transaction price that is determined based on the agreed upon rates in the applicable order. The Company's revenue for products generated from synthetic genes, oligo pools, DNA libraries and next generation sequencing tools was $293 million for the year ended September 30, 2024. The accuracy and occurrence of revenues is dependent on customer orders being accurately recorded, shipped, and invoiced, and involves several applications and data sources needed for the initiation, processing, and recording of transactions. Auditing the Company's accounting for this revenue from contracts with customers was challenging and complex primarily due to the high volume of transactions, as well as the multiple applications and data sources associated with the revenue recognition process.
How We Addressed the Matter in Our Audit	To test the Company's accounting for revenue from contracts with customers for these products, we performed substantive audit procedures that included, among others, performing testing of sales transactions on a sample basis and tracing such transactions to supporting documentation, performing data analytics to test recorded revenue amounts, testing a sample of cash collections, and testing credit memo activity.

/s/ Ernst & Young LLP

We have served as the Company's auditor since 2022.
San Mateo, California
November 18, 2024

Twist Bioscience Corporation
Consolidated Balance Sheets

(In thousands except per share data)	September 30, 2024	September 30, 2023
Assets		
Current assets:		
Cash and cash equivalents	$ 226,316	$ 286,470
Short-term investments	50,083	49,943
Accounts receivable, net	34,903	44,064
Inventories	24,078	32,063
Prepaid expenses and other current assets	11,396	11,716
Total current assets	$ 346,776	$ 424,256
Property and equipment, net	102,520	131,830
Operating lease right-of-use assets	58,829	71,531
Goodwill	85,811	85,811
Intangible assets, net	14,478	54,483
Restricted cash, non-current	2,816	2,811
Other non-current assets	3,093	5,681
Total assets	$ 614,323	$ 776,403
Liabilities and stockholders' equity		
Current liabilities:		
Accounts payable	$ 1,630	$ 14,052
Accrued expenses	15,104	10,754
Accrued compensation	33,650	25,818
Current portion of operating lease liability	14,805	14,896
Other current liabilities	5,817	7,803
Total current liabilities	$ 71,006	$ 73,323
Operating lease liability, net of current portion	70,221	79,173
Other non-current liabilities	407	475
Total liabilities	$ 141,634	$ 152,971
Commitments and contingencies (Note 9)		
Stockholders' equity		
Common stock, $0.00001 par value — 100,000 and 100,000 shares authorized at September 30, 2024 and 2023, respectively; 58,877 and 57,557 shares issued and outstanding at September 30, 2024 and 2023, respectively	$ —	$ —
Additional paid-in capital	1,715,119	1,657,222
Accumulated other comprehensive loss	(522)	(756)
Accumulated deficit	(1,241,908)	(1,033,034)
Total stockholders' equity	$ 472,689	$ 623,432
Total liabilities and stockholders' equity	$ 614,323	$ 776,403

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

Twist Bioscience Corporation
Consolidated Statements of Operations and Comprehensive Loss

(In thousands, except per share data)	Year ended September 30, 2024	2023	2022
Revenues [1]	$ 312,974	$ 245,109	$ 203,565
Operating expenses:			
Cost of revenues	$ 179,625	$ 155,380	$ 119,330
Research and development	90,852	106,894	120,307
Selling, general and administrative	218,398	189,738	212,949
Restructuring and other costs	—	9,384	—
Change in fair value of contingent considerations and holdbacks	—	(5,913)	(14,245)
Impairment of long-lived assets	44,930	6,785	—
Total operating expenses	$ 533,805	$ 462,268	$ 438,341
Loss from operations	$ (220,831)	$ (217,159)	$ (234,776)
Interest income	15,344	14,365	3,062
Interest expense	(29)	(5)	(80)
Gain on deconsolidation of subsidiary	—	—	4,607
Other income (expense), net	(2,650)	(667)	(1,087)
Loss before income taxes	$ (208,166)	$ (203,466)	$ (228,274)
Income tax (expense) benefit	(560)	(1,152)	10,411
Net loss attributable to common stockholders	$ (208,726)	$ (204,618)	$ (217,863)
Other comprehensive income (loss):			
Change in unrealized gain (loss) on investments	$ 203	$ 1,510	$ (1,594)
Foreign currency translation adjustment	31	(423)	(795)
Comprehensive loss	$ (208,492)	$ (203,531)	$ (220,252)
Net loss per share attributable to common stockholders—basic and diluted	$ (3.60)	$ (3.60)	$ (4.04)
Weighted average shares used in computing net loss per share attributable to common stockholders—basic and diluted	58,016	56,885	53,885

[1] During the years ended September 30, 2024, 2023 and 2022, the Company had revenues from related parties in the amount of $12.1 million, $5.9 million and $3.5 million, respectively.

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

Twist Bioscience Corporation
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				
Balances as of September 30, 2021	49,499	$ —	$ 1,190,828	$ 546	$ (610,553)	$ 580,821
Issuance of common stock in public offerings, net of underwriting discounts, commissions and offering expenses of $17,678	5,227	—	269,822	—	—	269,822
Vesting of restricted stock units	365	—	—	—	—	—
Issuance of shares under the employee stock purchase plan	97	—	4,010	—	—	4,010
Exercise of stock options	486	—	5,952	—	—	5,952
Repurchase of early exercised stock options	—	—	—	—	—	—
Business acquisition	988	—	77,122	—	—	77,122
Stock-based compensation	—	—	79,664	—	—	79,664
Net exercise of stock warrants	—	—	—	—	—	—
Other comprehensive income	—	—	—	(2,389)	—	(2,389)
Repurchase of common stock for income tax withholdings	(139)	—	(7,754)	—	—	(7,754)
Net loss	—	—	—	—	(217,863)	(217,863)
Balances as of September 30, 2022	56,523	—	1,619,644	(1,843)	(828,416)	789,385
Vesting of restricted stock units	648	—	—	—	—	—
Issuance of shares under the employee stock purchase plan	217	—	3,937	—	—	3,937
Exercise of stock options	118	—	1,379	—	—	1,379
Business acquisition	277	—	5,860	—	—	5,860
Stock-based compensation	—	—	30,821	—	—	30,821
Other comprehensive loss	—	—	—	1,087	—	1,087
Repurchase of common stock for income tax withholdings	(226)	—	(4,419)	—	—	(4,419)
Net loss	—	—	—	—	(204,618)	(204,618)
Balances as of September 30, 2023	57,557	—	1,657,222	(756)	(1,033,034)	623,432
Impact of ASU 2016-13 adoption (Note 2)	—	—	—	—	(148)	(148)
Vesting of restricted stock units	896	—	—	—	—	—
Issuance of shares under the employee stock purchase plan	177	—	3,765	—	—	3,765
Exercise of stock options	384	—	7,100	—	—	7,100
Stock-based compensation	—	—	51,007	—	—	51,007
Other comprehensive loss	—	—	—	234	—	234
Repurchase of common stock for income tax withholdings	(137)	—	(3,975)	—	—	(3,975)
Net loss	—	—	—	—	(208,726)	(208,726)
Balances as of September 30, 2024	58,877	$ —	$ 1,715,119	$ (522)	$ (1,241,908)	$ 472,689

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

Twist Bioscience Corporation
Consolidated Statements of Cash Flows

(in thousands)	Year ended September 30, 2024	2023	2022
Cash flows from operating activities			
Net loss	$ (208,726)	$ (204,618)	$ (217,863)
Adjustments to reconcile net loss to net cash used in operating activities			
Depreciation and amortization	31,432	29,310	16,514
Impairment of long-lived assets	44,930	6,785	—
Non-cash lease expense, net of tenant improvement allowance	940	2,573	20,127
Stock-based compensation	50,925	30,278	79,664
Change in fair value of contingent considerations and holdbacks	—	(5,913)	(14,245)
Gain on deconsolidation of Revelar	—	—	(4,607)
Other non-cash adjustments	994	120	1,381
Changes in assets and liabilities:			
Accounts receivable, net	8,444	(4,320)	(9,622)
Inventories	7,986	7,238	(7,536)
Prepaid expenses and other current assets	382	(4,166)	(2,551)
Other non-current assets	431	1,376	7,273
Accounts payable	(11,805)	(2,508)	7,383
Accrued expenses	4,415	2,578	2,269
Accrued compensation	7,875	(1,099)	4,852
Other liabilities	(2,317)	(108)	(7,424)
Net cash used in operating activities	$ (64,094)	$ (142,474)	$ (124,385)
Cash flows from investing activities			
Purchases of property and equipment	$ (5,076)	$ (27,779)	$ (101,857)
Business acquisition, net of cash acquired	—	—	(8,160)
Deconsolidation of cash and cash equivalent relating to Revelar	—	—	(5,755)
Purchases of investments	(51,905)	(76,345)	(217,639)
Proceeds from maturity of investments	53,910	154,736	100,481
Net cash provided by (used in) investing activities	(3,071)	50,612	(232,930)
Cash flows from financing activities			
Proceeds from exercise of stock options	$ 7,100	$ 1,379	$ 6,014
Proceeds from public offerings, net of underwriting discounts, commissions and offering expenses	—	—	269,822
Proceeds from issuance under employee stock purchase plan	3,765	3,937	4,010
Repayments of long-term debt	—	—	(1,558)
Repurchases of common stock for income tax withholding	(3,975)	(4,405)	(7,754)
Net cash provided by financing activities	$ 6,890	$ 911	$ 270,534
Effect of exchange rates on cash, cash equivalents and restricted cash	$ 126	$ (27)	$ (319)
Net increase (decrease) in cash, cash equivalents and restricted cash	(60,149)	(90,978)	(87,100)
Cash, cash equivalents, and restricted cash at beginning of year	289,281	380,259	467,359
Cash, cash equivalents, and restricted cash at end of year	$ 229,132	$ 289,281	$ 380,259
Supplemental disclosure of cash flow information			
Interest paid	$ —	$ —	$ 9
Income taxes paid, net of refunds	344	420	246
Non-cash investing and financing activities			
Property and equipment additions included in accrued expenses and accounts payable	$ 92	$ 772	$ 6,297
Operating lease right-of-use assets obtained in exchange for operating lease liabilities	—	6,676	21,367
Issuance of common stock in connection with the business acquisition	—	5,860	77,122
Tenant improvement allowance capitalized in property and equipment	2,719	—	—
Conversion of convertible notes	—	3,711	—

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

Twist Bioscience Corporation
Notes to Consolidated Financial Statements

1. Organization and description of business

Twist Bioscience Corporation (the "Company") was incorporated in the state of Delaware on February 4, 2013. The Company is a leading, rapidly growing synthetic biology company that has developed a disruptive DNA synthesis platform to industrialize the engineering of biology.

The core of the Company's platform is a proprietary technology that pioneers a new method of manufacturing synthetic DNA by “writing” DNA on a silicon chip. The Company has combined our silicon-based DNA writing technology with proprietary software, scalable commercial infrastructure and an e-commerce platform to create an integrated technology platform that enables us to achieve high levels of quality, precision, automation, and manufacturing throughput at a significantly lower cost than our competitors. The Company has applied its unique technology to manufacture a broad range of synthetic DNA-based products, including synthetic genes, tools for next generation sequencing, or NGS, sample preparation, and antibody libraries for drug discovery and development, all designed to enable its customers to conduct research more efficiently and effectively. The Company has leveraged the same technology to expand its footprint beyond DNA synthesis to manufacture synthetic RNA as well as antibody proteins to disrupt and innovate within larger market opportunities, in addition to discovery partnerships for biologic drugs and developing completely new applications for synthetic DNA, such as digital data storage.

The Company has recognized annual losses from operations since inception and has an accumulated deficit of $1,241.9 million as of September 30, 2024. The Company incurred net losses of $208.7 million, $204.6 million and $217.9 million for the years ended September 30, 2024, 2023, and 2022, respectively. As of September 30, 2024, the Company had cash and cash equivalents of $226.3 million and short-term investments of $50.1 million. The Company expects that its current cash, cash equivalents, and short-term investments will be sufficient to fund its operations for a period of at least one year from the date the Consolidated Financial Statements are issued.

2. Summary of significant accounting policies

Basis of presentation

The consolidated financial statements, which include the Company’s accounts and the accounts of its wholly-owned subsidiaries, are prepared in accordance with U.S. generally accepted accounting principles (or “GAAP”). The Company’s consolidated financial statements included its wholly-owned subsidiaries and Revelar, a variable interest entity ("VIE") for which the Company was the primary beneficiary through September 30, 2022. All intercompany balances and accounts are eliminated in consolidation.

To conform with current fiscal year 2024 presentation, we reclassified $6.8 million of impairment of property and equipment included within restructuring and other costs to impairment of long-lived assets in the consolidated statement of operations and comprehensive loss for the year ended September 30, 2023. This reclassification had no impact on our consolidated statement of operations and comprehensive loss for the year ended September 30, 2023.

Use of estimates

The presentation of consolidated financial statements in conformity with accounting principles generally accepted in the United States requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities as of the date of the consolidated financial statements and the reported amounts of revenue and expenses during the reporting period. Such estimates include the valuation of deferred tax assets, stock-based compensation expense, transaction price and progress toward completion of performance obligation under the contracts with customers, determination of the net realizable value of inventory, valuation and useful life of developed technology and customer relationships, valuation assumptions used in the calculation of the impairment of long-lived assets, restructuring costs and incremental borrowing rate for operating leases. Actual results could differ from those estimates.

Concentration of credit risk

Financial instruments that potentially subject the Company to a concentration of credit risk consist of cash and cash equivalents, short-term investments and accounts receivable. Substantially all of the Company’s cash is held with two financial institutions that management believe are of high credit quality. Such deposits may, at times, exceed federally

insured limits. The Company's investment policy addresses the level of credit exposure by establishing a minimum allowable credit rating and by limiting the concentration in any one investment.

The Company's accounts receivable is derived from customers located principally in the United States, Europe and Asia-Pacific region ("APAC"). The Company performs ongoing credit evaluations of its customers and maintains allowances for potential credit losses on customers' accounts when deemed necessary. The Company does not typically require collateral from its customers. Credit losses historically have not been material. The Company continuously monitors customer payments and maintains an allowance for doubtful accounts based on its assessment of various factors including historical experience, age of the receivable balances, and other current economic conditions or other factors that may affect customers' ability to pay.

Cash and cash equivalents and restricted cash

Cash equivalents that are readily convertible to cash are stated at cost, which approximates fair value. The Company considers all highly liquid investments with an original or remaining maturity of three months or less at the time of purchase to be cash equivalents. Cash equivalents consist of investments in money market funds as of September 30, 2024 and 2023.

Restricted cash represents cash held at financial institutions that are pledged as collateral for stand-by letters of credit for lease commitments. The lease related letters of credit will lapse at the end of the respective lease terms through 2044.

(in thousands)	September 30, 2024	September 30, 2023
Cash and cash equivalents	$ 226,316	$ 286,470
Restricted cash, non-current	2,816	2,811
Total cash, cash equivalents and restricted cash	$ 229,132	$ 289,281

Short-term investments

The Company invests in various types of securities, including United States government, commercial paper, and corporate debt securities. The Company classifies its investments as available-for-sale and records them at fair value based upon market prices at period end.

The Company regularly reviews its short-term investments to identify and evaluate investments that have indications of possible impairment from credit losses or other factors. For available-for-sale debt securities in an unrealized loss position, the Company evaluates whether a current expected credit loss exists based on available information relevant to the credit rating of the security, current economic conditions and reasonable and supportable forecasts. The allowance for credit loss is recorded in other income (expense), net, on the consolidated statements of operations and comprehensive loss, not to exceed the amount of the unrealized loss. Any excess unrealized loss other than the credit loss is recognized in accumulated other comprehensive income or loss in the stockholders' equity section of the consolidated balance sheets. There was no allowance for credit losses relating to the short-term investments recognized as of September 30, 2024.

The cost of securities sold is based on the specific identification method and realized gains and losses are included in other income (expense), net. Dividend and interest income are recognized when earned. The Company may sell these securities at any time for use in current operations.

Accounts receivable and allowance for credit losses

Accounts receivables include amounts billed and currently due from customers, recorded at the net invoice value and are not interest bearing. The Company has a short order-to-invoice lifecycle, as most products can be manufactured within one month. Upon delivery of the products to the customer, the Company invoices the customer. The typical timing of payment is net 30 days. If the right to payment for services performed was conditional on something other than the passage of time, the unbilled amount would be recorded as a separate contract asset.

The Company is exposed to credit losses primarily through accounts receivable from sales of its products and services. The Company maintains an allowance for credit losses for expected uncollectible accounts receivable and contract assets, which is recorded as an offset to accounts receivable or contract assets and provisions for credit losses are recorded in selling, general and administrative expense in the consolidated statements of operations and comprehensive loss. The allowance for current expected credit losses is based on a review of customer accounts and considers historical credit loss information that is adjusted for current economic and business conditions and anticipated future economic events that may impact collectability. In developing its expected credit loss estimate, the Company evaluated the appropriate grouping of accounts receivable and contract assets based upon its evaluation of risk characteristics, including consideration of region and

industries of the customers. Specific allowance amounts are established to record the appropriate provision for customers that have a higher probability of default. The allowance for credit losses is reviewed on a regular basis to assess the adequacy of the allowance and once a receivable is deemed to be uncollectible, such balance is charged against the allowance. Allowance for credit losses were $0.7 million and $0.2 million as of September 30, 2024 and 2023, respectively.

Fair value of financial instruments

The Company applies fair value accounting for all financial and non-financial assets and liabilities that are recognized or disclosed at fair value in the financial statements on a recurring basis. The Company defines fair value as the price that would be received from selling an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. When determining the fair value measurements for assets and liabilities which are required to be recorded at fair value, we consider the principal or most advantageous market in which we would transact and the market-based risk measurements or assumptions that market participants would use in pricing the asset or liability, such as risks inherent in valuation techniques, transfer restrictions and credit risks. See Note 5, Fair value measurements, for more information. The carrying amounts of the Company's financial instruments including cash equivalents, short term investments, and accounts receivable approximate fair value due to their relatively short maturities.

Inventories

Inventories are stated at the lower of cost or net realizable value. Cost is computed using standard cost which approximates actual cost on a first-in, first-out basis. The Company periodically review its inventories to identify obsolete, slow-moving, excess or otherwise unsaleable items. If obsolete, slow-moving, excess or unsaleable items are observed and there are no alternate uses for the inventory, the Company records a write-down to net realizable value through a charge to cost of revenues on our consolidated statements of operations and comprehensive loss. The determination of net realizable value requires judgment, including consideration of many factors, such as estimates of future product demand, past experience, product net selling prices, current and future market conditions, the age and nature of inventories, and potential product obsolescence, among others.

Property and equipment

Property and equipment are stated at cost less accumulated depreciation and amortization. Depreciation and amortization are computed using the straight-line method over the estimated useful lives of the assets or the lesser of the useful life and the remaining lease term of the respective leasehold improvements assets, if any. Upon retirement or sale, the cost of assets
disposed of and the related accumulated depreciation are eliminated from the accounts and any resulting gain or loss is credited or charged to operations in the period recognized. Repairs and maintenance costs are expensed as incurred.

Estimated lives of property and equipment are as follows:

Laboratory equipment	5 Years
Furniture, fixtures and other equipment	5 Years
Computer equipment	3 Years
Vehicles	5 Years
Computer software	3 Years
Leasehold improvements	Lesser of useful life or facilities' lease term

Capitalized software held for internal use

Costs associated with internal-use software systems during the application development stage are capitalized. Capitalization of costs begins when the preliminary project stage is completed, management has committed to funding the project, and it is probable that the project will be completed and the software will be used to perform the function intended. Costs include external direct costs of services and applicable personnel costs of employees devoted to specific software application development. Personnel costs consist of salaries, employee benefit costs, bonuses and stock-based compensation expenses. The capitalized amounts are included in property and equipment, net on the consolidated balance sheets.

Capitalization ceases at the point when the project is substantially complete and is ready for its intended purpose. Capitalized costs are amortized from the project completion date, using the straight-line method over an estimated useful life of the assets.

Finite-lived intangible assets

Finite-lived intangible assets are recorded at cost, net of accumulated amortization, and, if applicable, impairment charges. Amortization of finite-lived intangible assets is recorded over the assets' estimated useful lives on a straight-line basis or based on the pattern in which economic benefits are consumed, if reliably determinable. The Company reviews the finite-lived intangible assets for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. See "Impairment of long-lived assets" for additional information.

Impairment of long-lived assets

The Company's long-lived assets consists of property and equipment, right of use assets and finite-lived intangible assets. The Company evaluates long-lived assets for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. If indicators of impairment are present, the Company tests for recoverability by comparing the estimated undiscounted future cash flows expected to result from the use of the asset over its remaining useful life to the carrying amount of the asset or asset group. If the asset or asset group is determined to be impaired, any excess of the carrying value of the asset or asset group over its estimated fair value is recognized as an impairment loss. Impairment assessments inherently involve judgment as to assumptions about expected future cash flows and the impact of market conditions on those assumptions. See Note 15, *Impairment of long-lived assets* for the additional information and disclosures related to impairment of long-lived assets.

Leases

The Company determines if an arrangement is or contains a lease at inception and classifies each lease as operating or financing. Operating lease right-of-use assets represent the Company's right to use an underlying asset for the lease term and lease liabilities represent the Company's obligation to make lease payments made during the lease term, net of any tenant improvement allowance. Operating lease right-of-use assets and liabilities are recognized at the lease commencement date based on the present value of lease payments over the lease term. In determining the present value of committed lease payments, the Company uses its incremental borrowing rate based on the information available at the lease commencement date which includes significant assumptions made including the Company's estimated credit rating, annual percentage yields from corporate debt financings of companies of similar size and credit rating over a loan term approximating the remaining term of each lease, and government bond yields for terms approximating the remaining term of each lease in countries where the leased assets are located. Certain leases include payments of operating expenses that are dependent on the landlord's estimate, and these variable payments are therefore excluded from the lease payments used to determine the operating lease right-of-use asset and lease liability. Lease terms may include options to extend or terminate the lease when it is reasonably certain that the Company will exercise any such options. Operating lease right-of-use assets are adjusted for prepaid lease payments, lease incentives and initial direct costs incurred. Lease expense is recognized on a straight-line basis over the expected lease term.

The Company elected to not apply the recognition requirements of Topic 842 to short-term leases with terms of 12 months or less which do not include an option to purchase the underlying asset that the Company is reasonably certain to exercise. For short-term leases, lease payments are recognized as operating expenses on a straight-line basis over the lease term. The Company elected to account for lease and non-lease components as a single lease component.

Additional information and disclosures required by Topic 842 are contained in Note 8, *Leases*.

Goodwill

Determining when to test for impairment, the reporting unit, the assets and liabilities of the reporting unit, and the fair value of the reporting unit requires significant judgment and involves the use of significant estimates and assumptions. The Company tests goodwill for impairment in the fourth quarter each year, or more frequently if indicators of an impairment exist. Evaluating goodwill for impairment involves the determination of the fair value of the reporting unit in which goodwill and indefinite-lived intangible assets are recorded using a qualitative or quantitative analysis. If the fair value of the reporting unit exceeds its carrying value, goodwill is considered not impaired. If the carrying value of the reporting unit exceeds its fair value, the Company will record an impairment loss up to the difference between the carrying value and implied fair value.

The Company has an unconditional option to bypass the qualitative assessment in any period and proceed directly to performing the first step of the goodwill impairment test. For 2024, the Company elected to proceed directly to the step-one assessment which indicated that the fair value of its single reporting unit substantially exceeded the carrying value.

Segment information

The Company is a synthetic biology and genomics company that has developed a disruptive DNA synthesis platform to industrialize the engineering of biology and manufactures synthetic genes, tools for next-generation sequencing preparation, and antibody libraries for drug discovery and development and operates as one reportable and operating segment. The Company's chief operating decision-maker, its Chief Executive Officer (CEO), reviews the Company's operating results on an aggregate basis for purposes of allocating resources and evaluating financial performance.

Foreign currency transactions and translation

The Company's consolidated financial statements are presented in U.S. dollars. The functional currency for certain foreign subsidiaries is their local currency. Revenues, expenses, gains and losses for non-U.S. dollar functional currency entities are translated into U.S. dollars using average currency exchange rates for the period. Assets and liabilities for such entities are translated using exchange rates that approximate the rate at the balance sheet date. Foreign currency translation adjustments are recorded as a component of accumulated other comprehensive loss on the Company's consolidated balance sheets. Foreign currency transaction gains and losses on transactions not denominated in functional currency are recorded in Other income (expense), net, on the consolidated statements of operations.

Revenue recognition

The Company recognizes revenue when its customer obtains control of promised goods or services, in an amount that reflects the consideration which the Company expects to receive in exchange for those goods or services. To determine revenue recognition for contracts with customers, the Company performs the following five 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. A performance obligation is a promise in a contract to transfer a distinct good or service to the customer and is the unit of account.

See Note 3, *Revenue recognition*, for detailed discussions of revenue recognition, and how the five steps described above are applied.

Cost of Revenue

Cost of revenues primarily consists of cost incurred in the production and delivery of the Company's products and consists of production materials, personnel costs, cost of expensed equipment and consumables, laboratory supplies, consulting costs, depreciation, production overhead costs, information technology, maintenance and facility costs. Personnel costs consist of salaries, employee benefit costs, bonuses, and stock-based compensation expenses. In addition, cost of revenue includes royalty costs for licensed technologies included in the Company's products, and provisions for slow-moving and obsolete inventory.

Research and development

Research and development expenses consist of compensation costs, employee benefits, subcontractors, research supplies, allocated facility related expenses and allocated depreciation and amortization. All research and development costs are expensed as incurred.

Advertising costs

Costs related to advertising and promotions are expensed to sales and marketing as incurred. Advertising and promotion expenses for the years ended September 30, 2024, 2023 and 2022, were $5.2 million, $2.9 million and $2.4 million, respectively.

Stock-based compensation

The Company maintains performance incentive plans under which incentive and nonqualified stock options, performance-based stock options, restricted stock units, performance-based stock units and through employer purchase plan are granted primarily to employees and may be granted to members of the board of directors and certain non-employee consultants, and employees may participate in an employee stock purchase plan.

The Company recognizes stock compensation in accordance with the Accounting Standard Codification ("ASC") 718, *Compensation—Stock Compensation*. ASC 718 requires the recognition of compensation expense, using a fair value-based method, for costs related to all stock-based payments including stock options, restricted stock units and employee stock purchase plan.

The Company recognizes fair value of stock options granted to employees and non-employees as a stock-based compensation expense over the period in which the related services are received. The Company recognizes forfeitures as they occur. The Company believes that the estimated fair value of stock options is more readily measurable than the fair value of the services rendered.

For performance-based awards, expense is recognized over the period from the grant date to the estimated attainment date, which is the derived service period of the award, if management determines that it is probable that the performance-based vesting conditions will be achieved.

Net loss per share attributable to common stockholders

The Company calculates its basic and diluted net loss per share attributable to common stockholders in conformity with the two-class method required for companies with participating securities. In computing diluted net loss attributable to common stockholders, undistributed earnings are re-allocated to reflect the potential impact of dilutive securities. For purposes of the calculation of diluted net loss per share attributable to common stockholders, unvested shares of common stock issued upon the early exercise of stock options, shares issuable for employee stock purchase plan contributions received, warrants to purchase common stock, unvested restricted common stock, unvested restricted stock units and stock options to purchase common stock are considered potentially dilutive securities but have been excluded from the calculation of diluted net loss per share attributable to common stockholders as their effect is antidilutive.

Basic and diluted net loss per share of common stock attributable to common stockholders is calculated by dividing the net loss attributable to common stockholders by the weighted-average number of shares of common stock outstanding during the period, less shares subject to repurchase, and excludes any dilutive effects of employee stock-based awards and warrants. Because the Company has reported a net loss for the years ended September 30, 2024, 2023 and 2022, diluted net loss per common share is the same as the basic net loss per share for those years.

Income taxes

The Company uses the asset and liability method of accounting for income taxes, in which deferred tax assets and liabilities are recognized for the future tax consequences attributable to the differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases. Deferred tax assets and liabilities are measured using the enacted tax rates expected to apply in the years in which those tax assets and liabilities are expected to be realized. The effect on deferred tax assets and liabilities of a change in tax rates is recognized in the period that includes the enactment date. A valuation allowance is established if it is more likely than not that all or a portion of the deferred tax asset will not be realized.

The Company’s tax positions are subject to income tax audits. The Company recognizes the tax benefit of an uncertain tax position only if it is more likely than not that the position is sustainable upon examination by the taxing authority, based on the technical merits. The tax benefit recognized is measured as the largest amount of benefit which is more likely than not (greater than 50% likely) to be realized upon settlement with the taxing authority. The Company recognizes interest accrued and penalties related to unrecognized tax benefits in its tax provision.

The Company calculates the current and deferred income tax provision based on estimates and assumptions that could differ from the actual results reflected in income tax returns filed in subsequent years. Adjustments based on filed income tax returns are recorded when identified. The amount of income tax paid is subject to examination by U.S. and foreign tax authorities. The estimate of the potential outcome of any uncertain tax issue is subject to management’s assessment of the relevant risks, facts and circumstances existing at that time. To the extent the assessment of such tax position changes, the change in estimate is recorded in the period in which the determination is made.

Variable interest entities

The Company consolidates a VIE in which the Company is deemed to be the primary beneficiary. An entity is generally a VIE if it meets any of the following criteria: (i) the entity has insufficient equity to finance its activities without additional subordinated financial support from other parties, (ii) the equity investors cannot make significant decisions about the entity’s operations or (iii) the voting rights of some investors are not proportional to their obligations to absorb the expected losses of the entity or receive the expected returns of the entity and substantially all of the entity’s activities involve or are conducted on behalf of the investor with disproportionately few voting rights. The Company periodically

makes judgments in determining whether its investees are VIEs and, for each reporting period, the Company assesses whether it is the primary beneficiary of its VIE.

Business combinations

The Company accounts for business combinations using the acquisition method. Under the acquisition method, the purchase price of the acquisition is allocated to the acquired tangible and identifiable intangible assets and assumed liabilities based on their estimated fair values at the time of the acquisition. This allocation involves a number of assumptions, estimates, and judgments that could materially affect the timing or amounts recognized in the Company's financial statements. As a result, the Company may record adjustments to the fair values of assets acquired and liabilities assumed within the measurement period (up to one year from the acquisition date) with the corresponding offset to goodwill. The most subjective areas of the acquisition accounting method include determining the fair value of the following:

- identifiable intangible assets, including the valuation methodology, estimates of projected revenues, technology obsolescence, and discount rates, as well as the estimated useful life of the intangible assets;
- contingent consideration; and
- goodwill, as measured as the excess of consideration transferred over the acquisition date fair value of the assets acquired, including the amount assigned to identifiable intangible assets, and the liabilities assumed.

The assumptions and estimates are based upon comparable market data and information obtained from the management of the acquired business.

Goodwill is assigned to reporting units that are expected to benefit from the synergies of the business combination as of the acquisition date.

Identifiable intangible assets with finite lives are amortized over their estimated useful lives in a pattern in which the asset is consumed. Acquisition-related costs, including advisory, legal, accounting, valuation, and other similar costs, are expensed in the periods in which those costs are incurred. The results of operations of acquired businesses are included in the Company's consolidated financial statements from the acquisition date.

Restructuring and other costs

Restructuring and other costs are comprised of employee separation costs and other associated costs primarily related to implementing a plan. Employee separation costs principally consist of one-time termination benefits and contractual termination benefits for severance, other termination benefit costs, and stock-based compensation expense for the acceleration of stock awards.

The Company records restructuring charges based on whether the termination benefits are provided under an on-going benefit arrangement or under a one-time benefit arrangement. The Company accounts for on-going benefit arrangements, such as those documented by employment agreements, in accordance with ASC 712, Nonretirement Postemployment Benefits. Under ASC 712, liabilities for post employment benefits are recorded at the time the obligations are probable of being incurred and can be reasonably estimated. The Company accounts for one-time employment benefit arrangements in accordance with ASC 420 Exit or Disposal Cost Obligations. One-time termination benefits are expensed at the date the entity notifies the employee, unless the employee must provide future service, in which case the benefits are expensed ratably over the future service period. Other associated costs are recognized in the period in which the liability is incurred.

Recent accounting pronouncements

New accounting guidance adopted

In June 2016, FASB issued ASU No. 2016-13 "Financial Instruments-Credit Losses: Measurement of Credit Losses on Financial Instruments" and has since modified the standard with several ASUs (collectively, "Topic 326"). Topic 326 requires measurement and recognition of expected credit losses for financial assets. The ASU replaced previous incurred loss impairment guidance and established a single expected credit losses allowance framework for financial assets carried at amortized cost. It also eliminated the concept of other-than-temporary impairment and requires credit losses related to certain available-for-sale debt securities to be recorded through an allowance for credit losses. On October 1, 2023, the Company adopted this standard using a modified retrospective approach, which requires a cumulative-effect adjustment to the opening balance of retained earnings to be recognized on the date of adoption and, accordingly, recorded a net increase of $0.1 million to accumulated deficit as of the beginning of fiscal year 2024. In connection with the adoption of Topic 326, the Company made an accounting policy election to not measure an allowance for credit losses for accrued interest receivable.

New accounting guidance issued but not yet effective

In December 2023, the FASB issued ASU No. 2023-09 "Income Taxes (Topic 740)". The amendments in this ASU require that public business entities on an annual basis (1) disclose specific categories in the rate reconciliation and (2) provide additional information for reconciling items that meet a quantitative threshold. The amendments in this update are effective for annual periods beginning after December 15, 2024. The standard is not expected to have a material impact to the Company's consolidated financial statements.

In November 2023, the FASB issued ASU No. 2023-07 "Segment Reporting (Topic 280)". The amendments in this ASU improve reportable segment disclosure requirements, primarily through enhanced disclosures about significant segment expenses. The amendments in this update are effective for fiscal years beginning after December 15, 2023, and interim periods within fiscal years beginning after December 15, 2024. Early adoption is permitted. The standard is not expected to have a material impact to the Company's consolidated financial statements.

The Company has evaluated other recently issued accounting pronouncements and has concluded that the impact of recently issued standards that are not yet effective will not have a material impact on the Company’s financial position or results of operations upon adoption.

3. Revenue

The Company’s revenue is generated through the sale of synthetic biology tools, such as synthetic genes, oligo pools, NGS tools, DNA libraries and biopharma services for antibody discovery, optimization and development ("Biopharma").

Contracts with customers are in the written form of a purchase order or a quotation, which outline the promised goods and the agreed upon price. Such orders may be accompanied by a Master Supply or Distribution Agreement that establishes the terms and conditions, rights of the parties, delivery terms, and pricing. The Company assesses collectability based on a number of factors, including past transaction history and creditworthiness of the customer.

Synthetic genes, oligo pools, NGS tools, and DNA libraries

The Company recognizes revenue when control of the products is transferred to the customer and at a transaction price that is determined based on the agreed upon rates in the applicable order or master supply agreement applied to the quantity of synthetic DNA that was manufactured and shipped to the customer. The transaction price is determined based on the agreed upon rates in the quotation, the purchase order, or the master supply agreements applied to the quantity of all the products that were manufactured and shipped to the customer. The Company’s contracts may include one or more ordered products, and the shipment of these products comprises the performance obligation (s) under the contract. Accordingly, all of the transaction price, net of any discounts, is allocated to the performance obligation (s). The Company’s sales are subject to Ex Works (as defined in Incoterms 2010) delivery terms and revenue, other than Biopharma revenue, is recorded at the point in time when products are picked up by the customer’s freight forwarder, as the Company has determined that this is the point in time that control transfers to the customer. Therefore, upon shipment of the product, there are no remaining performance obligations. The Company’s shipping and handling activities are performed before the customer obtains control of the goods and therefore are considered a fulfillment cost. Shipping and handling fees charged to our customers are recognized as product revenue in the period shipped and the related costs for providing these services are recorded as a cost of revenue. The Company has elected to exclude all sales and value added taxes from the measurement of the transaction price. The Company has not adjusted the transaction price for significant financing since the time period between the transfer of goods and payment is less than one year. The Company has elected the practical expedient to not disclose the consideration allocated to remaining performance obligations and an explanation of when those amounts are expected to be recognized as revenue since the duration of the contracts is less than one year.

Biopharma

The Company’s Biopharma revenue primarily consists of research and development agreements with third parties that provide for up-front and milestone-based payments. The Company also enters into research and development agreements that do not include up-front or milestone-based payments and recognizes revenue on these types of agreements based on the timing of development activities. The Company’s research and development agreements may include more than one performance obligation. At the inception of the agreement, the Company assesses whether each obligation represents a separate performance obligation or whether such obligations should be combined as a single performance obligation. The transaction price for each agreement is determined based on the amount of consideration the Company expects to be entitled to for satisfying all performance obligations within the agreement. The Company assesses the nature of the combined performance obligation to determine whether the combined performance obligation is satisfied over time or at a point in time and, if over time, the appropriate method of measuring progress for purposes of recognizing revenue. In agreements where the Company satisfies performance obligation(s) over time, the Company recognizes development

revenue typically using an input method based on costs incurred relative to the total expected cost which determines the extent of progress toward completion. As part of the accounting for these arrangements, the Company must develop estimates and assumptions that require judgment to determine the transaction price and progress towards completion. The Company reviews its estimate of the transaction price and progress toward completion based on the best information available to recognize the cumulative progress toward completion as of the end of each reporting period and makes revisions to such estimates as necessary. Also, these research and development agreements may include license payments. The Company recognizes revenue from functional license agreements when the license is transferred to the customer and the customer is able to use and benefit from the license. A functional license has significant standalone functionality because it can be used as is for performing a specific task.

Contract balances

The following table summarizes our contract balances:

	September 30,	
(in thousands)	**2024**	**2023**
Contract assets[1]	$ 2,031	$ 2,816
Contract liabilities[2]	2,131	2,999

(1) consists of unbilled amounts primarily related to Biopharma contracts which consists of research and development agreements with third parties.

(2) Generally results from receipt of advance payment before our performance related to Biopharma contracts.

For the years ended September 30, 2024, 2023 and 2022 the Company recognized revenue of $1.7 million, $2.8 million and $1.1 million, respectively, from the amount that was included in the contract liability balance at the beginning of each year.

In addition, for all periods presented, there was no revenue recognized in a reporting period from performance obligations satisfied in previous periods. The aggregate amount of the transaction price allocated to the performance obligations that are unsatisfied as of September 30, 2024 was $8.6 million. The Company expects to recognize revenue over the next twelve months relating to performance obligations unsatisfied as of September 30, 2024.

Based on the nature of the Company's contracts with customers which are recognized over a term of less than 12 months, the Company has elected to use the practical expedient whereby costs to obtain a contract are expensed as they are incurred. The Company states its revenues net of any taxes collected from customers that are required to be remitted to various government agencies. The amount of taxes collected from customers and payable to governmental entities is included on the balance sheet as part of "Accrued expenses and other current liabilities."

Disaggregation of revenues

The table below sets forth revenues by geographic region, based on ship-to destinations. Americas consists of the United States, Canada, Mexico and South America; EMEA consists of Europe, the Middle East, and Africa; and APAC consists of Japan, China, South Korea, India, Singapore, Malaysia and Australia.

	Year ended September 30,		
(in thousands)	**2024**	**2023**	**2022**
Americas	$ 193,884	$ 151,263	$ 122,473
EMEA	92,567	71,389	62,078
APAC	26,523	22,457	19,014
Total	$ 312,974	$ 245,109	$ 203,565

The table below sets forth revenues by products.

(in thousands)	Year ended September 30, 2024	2023	2022
Synthetic genes	$ 92,679	$ 73,541	$ 61,509
Oligo pools	16,906	14,489	12,424
DNA libraries	13,933	10,201	6,149
Antibody discovery	20,328	23,172	24,171
NGS tools	169,128	123,706	99,312
Total	$ 312,974	$ 245,109	$ 203,565

The table below sets forth revenues by industry.

(in thousands)	Year ended September 30, 2024	2023	2022
Industrial chemicals/materials	$ 83,472	$ 59,321	$ 57,940
Academic research	58,452	45,847	37,097
Healthcare	168,959	137,148	106,363
Food/agriculture	2,091	2,793	2,165
Total revenues	$ 312,974	$ 245,109	$ 203,565

Revenue from the United States represented 60%, 60% and 59% of the total revenue for the years ended September 30, 2024, 2023 and 2022, respectively.

Customer concentration

There are no major customers who accounted for 10% or more of the Company's revenue for the fiscal year ended September 30, 2024, September 30, 2023 and September 30, 2022.

There were no major customers who accounted for 10% or more of the net accounts receivable as of September 30, 2024. There was one customer who accounted for 10% or more of the net accounts receivable as of September 30, 2023.

4. Cash, cash equivalent and investments

The following table sets forth the cash and cash equivalents, and investments as of September 30, 2024:

(in thousands)	Amortized cost	Gross unrealized gains	Gross unrealized losses	Fair value
Cash	$ 26,458	$ —	$ —	$ 26,458
Cash equivalents - money market funds	199,858	—	—	199,858
Total cash and cash equivalents	$ 226,316	$ —	$ —	$ 226,316
Short-term investments:				
U.S. government treasury bills	$ 49,964	$ 119	$ —	$ 50,083
Total short-term investments	$ 49,964	$ 119	$ —	$ 50,083
Non-current assets - equity investment in privately held companies	$ 1,525	$ —	$ —	$ 1,525
Total cash, cash equivalents and investments	$ 277,805	$ 119	$ —	$ 277,924

The following table sets forth the cash and cash equivalents, and investments as of September 30, 2023:

(in thousands)	Amortized cost	Gross unrealized gains	Gross unrealized losses	Fair value
Cash	$ 40,816	$ —	$ —	$ 40,816
Cash equivalents - money market funds	245,654	—	—	245,654
Total cash and cash equivalents	$ 286,470	$ —	$ —	$ 286,470
Short-term investments:				
Corporate bonds	$ 14,918	$ —	$ (29)	$ 14,889
U.S. government treasury bills	35,111	—	(57)	35,054
Total short-term investments	$ 50,029	$ —	$ (86)	$ 49,943
Non-current assets - equity investment in privately held companies	3,711	—	—	3,711
Total cash, cash equivalents and investments	$ 340,210	$ —	$ (86)	$ 340,124

During the years ended September 30, 2024, 2023 and 2022, gross realized gains and losses related to our short-term investments were not material.

During the years ended September 30, 2024, 2023 and 2022, the Company did not recognize any credit losses.

5. Fair value measurement

The Company determines the fair value of financial and non-financial assets and liabilities using the fair value hierarchy which requires an entity to maximize the use of observable inputs and minimize the use of unobservable inputs when measuring fair value. The standard describes three levels of inputs that may be used to measure fair value:

Level 1—Quoted prices in active markets for identical assets or liabilities.

Level 2—Observable inputs other than Level 1 prices such as quoted prices for similar assets or liabilities, quoted prices in markets that are not active, or other inputs that are observable or can be corroborated by observable market data for substantially the full term of the assets or liabilities.

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.

In determining fair value, the Company utilizes valuation techniques that maximize the use of observable inputs and minimize the use of unobservable inputs to the extent possible as well as considering counterparty credit risk in its assessment of fair value.

Assets measured at fair value on a recurring basis

As of September 30, 2024, financial assets measured and recognized at fair value are as follows:

(in thousands)	Level 1	Level 2	Level 3	Fair value
Assets				
Money market funds	$ 199,858	$ —	$ —	$ 199,858
U.S. government treasury bills	50,083	—	—	50,083
Total financial assets	$ 249,941	$ —	$ —	$ 249,941

As of September 30, 2023, financial assets measured and recognized at fair value are as follows:

(in thousands)	Level 1	Level 2	Level 3	Fair value
Assets				
Money market funds	$ 245,654	$ —	$ —	$ 245,654
Corporate Bonds	—	14,889	—	14,889
U.S. government treasury bills	35,054	—	—	35,054
Total financial assets	$ 280,708	$ 14,889	$ —	$ 295,597

Contractual maturities of short-term investments, as of September 30, 2024, were less than 12 months. The Company does not intend to sell the money market funds and short term investments and it is not more likely than not that the Company will be required to sell the investments before recovery of their amortized cost basis.

As of September 30, 2024 and 2023, there are no financial liabilities measured and recognized at fair value.

The following table provides a reconciliation of beginning and ending balances of the financial liabilities during the years ended September 30, 2023 and 2022:

(in thousands)	Holdbacks Level 2	Contingent consideration Level 3	Total fair value
Balance at September 30, 2022	$ 5,093	$ 2,100	$ 7,193
Change in fair value	(3,326)	(2,100)	(5,426)
Settlement	(1,767)	—	(1,767)
Balance at September 30, 2023	$ —	$ —	$ —

In June 2023, the indemnity holdback period ended, and the Company issued 104,727 shares valued of its common stock at $1.8 million along with an immaterial cash payment for fractional shares to satisfy the indemnity holdback. The estimated fair value of the holdback liability decreased as a result of the change in the Company's stock price between September 30, 2022 and the date of settlement of the holdback liability.

At September 30, 2022, the contingent consideration liability in connection with the acquisition of AbX Biologics, Inc., a privately-held company providing in vivo antibody discovery services ("Abveris") was $2.1 million based on management's determined that the revenue target for the calendar year 2022 was probable of being achieved. During the year September 30, 2023, management determined that the revenue target for the calendar year 2022 was not achieved, and therefore, a change in fair value of contingent consideration of $2.1 million was recognized, resulting in the extinguishment of the contingent consideration liability of $2.1 million.

Assets and liabilities without readily determinable values measured on a non-recurring basis

During 2021 and as amended in 2022, the Company entered into convertible promissory note agreements with a privately held company ("Borrower") pursuant to which the Company agreed to loan to the Borrower $3.5 million in a series of loan installments, evidenced by a convertible promissory note having a maturity date of May 1, 2023 ("Convertible Note"). The

Convertible Note included an option to convert the Convertible note into the Borrower's equity at the Borrower's next round of equity financing, and accrued interest at a rate of 4% per annum. In April 2023, the Company exercised the option and the Borrower issued to the Company ordinary shares which represent a 15% equity interest. As of September 30, 2024, the Company's equity investments were categorized as Level 3 within the fair value hierarchy.

The equity investment held by the company is a VIE, but the Company is not the primary beneficiary. The Company does not have the power to direct the activities that most significantly impact the economic performance of the investee. The Company's maximum exposure to loss from this VIE consists of equity investment of $1.5 million**.** Equity investments held by the Company lack readily determinable fair values and therefore the securities are measured at cost minus impairment, if any, plus or minus changes resulting from observable price changes in orderly transactions for the identical or similar equity securities of the same issuer. The Company reviews the carrying value of its equity investments for impairment whenever events or changes in business circumstances indicate the carrying amount of such asset may not be fully recoverable. Impairments, if any, are based on the excess of the carrying amount over the recoverable amount of the asset. The Company recorded $2.2 million of impairments during the years ended September 30, 2024. There were no such impairments during the years ended September 30, 2023 and 2022.

Changes in level 3 financial assets and liabilities

There were no transfers between Level 1, Level 2 and Level 3 in the periods presented.

The following table provides a reconciliation of beginning and ending balances of the Level 3 financial assets and liabilities during the years ended September 30, 2024 and 2023:

(in thousands)	Contingent consideration	Equity investments
Balance as of September 30, 2022	$ 2,100	$ 3,711
Change in fair value	(2,100)	—
Additions during the year	—	—
Balance as of September 30, 2023	$ —	$ 3,711
Additions during the year	—	—
Impairment	—	(2,186)
Balance as of September 30, 2024	$ —	$ 1,525

6. Balance sheet components

Inventories

Inventories consist of the following:

	September 30,	
(in thousands)	2024	2023
Raw Materials	$ 17,316	$ 27,024
Work-in-process	2,146	1,113
Finished Goods	4,616	3,926
	$ 24,078	$ 32,063

There is no consigned inventory balance as of September 30, 2024 and 2023.

Property and Equipment, net

Property and Equipment, net consists of the following:

(in thousands)	September 30, 2024	September 30, 2023
Laboratory equipment	$ 99,528	$ 104,508
Furniture, fixtures and other equipment	2,944	3,484
Vehicles	211	85
Computer equipment	3,249	3,103
Computer software	10,095	5,507
Leasehold improvements	57,448	57,271
Construction in progress	4,688	8,528
	$ 178,163	$ 182,486
Less: Accumulated depreciation and amortization	(75,643)	(50,656)
	$ 102,520	$ 131,830

Construction in progress mainly represents equipment costs and internal use software development costs. For the year ended September 30, 2024 and 2023 the total depreciation and amortization expense was $27.3 million and $24.1 million, respectively. During the years ended September 30, 2024 and 2023, the Company recognized impairment of property and equipment of $44.9 million and $6.8 million, respectively. See Note 15 for details.

The net book value of capitalized computer software held for internal use included in property and equipment, net were $5.2 million and $3.2 million as of September 30, 2024 and 2023, respectively. For the year ended September 30, 2024 and 2023, the amortization expense of capitalized computer software held for internal use was $2.6 million and $0.9 million, respectively.

Property and equipment, net located in the United States were $102.3 million and $131.2 million as of September 30, 2024 and 2023, respectively. Property and equipment, net located outside of the United States were $0.2 million and $0.6 million as of September 30, 2024 and 2023, respectively.

Other current liabilities

Other current liabilities consist of the following:

(in thousands)	September 30, 2024	September 30, 2023
Income and other taxes payable	$ 2,725	$ 4,374
Contract liabilities	2,131	2,999
Other current liabilities	961	430
	$ 5,817	$ 7,803

7. Goodwill and intangible assets

Total amortization expense related to intangible assets was $4.1 million, $5.3 million, and $4.9 million for the years ended September 30, 2024, 2023 and 2022, respectively.

The goodwill balance is presented below:

(in thousands)	September 30, 2024	September 30, 2023
Balance at beginning of year	85,811	85,811
Balance at end of year	$ 85,811	$ 85,811

The finite-lived intangible assets balances are presented below:

(in thousands, except for years)	September 30, 2024				
	Weighted average Amortization period in years	Gross carrying amount	Impairment	Accumulated amortization	Net book value
Developed Technology	17	$ 50,020	$ (25,198)	$ (10,344)	$ 14,478
Customer Relationships	—	15,210	(10,541)	(4,669)	—
Tradenames & Trademarks	—	900	(125)	(775)	—
Total finite-lived intangible assets		$ 66,130	$ (35,864)	$ (15,788)	$ 14,478

(in thousands, except for years)	September 30, 2023			
	Weighted average Amortization period in years	Gross carrying amount	Accumulated amortization	Net book value
Developed Technology	15	$ 50,020	$ (7,636)	$ 42,384
Customer Relationships	11	15,210	(3,461)	11,749
Tradenames & Trademarks	3	900	(550)	350
Total finite-lived intangible assets		$ 66,130	$ (11,647)	$ 54,483

Future annual amortization expense is as follows (in thousands):

Years ending September 30,	
2025	$ 1,053
2026	1,053
2027	1,053
2028	1,053
2029	1,053
Thereafter	9,213
	$ 14,478

8. *Leases*

The Company leases certain of its facilities under non-cancellable operating leases expiring at various dates through 2044. The Company is also responsible for utilities, maintenance, insurance, and property taxes under these leases. Our lease payments consist primarily of fixed rental payments for the right to use the underlying leased assets over the lease terms, as well as payments for common-area-maintenance and administrative services. We often receive customary incentives from our landlords, such as reimbursements for tenant improvements and rent abatement periods, which effectively reduce the total lease payments owed for these leases. Leases are classified as operating or financing at commencement. We do not have any material financing leases.

Certain leases include options to renew or terminate at the Company's discretion. The lease terms include periods covered by these options if it is reasonably certain the Company will renew or not terminate. The Company's lease agreements do not contain any material residual value guarantees or restrictive covenants.

On May 30, 2023, Abveris, the Company's subsidiary, entered into an amendment to its existing lease agreement for approximately 17,200 square-feet primarily consisting of two additional spaces located in Quincy, Massachusetts, to further expand operations. The term of the lease for both spaces ends on August 31, 2032. The Company has two options to extend the term for five years. The Company does not have reasonable certainty that these options will be exercised. Upon execution of the lease agreement, the Company provided the landlord an additional approximate $0.5 million irrevocable letter of credit as a security deposit. The annual base rent for premises A will increase by 2.0% each year for the first two years and then 2.75% for each year thereafter plus certain operating expenses. The annual base rent for premises B will increase by 2.75% each year, plus certain operating expenses. The Company has the right to sublease the facility, subject to landlord consent. The premises A and B lease commenced in June 2023 and August 2023, respectively. As of the lease commencement dates, the total future minimum lease payments under the agreement was $8.6 million.

The following table presents the Company's right-of-use assets and lease liabilities related to the Company's operating leases as of September 30, 2024 and 2023 is as follows:

	September 30,	
(in thousands)	**2024**	**2023**
Assets:		
Operating lease right-of-use-assets	$ 58,829	$ 71,531
Current liabilities:		
Current portion of operating lease liabilities	$ 14,805	$ 14,896
Noncurrent liabilities:		
Operating lease liabilities, net of current portion	$ 70,221	$ 79,173

Future minimum lease payments under all non-cancelable operating leases as of September 30, 2024 are as follows:

(in thousands)	**Operating leases**
Years ending September 30:	
2025	$ 14,814
2026	13,885
2027	8,371
2028	8,471
2029	6,609
Thereafter	81,405
Total minimum lease payments	$ 133,555
Less: imputed interest	(48,529)
Total operating lease liabilities	$ 85,026
Less: current portion	(14,805)
Operating lease liabilities, net of current portion	$ 70,221

The components of lease expense and supplemental information were as follows:

	September 30,	
(in thousands except years and percentage)	**2024**	**2023**
Operating lease costs	$ 15,637	$ 16,182
Variable lease costs	7,724	6,194
Weighted-average remaining lease term (in years) - operating leases	15.21 years	15.37 years
Weighted-average discount rate - operating leases	6.52 %	6.54 %

Supplemental cash flow information related to leases are as follows:

(in thousands)	September 30, 2024	September 30, 2023
Cash payments included in the measurement of operating lease liabilities	$ 14,707	$ 14,604

9. Commitments and contingencies

Legal Proceedings

The Company may be subject to litigation, claims and disputes in the ordinary course of business. Certain significant matters are described below. We recognize accruals for matters to the extent that we conclude that a loss is both probable and reasonably estimable. If we determine that a material loss is reasonably possible and the loss or range of loss can be estimated, we disclose the possible loss.

Securities Class Action

On December 12, 2022, a putative securities class action lawsuit captioned Peters v. Twist Bioscience Corporation, et al., Case No. 22-cv-08168 (N.D. Cal.) ("Securities Class Action") was filed in federal court in the Northern District of California ("Court") against the Company, its Chief Executive Officer, and its Chief Financial Officer (the "Defendants") alleging violations of federal securities laws. The Securities Class Action's claims are based in large part on allegations made in a report issued on November 15, 2022 by Scorpion Capital ("Scorpion Report") concerning, among other things, the Company's DNA chip technology and accounting practices. The initial complaint filed in the Securities Class Action alleges that various statements that the defendants made between December 13, 2019 and November 14, 2022 were materially false and misleading in light of the allegations in the Scorpion Report. The plaintiff who initiated the lawsuit sought to represent a class of shareholders who acquired shares of the Company's common stock between December 13, 2019 and November 14, 2022 and sought damages as well as certain other costs. On July 28, 2023, the Court appointed a new plaintiff, not the original plaintiff who filed the case, as lead plaintiff in the case and appointed a new law firm as lead counsel. On October 11, 2023, the lead plaintiff filed an amended complaint. The amended complaint is purportedly brought on behalf of all persons other than the Defendants who acquired the Company's securities between December 20, 2018 and November 15, 2022. The amended complaint alleges that certain statements regarding, among other things, the Company's DNA products and accounting practices were false and misleading.

This case remains in the preliminary stage. Given the inherent uncertainty of litigation and the legal standards that must be met, including class certification and success on the merits, the Company cannot express an opinion on the likelihood of an unfavorable outcome or on the amount or range of any potential loss. The Company and the other defendants intend to vigorously defend themselves against the claims asserted against them and filed a motion to dismiss the amended complaint on December 6, 2023. A hearing on the motion to dismiss was held on November 13, 2024 and the Company is now awaiting the judge's decision.

Derivative Action

On September 25, 2023, a shareholder derivative suit captioned Shumacher vs. Leproust et al., No. 1:23-cv-01048-UNA, was filed in the United States District Court for the District of Delaware against directors of the Company and an employee (the "Derivative Action"). The suit is based on substantially the same allegations in the Securities Class Action and seeks to recover, on behalf of the Company, damages to the Company arising from, among other things, the Securities Class Action. On November 13, 2023, the parties to the Derivative Action entered into a stipulation staying the Derivative Action pending resolution of the anticipated motion to dismiss the defendants have filed in the Securities Class Action.

Indemnifications

In the ordinary course of business, the Company enters into agreements that may include indemnification provisions. Pursuant to such agreements, the Company may indemnify, hold harmless and defend the indemnified parties for losses suffered or incurred by the indemnified party. Some of the provisions will limit losses to those arising from third-party actions. In some cases, the indemnification will continue after the termination of the agreement. The maximum potential amount of future payments the Company could be required to make under these provisions is not determinable. To date, the Company has not incurred material costs to defend lawsuits or settle claims related to these indemnification provisions. From time to time, the Company has entered into indemnification agreements with its directors and officers that requires it to indemnify its directors and officers against liabilities that may arise by reason of their status or service as directors or officers to the fullest extent permitted by law. The Company also has directors' and officers' insurance.

10. Related party transactions

During the years ended September 30, 2024, 2023 and 2022, the Company purchased raw materials from related parties in the amount of $4.4 million, $6.8 million and $8.0 million, respectively. During the years ended September 30, 2024, 2023 and 2022, the Company recognized revenues from the related parties in the amount of $12.1 million, $5.9 million and $3.5 million, respectively. Payable balances with the related parties were immaterial as of September 30, 2024, 2023 and 2022. Receivable balances with the related parties were $0.5 million and $1.7 million as of September 30, 2024 and 2023, respectively.

11. Income taxes

The Company recorded income tax expense of $0.6 million and $1.2 million for the years ended September 30, 2024 and 2023, respectively. The Company recorded an income tax benefit of $10.4 million for the year ended September 30, 2022.

The domestic and foreign components of pre-tax loss for the years ended September 30, 2024, 2023, and 2022 are as follows:

	Year ended September 30,		
(in thousands)	2024	2023	2022
US	$ (209,545)	$ (205,389)	$ (231,659)
Foreign	1,379	1,923	3,385
Total	$ (208,166)	$ (203,466)	$ (228,274)

The components of the income tax expense for the years ended September 30, 2024, 2023, and 2022 are as follows:

	Year ended September 30,		
(in thousands)	2024	2023	2022
Current			
Federal	$ —	$ —	$ —
State	20	9	(1)
Foreign	540	1,143	767
Total current	$ 560	$ 1,152	$ 766
Deferred			
Federal	$ —	$ —	$ (9,765)
State	—	—	(1,412)
Foreign	—	—	—
Total deferred	$ —	$ —	$ (11,177)
Total provision (benefit)	$ 560	$ 1,152	$ (10,411)

The following is a reconciliation of the statutory federal income tax rate to the Company's effective tax rate for the years ended September 30, 2024, 2023, and 2022:

	Year ended September 30,		
	2024	2023	2022
Tax expense computed at the federal statutory rate	21 %	21 %	21 %
Change in valuation allowance	(22)%	(25)%	(13)%
Research and development credit benefit	3 %	5 %	4 %
Business combination	— %	— %	(4)%
Stock-based compensation	(1)%	(1)%	(1)%
Change in fair value of contingent consideration and holdbacks	— %	1 %	(1)%
Gain on deconsolidation of variable interest entity	— %	— %	(1)%
Others	(1)%	(2)%	— %
Total income tax expense	— %	(1)%	5 %

The significant components of the Company's deferred tax assets and liabilities are as follows for the years ended September 30, 2024, and 2023:

	September 30,	
(in thousands)	2024	2023
Net operating loss carryforwards	$ 226,959	$ 209,338
Research and development credit carryforwards	59,578	49,454
Capitalized research and development	43,232	30,599
Operating lease liability	21,377	22,921
Stock-based compensation	13,384	13,858
Other	14,310	8,107
Gross deferred tax assets	$ 378,840	$ 334,277
Less: Valuation allowance	(360,594)	(302,381)
Net deferred tax assets	$ 18,246	$ 31,896
Fixed assets	$ —	$ (1,363)
Operating lease right-of-use asset	(14,786)	(17,417)
Intangible assets	(3,460)	(13,116)
Gross deferred tax liabilities	$ (18,246)	$ (31,896)
Total net deferred tax asset	$ —	$ —

Based on the available objective evidence, management believes it is more likely than not that the deferred tax assets will not be fully realizable. Accordingly, the Company has provided a full valuation allowance against its deferred tax assets at September 30, 2024 and 2023. The valuation allowance was $360.6 million and $302.4 million as of September 30, 2024 and 2023, respectively. The change in the valuation allowance was mainly due to an increase in the net operating loss, research and development credits and capitalized research and development during the fiscal year 2024.

The Company intends to continue maintaining a full valuation allowance on the Company's deferred tax assets until there is sufficient evidence to support the reversal of all or some portion of the allowance. The release of all, or a portion, of the valuation allowance would result in the recognition of certain deferred tax assets and a decrease to income tax expense for the period the release is recorded.

As of September 30, 2024, the Company had net operating loss carryforwards of approximately $903.1 million and $588.4 million available to reduce future taxable income, if any, for federal and state income tax purposes, respectively. Of the total federal net operating loss carryforwards, $702.0 million never expires and the remaining carryforwards of $201.1 million expire at various dates beginning in 2032 through 2038. Of the total state net operating loss carryforwards, the California State tax loss carryforwards of $29.7 million begin to expire in 2033 and the remaining carryforwards of $293.6 million for other states begin to expire at various dates beginning 2025 and beyond.

The Company also had federal and state research and development credit carryforwards of approximately $51.0 million and $34.4 million, respectively, at September 30, 2024. The federal credits will expire starting in 2033 if not utilized. The California research and development credits have no expiration date. Utilization of the net operating losses and tax credits

is subject to annual limitation due to the ownership change limitations provided by the Internal Revenue Code and similar state provisions. Such annual limitations may result in the expiration of the net operating losses and tax credits before utilization.

The provisions of ASC 740-10, *Accounting for Uncertainty in Income Taxes*, prescribe a comprehensive model for the recognition, measurement, and presentation and disclosure in financial statements of any uncertain tax positions that have been taken or expected to be taken on a tax return. The Company has identified uncertain tax positions related to federal and state research and development credits and foreign jurisdictions.

The aggregate changes in the balance of gross unrecognized tax benefits are as follows:

(in thousands)	Federal and state
Balance as of September 30, 2021	$ 7,437
Increases related to tax positions taken during 2022	5,082
Increases related to tax positions taken in the prior year	864
Balance as of September 30, 2022	$ 13,383
Increases related to tax positions taken during 2023	5,043
Increases related to tax positions taken in the prior year	759
Balance as of September 30, 2023	$ 19,185
Increases related to tax positions taken during 2024	$ 3,354
decreases related to tax positions taken in the prior year	(127)
Balance as of September 30, 2024	$ 22,412

The Company does not expect a material change in unrecognized tax benefits in the next twelve months. As of September 30, 2024 and 2023, approximately $0.4 million and $0.4 million of unrecognized tax benefit would, if recognized, impact the Company's effective income tax rate, respectively.

It is the Company's policy to include penalties and interest expense related to income taxes as a component of other expense and interest expense, respectively, as necessary. The Company's management determined that no accrual for interest and penalties was required as of September 30, 2024 and 2023.

The Company's files federal and state income tax returns with varying statutes of limitations. All tax years remain open to examination due to the carryover of net operating losses or tax credits. The Company currently has no federal or state tax examinations in progress.

In fiscal year 2022, the Company began recognizing an additional component of total Federal tax expense, the tax on Global Intangible Low-Taxed Income ("GILTI") provision of the Tax Act, which became applicable to the Company in fiscal year 2022. The Company elected to account for GILTI as a period cost, and therefore included GILTI expense in the effective tax rate calculation. This provision did not have a material effect on the effective tax rate for the years ended September 30, 2024, 2023 and 2022.

12. Common stock

As of September 30, 2024, the Company had reserved sufficient shares of common stock with a par value of $0.00001 per share for issuance upon exercise of outstanding stock options. Each share of common stock is entitled to one vote. The holders of shares of common stock are also entitled to receive dividends whenever funds are legally available and when declared by the board of directors.

In February 2022, the Company completed an underwritten public offering of 5,227,272 shares of its common stock at a price to the public of $55.00 per share, including the full exercise of underwriters' option to purchase an additional 681,818 shares of common stock. The Company received total net proceeds from the offering of $269.8 million, net of underwriting discounts and commissions and offering expenses.

13. Stock-based compensation

2018 Equity Incentive Plan

On September 26, 2018, the board of directors adopted the 2018 Equity Incentive Plan (the 2018 Plan) as a successor to the 2013 Stock Plan (the 2013 Plan). The maximum aggregate number of shares that may be issued under the 2018 Plan is 6,856,405 of the Company's common stock. The number of shares reserved for issuance under the 2018 Plan will be increased automatically on the first day of each fiscal year, following the fiscal year in which the 2018 Plan became effective, by a number equal to the least of 999,900, 4% of the shares of common stock outstanding at that time, or such number of shares determined by the Company's board of directors. The common shares issuable under the 2018 Plan are registered pursuant to a registration statement on Form S-8 on November 1, 2018.

Inducement Equity Incentive Plan

On August 22, 2023, the board of directors adopted an inducement equity incentive plan (the "Inducement Plan). The maximum aggregate number of shares that may be issued under the Inducement Plan is 700,000 of the Company's common stock. The Inducement Plan permits the grant of non-statutory stock options, restricted stock, restricted stock units, stock appreciation rights, performance units and performance shares. The shares issuable under the Inducement Plan are registered pursuant to a registration statement on Form S-8 filed with the Securities and Exchange Commission on August 25, 2023.

As of September 30, 2024, a total of 1,618,728 shares of the Company's common stock have been reserved for issuance under the 2018 Plan and the Inducement Plan.

Any shares subject to outstanding awards under the 2013 Plan that are canceled or repurchased subsequent to the 2018 Plan's effective date are returned to the pool of shares reserved for issuance under the 2018 Plan. Awards granted under the 2018 Plan may be non-statutory stock options, stock appreciation rights, restricted stock, restricted stock units, performance shares, and performance units.

Restricted Stock Units

Restricted stock consists of restricted stock unit awards (RSUs) which have been granted to employees and non-employee directors. The value of an RSU award is based on the Company's stock price on the date of grant. Employee grants generally vest over four years and non-employee director grants generally vest over one year. Forfeitures of RSUs are recognized as they occur. The shares underlying the RSU awards are not issued until the RSUs vest. Upon vesting, each RSU converts into one share of the Company's common stock.

Activity with respect to the Company's restricted stock units during the year ended September 30, 2024 is as follows:

(In thousands, except per share data)	Shares	Weighted average grant date fair value per share
Nonvested shares at September 30, 2023	1,620	$ 40.73
Granted	1,523	$ 28.01
Vested/Issued	(786)	39.39
Forfeited	(393)	37.29
Nonvested shares at September 30, 2024	1,964	$ 32.13

As of September 30, 2024, there was $55.9 million of total unrecognized compensation cost related to these issuances that is expected to be recognized over a weighted average period of 2.5 years. The total grant date fair value of RSUs awarded during the year ended September 30, 2024, 2023 and 2022 were $42.7 million, $32.2 million and $96.2 million, respectively. The total grant date fair value of RSUs vested during the year ended September 30, 2024, 2023 and 2022 were $31.0 million, $33.7 million and $27.1 million, respectively.

Performance Stock Units

Performance stock unit awards ("PSUs") granted to Company executives will vest upon achievement of multiple year revenue, gross profit and cash balance metrics as determined by the board of directors, and to certain non-employee consultants will vest upon achievement of operational milestones. Stock compensation expense for PSUs is recorded over the vesting period based on the grant date fair value of the awards and probability of the achievement of specified performance targets. The grant date fair value is equal to the closing share price of the Company's common stock on the date of grant. For Company executives, PSUs generally vest over a two to three-year service period following the grant date, provided that the recipient is a Company employee at the time of vesting and the performance targets applicable to each award are achieved. For non-employees, PSUs generally vest over a one to three-year service period following the grant date, provided that the performance targets applicable to each award are achieved. The percentage of PSUs that vest

will depend on the achievement of specified performance targets at the end of the performance period and can range from 0% to 150% of the number of units granted. Any PSUs that are unvested at the end of the performance period are forfeited. Forfeitures of PSUs are recognized as they occur.

Activity under the PSUs during the year ended September 30, 2024 is summarized below:

(In thousands, except per share data)	Shares	Weighted average grant date fair value per share
Nonvested shares at September 30, 2023	932	$ 36.82
Granted	617	$ 18.71
Vested/Issued	(87)	79.66
Forfeited	(296)	25.19
Nonvested shares at September 30, 2024	1,166	$ 27.01

As of September 30, 2024, the unrecognized compensation costs related to these awards was $9.5 million, based on the maximum achievement of the performance targets. The Company expects to recognize those costs over a weighted average period of 1.4 years. The total grant date fair value of PSUs awarded during the year ended September 30, 2024, 2023 and 2022 were $11.5 million, $21.2 million and $49.0 million, respectively. The total grant date fair value of PSUs vested during the year ended September 30, 2024, 2023 and 2022 were $6.9 million, $1.8 million and $0.5 million, respectively.

Options

Options are generally granted to employees and were granted to non-employee directors until fiscal year 2022. Stock options entitle the holder to purchase, at the end of the vesting term, a specified number of shares of Company common stock at an exercise price per share equal to the closing market price of the common stock on the date of grant. Stock options have a contractual life from the date of the grant and a vesting schedule as established by the board of directors. The maximum term of stock options granted under the 2018 Plan is 10 years and the awards generally vest over a four-year period. Forfeitures of options are recognized as they occur. The fair value of each services based stock option grant is estimated on the date of grant using the Black-Scholes option-pricing model. The Company historically had been a private company and lacked company-specific historical and implied volatility information for its stock. Therefore, it estimated its expected stock price volatility based on the historical volatility of publicly traded peer companies and utilized the "simplified" method for awards that qualify as "plain-vanilla" options. As determined under the simplified method, the expected term of stock options granted is calculated based on contractual and vesting terms of the option award, the risk-free interest rate is determined by reference to the U.S. Treasury yield curve in effect at the time of grant of the award for time periods approximately equal to the expected term of the award and the expected dividend yield is zero based on the fact that the Company has never paid cash dividends on common stock and does not expect to pay any cash dividends in the foreseeable future.

Options activity during the year ended September 30, 2024 is summarized below:

(In thousands, except per share data)	Shares	Weighted average exercise price per share	Weighted average remaining contractual term (years)	Aggregate intrinsic value
Outstanding at September 30, 2023	2,119	$ 24.18	5.25	$ 6,715
Forfeited	(116)	38.41	—	—
Exercised	(384)	18.50	—	$ 9,202
Outstanding at September 30, 2024	1,619	$ 24.51	4.27	$ 36,798
Nonvested at September 30, 2024	3	$ 106.55	6.94	—
Exercisable at September 30, 2024	1,616	$ 24.35	4.27	$ 36,798

As of September 30, 2024, the unrecognized compensation costs related to these awards was $0.2 million. The Company expects to recognize those costs over a weighted average period of 1.0 years. The Company did not grant any options during the year ended September 30, 2024 and 2023. The total grant date fair value of stock options awarded during the

year ended September 30, 2022 was $15.8 million. The aggregate intrinsic value of stock options exercised during the year ended September 30, 2023 and 2022 were $1.1 million and $31.9 million, respectively.

The fair value of options granted during the year ended September 30, 2022 were calculated using the weighted average assumptions set forth below:

	Year ended September 30,
	2022
Expected term (years)	6.0
Expected volatility	70.7 %
Risk-free interest rate	1.4 %
Dividend yield	—%

Performance Stock Options

On September 1, 2020, the board of directors approved the implementation of a revised annual equity award program for executive officers, senior level employees and consultants to be granted as performance-based stock options ("PSOs") under the 2018 Plan. The PSOs issued to executive officers and senior level employees vested in prior years. The number of PSOs ultimately earned under the awards to a consultant is calculated based on the achievement of certain operational milestones. The maximum term of performance stock options granted under the 2018 Plan is 10 years for both employees and non-employees. The awards generally vest over a two-year period for executive officers and senior level employees. Awards to non-employees generally vest over a five-year period.

The provisions of the PSO are considered a performance condition, and the effects of that performance condition are not reflected in the grant date fair value of the awards. The Company used the Black-Scholes method to calculate the fair value at the grant date without regard to the vesting condition and will recognize compensation cost for the options that are expected to vest. Forfeitures of PSOs are recognized as they occur. The Company reassesses the probability of the performance condition at each reporting period and adjusts the compensation cost based on the probability assessment. As of September 30, 2024, the Company determined that 30,000 shares are expected to vest based on the probability of the performance condition that will be achieved under this equity award program.

Activity under the PSOs during the year ended September 30, 2024 is summarized below:

(In thousands, except per share data)	Shares	Weighted average exercise price per share	Weighted average remaining contractual term (years)	Aggregate intrinsic value
Outstanding at September 30, 2023	289	$ 60.82	7.37	$ —
Forfeited	(17)	77.10	—	—
Outstanding at September 30, 2024	272	$ 59.83	6.39	$ 1,042
Nonvested at September 30, 2024	30	$ 31.29	7.57	$ 417
Exercisable at September 30, 2024	242	$ 63.36	6.24	$ 625

As of September 30, 2024, the unrecognized compensation costs related to these awards was $0.1 million. The Company expects to recognize those costs over a weighted average period of 0.6 years. The Company did not grant any PSOs during the year ended September 30, 2024 and 2023. The total grant date fair value of PSOs awarded during the year ended September 30, 2022 was $1.5 million.

The fair values of PSOs granted during the year ended September 30, 2022 were calculated using the weighted average assumptions set forth below:

	Year ended September 30,
	2022
Expected term (years)	5.9
Expected volatility	70.9%
Risk-free interest rate	2.8%
Dividend yield	—%

Stock-based compensation

Total stock-based compensation expense recognized were as follows:

	Year ended September 30,		
(in thousands)	2024	2023	2022
Cost of revenues	$ 4,012	$ 4,562	$ 4,587
Research and development	11,199	13,944	19,541
Selling, general and administrative	35,714	11,772	54,905
Total stock-based compensation	$ 50,925	$ 30,278	$ 79,033

An immaterial amount of stock-based compensation expense was capitalized to inventories attributable to employees who support the manufacturing of the Company's products for the years ended September 30, 2024 and 2023 . The balance sheet as of September 30, 2024 and 2023 includes $1.3 million and $1.2 million, respectively, of stock-based compensation primarily related to implementation of the Company’s lab production software system and order management system, which was capitalized in property and equipment.

The total amount of share-based liabilities settled was $5.9 million for the year ended September 30, 2023. The settlement of the liabilities related to the issuance of contingent consideration and indemnity holdbacks associated with Abveris and iGenomX acquisition.

2018 Employee Stock Purchase Plan

On September 26, 2018, the board of directors adopted the 2018 Employee Stock Purchase Plan (the 2018 ESPP). A total of 275,225 shares of the Company’s common stock have been reserved for issuance under the 2018 ESPP. The number of shares reserved for issuance under the 2018 ESPP will be increased automatically on the first day of each fiscal year, following the fiscal year in which the 2018 ESPP becomes effective, by a number equal to the least of 249,470 shares, 1% of the shares of common stock outstanding at that time, or such number of shares determined by the Company’s board of directors. The number of shares reserved for issuance as at September 30, 2024 is as follows:

(In thousands)	Shares available
Outstanding at September 30, 2023	539
Additional shares authorized	249
Shares issued during the period	(177)
Outstanding at September 30, 2024	611

Subject to any plan limitations, the 2018 ESPP allows eligible service providers (through qualified and non-qualified offerings) to contribute, normally through payroll deductions, up to 15% of their earnings for the purchase of the Company’s common stock at a discounted price per share. The offering periods are beginning in February and August of each year, except the initial offering period which commenced with the initial public offering in October 2018 and ended on August 20, 2019. The common shares issuable under the 2018 ESPP were registered pursuant to a registration statement on Form S-8 on November 26, 2018.

Unless otherwise determined by the board of directors, the Company’s common stock will be purchased for the accounts of employees participating in the 2018 ESPP at a price per share that is the lesser of 85% of the fair market value of the Company’s common stock on the first trading day of the offering period, which for the initial offering period is the price at

which shares of the Company's common stock were first sold to the public, or 85% of the fair market value of the Company's common stock on the last trading day of the offering period. During the years ended September 30, 2024, the Company recorded $1.6 million expense related to the 2018 ESPP. During the years ended September 30, 2023 and 2022 activity under the 2018 ESPP was immaterial.

401(k) Savings Plan

During 2018, the Company adopted a 401(k) savings plan for the benefit of its employees. In January 2022, the Company modified its plan to include an employer matching contribution. The Company is required to make matching contributions to the 401(k) plan equal to 50% of the first 6% of wages deferred by each participating employee. For the year ended September 30, 2024 and 2023, the Company incurred expenses for employer matching contributions of $2.6 million and $2.8 million, respectively.

Abveris Acquisition

On December 1, 2021, the Company completed the acquisition of Abveris and granted certain equity awards to new employees. These equity awards included up to 231,876 restricted shares of the Company's common stock which are issuable based on achievement of the 2023 calendar revenue target, which had an aggregate grant date fair value of $20.1 million. In addition, all employees must remain employed through the payout date, and certain employees have an additional vesting period of up to two years from the acquisition date. The vesting upon achievement of the 2023 calendar revenue target is considered a performance condition, and the effects of that performance condition are not reflected in the grant date fair value of the awards. The Company used the stock price as of December 1, 2021 for the fair value of restricted shares.

At September 30, 2022, management determined that the performance condition relating to these awards was probable of being achieved, and cumulative stock-based compensation expense of $9.9 million was recognized during the year ended September 30, 2022. At December 31, 2022, management determined that the performance condition was not achieved, and therefore the cumulative stock-based compensation expense recognized to date was reversed, resulting in a reduction of stock compensation expense of $9.9 million in the three months ended December 31, 2022.

14. Net loss per share attributable to common stockholders

The following table sets forth the computation of the Company's basic and diluted net loss per share attributable to common stockholders:

	Year ended September 30,		
(in thousands, except per share data)	**2024**	**2023**	**2022**
Numerator:			
Net loss attributable to common stockholders	$ (208,726)	$ (204,618)	$ (217,863)
Denominator:			
Weighted-average shares used in computing net loss per share, basic and diluted	58,016	56,885	53,885
Net loss per share attributable to common stockholders, basic and diluted	$ (3.60)	$ (3.60)	$ (4.04)

The potentially dilutive common shares that were excluded from the calculation of diluted net loss per share because their effect would have been antidilutive for the periods presented are as follows:

	Year ended September 30,		
(in thousands)	**2024**	**2023**	**2022**
Shares subject to options to purchase common stock	1,891	2,408	2,765
Unvested restricted stock units and performance stock units	3,130	2552	2095
Shares subject to employee stock purchase plan	69	118	97
Total	5,090	5,078	4,957

15. Impairment of long-lived assets

On June 30, 2024, the Company identified an impairment indicator with respect to an asset group associated with our antibody discovery services product line ("Biopharma asset group") due to lower than forecasted revenues. Therefore, the Company performed a recoverability test of long-lived assets by comparing the Biopharma asset group's net book value to its future undiscounted net cash flows. The Company concluded that the carrying value of the Biopharma asset group was not recoverable as it exceeded the future undiscounted cash flows the assets are expected to generate from their use and eventual disposition.

To measure the impairment loss, the Company estimated the fair value of the Biopharma asset group by applying a discounted cash flow method. In applying the discounted cash flow method, the Company made certain estimates and assumptions including, among others, the level and timing of revenues, operating expenses, working capital and discount rate. The Company used a discount rate of approximately 14%, which considers the inherent risks associated with the Biopharma asset group.

The allocated impairment loss to any individual long-lived asset within the long-lived asset group cannot reduce the carrying amount of that long-lived asset below its fair value. Accordingly, the Company determined the fair value of the long-lived assets within the Biopharma asset group based on their highest and best use. These assets include intangible assets, property and equipment, and right-of use assets. The Company estimated the fair value of the developed technology intangible asset and the customer relationships intangible asset using an excess earnings model (income approach). The Company estimated the fair value of the trade name intangible asset using a relief from royalty approach. In applying these valuation methods to the intangible assets, the Company made certain estimates and assumptions including the level and timing of expected cash flows and discount rate, which is consistent with the 14% discount rate noted above. The Company determined the fair value of property and equipment based on a market approach. The Company determined the fair value of the lease right-of-use assets by applying a present value technique to the estimated market rate rental cash flows. Assumptions used to determine the fair values of certain lease right-of-use assets included estimated market rent and the discount rate.

These fair value measurements were based on significant inputs not observable in the market and thus represent a Level 3 measurement. The Company believes the level and timing of expected future cash flows appropriately reflects market participant assumptions.

As a result of allocating the impairment, the Company recorded the following impairment charges, which are included in "Impairment of long-lived assets" on our consolidated statements of operations and comprehensive loss for the year ended September 30, 2024:

	Year ended September 30,		
(in thousands)	**2024**	**2023**	**2022**
Property and equipment	$ 9,066	$ 6,785	$ —
Finite-lived intangible assets	35,864	—	—
Total	$ 44,930	$ 6,785	$ —

During the year ended September 30, 2023, the Company recognized impairment of property and equipment. See note 16, *2023 Restructuring and other costs*.

16. 2023 Restructuring and other costs

On May 3, 2023, the Company's Board of Directors approved a strategic restructuring plan to reduce costs, build a leaner organization and increase operating efficiencies. The restructuring plan included a reduction in force which affected approximately 270 employees worldwide, representing approximately 25% of the Company's total workforce. The majority of these employees separated from the Company by September 30, 2023. The reduction in force is subject to local regulatory requirements. Furthermore, as part of the plan the Company removed the duplication of synthetic biology production across its South San Francisco, California and Wilsonville, Oregon facilities. The plan was implemented beginning in May 2023 and was substantially completed by the end of fiscal year 2023.

The Company recognized cumulative pre-tax restructuring $12.7 million and other costs of approximately $3.5 million in the fiscal year ended September 30, 2023, consisting of costs associated with employee severance and related benefits, asset impairments and other associated costs. The Company incurred immaterial employee severance and benefits expenses for year ended September 30, 2024.

Restructuring and other costs and losses on disposal of property and equipment, which was accounted in accordance with ASC 360, Impairment of Long-Lived Assets are presented in the table below:

(in thousands)	Year ended September 30, 2023
Restructuring and other costs:	
Severance and related benefit costs	$ 8,467
Other associated costs [1]	917
	$ 9,384
Impairment of long-lived assets:	
Asset impairments [2]	6,785
	$ 16,169

[1] Related primarily to costs associated with transferring assets between labs and professional service assistance related to the restructuring.
[2] Related to write-off of lab equipment $3.7 million and leasehold improvements for decommissioned labs $1.8 million and computer software $1.3 million.

The following table shows the accrual activity and payments relating to cash-based restructuring costs for the year ended September 30, 2023:

(in thousands)	Severance and related benefit costs	Other associated costs	Total
Costs	$ 8,467	$ 917	$ 9,384
Payments	(7,950)	(917)	(8,867)
Balance as of September 30, 2023	$ 517	$ —	$ 517

As of September 30, 2023, $0.5 million of severance and related benefit costs is included in accrued compensation in the consolidated balance sheets. As of September 30, 2024, no severance and related benefit costs is included in accrued compensation in the consolidated balance sheets.

17. Subsequent Events

On October 21, 2024, the Company executed the Royalty Purchase Agreement ("RPA) with XOMA (US) LLC. ("XOMA Royalty"). Under the RPA, XOMA Royalty provided Twist Bioscience an upfront payment of $15.0 million in cash in exchange for the right to receive half of the future potential milestone and royalty payments resulting from existing antibody discovery and biopharma services agreements between the Company and its customers.

* * * * *

Item 9. ***Changes in and disagreements with accountants on accounting and financial disclosure***

None.

Item 9A. ***Controls and Procedures***

Evaluation of disclosure controls and procedures

Under the supervision and with the participation of our management, including our Chief Executive Officer and Chief Financial Officer, we evaluated the effectiveness of our disclosure controls and procedures (as that term is defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended (the "Exchange Act")) as of September 30, 2024, which is the end of the period covered by this Annual Report. Based on this evaluation, our Chief Executive Officer and Chief Financial Officer concluded that the Company's disclosure controls and procedures were, in design and operation, effective at the reasonable assurance level as of September 30, 2024.

Management's Annual 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 consists of policies and procedures that: (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of our assets; (2) are designed and operated to provide reasonable assurance regarding the reliability of our financial reporting and our process for the preparation of financial statements for external purposes in accordance with generally accepted accounting principles and that our receipts and expenditures are being made only in accordance with authorizations of our management and directors; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of our assets that could have a material effect on the financial statements.
Our management evaluated the effectiveness of our internal control over financial reporting using the criteria set forth in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (the "COSO Framework"). Based on our management's evaluation, our management concluded that our internal control over financial reporting was effective as of September 30, 2024.
The effectiveness of our internal control over financial reporting as of September 30, 2024 has been audited by Ernst & Young LLP, an independent registered public accounting firm, as stated in their report included in Part II, Item 8 of this Annual Report on Form 10-K.

Remediation of Material Weakness

The material weakness previously reported has been remediated as of September 30, 2024. For a more comprehensive discussion of the material weakness existing as of September 30, 2023 and the remedial measures which were being undertaken to address these material weaknesses, or the remediation plan, refer to Part II, Item 9A, "Remediation of Prior Year Material Weakness" of our Annual Report on Form 10-K for fiscal year 2023. Management has since completed implementation of all of the remedial measures outlined in its remediation plan as well as testing of the applicable remediated controls in the last two quarters of fiscal year 2024.

Changes in Internal Control Over Financial Reporting

Except for the changes related to the remediation of the previously identified material weakness noted above, there was no change in our internal control over financial reporting identified in connection with the evaluation required by Rule 13a-15(d) and 15d-15(d) of the Exchange Act that occurred during the most recently completed fiscal quarter that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

Limitations on Effectiveness of Controls and Procedures

Our disclosure controls and procedures are designed to provide reasonable assurance of achieving their objectives, as specified above. Our management recognizes that any control system, no matter how well designed and operated, is based upon certain judgments and assumptions and cannot provide absolute assurance that its objectives will be met.

Report of Independent Registered Public Accounting Firm

To the Stockholders and the Board of Directors of Twist Bioscience Corporation

Opinion on Internal Control Over Financial Reporting

We have audited Twist Bioscience Corporation's internal control over financial reporting as of September 30, 2024, based on criteria established in Internal Control—Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (the COSO criteria). In our opinion, Twist Bioscience Corporation (the Company) maintained, in all material respects, effective internal control over financial reporting as of September 30, 2024, based on the COSO criteria.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets of the Company as of September 30, 2024 and 2023, the related consolidated statements of operations and comprehensive loss, stockholders' equity and cash flows for each of the three years in the period ended September 30, 2024, and the related notes and our report dated November 18, 2024, expressed an unqualified opinion thereon.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting included in the accompanying Management's Annual Report on Internal Control Over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the 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 effective internal control over financial reporting was maintained in all material respects.

Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control Over Financial Reporting

A company's 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 purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. 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.

/s/ Ernst & Young LLP

San Mateo, California
November 18, 2024

Item 9B. ***Other Information***

Rule 10b5-1 Trading Plans

During the three months ended September 30, 2024, none of our directors or officers (as defined in Rule 16a-1(f) under the Exchange Act) adopted or terminated a “Rule 10b5-1 trading arrangement” or “non-Rule 10b5-1 trading arrangement,” as each term is defined in Item 408(a) of Regulation S-K.

Item 9C. ***Disclosure Regarding Foreign Jurisdiction That Prevent Inspections***

Not applicable.

PART III

Item 10. ***Directors, executive officers and corporate governance***

Incorporated by reference from our Definitive Proxy Statement to be filed in connection with the 2025 Annual Meeting of Stockholders.

Code of Ethics

We have adopted the Twist Bioscience Corporation Code of Business Conduct and Ethics, or Code of Ethics, with which every person, including executive officers, who works for Twist and every member of our board of directors is expected to comply. The full text of our Code of Ethics is posted on the investor relations section of our website at www.twistbioscience.com. We intend to satisfy the disclosure requirement under Item 5.05 of Form 8-K regarding amendments and waivers of our Code of Ethics that apply to our principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions by posting that information on our website address specified above.

Item 11. ***Executive compensation***

Incorporated by reference from our Definitive Proxy Statement to be filed in connection with the 2025 Annual Meeting of Stockholders.

Item 12. ***Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters***

Incorporated by reference from our Definitive Proxy Statement to be filed in connection with the 2025 Annual Meeting of Stockholders.

Item 13. ***Certain relationships and related transactions, and director independence***

Incorporated by reference from our Definitive Proxy Statement to be filed in connection with the 2025 Annual Meeting of Stockholders.

Item 14. ***Principal Accounting Fees and Services***

Incorporated by reference from our Definitive Proxy Statement to be filed in connection with the 2025 Annual Meeting of Stockholders.

PART IV

Item 15. *Exhibits, financial statement schedules*

Documents filed as part of this report are as follows:

(a) Consolidated Financial Statements

Our Consolidated Financial Statements are included in the "Index to Consolidated Financial Statements" under Part II, Item 8 and filed as part of this Annual Report on Form 10-K.

(b) Consolidated Financial Statement Schedules

All financial statement schedules are omitted because the information called for is not required or is shown either in the consolidated financial statements or in the notes thereto.

(c) Exhibits

Set forth below is a list of exhibits that are being filed or incorporated by reference into this Annual Report on Form 10-K:

Exhibit Number	Description	Filed / Furnished / Incorporated by Reference from Form	Incorporated by Reference from Exhibit Number	Date Filed
3.1	Amended and Restated Certificate of Incorporation	8-K	3.1	11/7/2018
3.2	Amended and Restated Bylaws	8-K	3.1	11/18/2022
4.1	Form of common stock certificate	S-1/A	4.1	10/17/2018
4.2	Description of Common Stock	10-K	4.5	11/20/2020
+10.1	2013 Stock Plan and forms of agreement thereunder	S-1	10.1	10/3/2018
+10.2	2018 Equity Incentive Plan and forms of agreement thereunder	S-1/A	10.2	10/17/2018
+10.3	2018 Employee Stock Purchase Plan	S-1/A	10.3	10/17/2018
+10.4	Executive Incentive Bonus Plan	S-1	10.4	10/3/2018
+10.5	Form of Indemnification Agreement between Twist Bioscience Corporation and each of its Officers and Directors	S-1/A	10.8	10/17/2018
+10.6	Twist Bioscience Corporation Inducement Equity Incentive Plan and related forms of award agreements thereunder	S-8	99.1	8/25/2023
10.7	Lease Agreement by and between Twist Bioscience Corporation and ARE-San Francisco No. 32. LLC dated March 21, 2018	S-1	10.11	10/3/2018
10.7.1	First Amendment to Lease by and between Twist Bioscience Corporation and ARE-San Francisco No. 32, LLC, dated March 21, 2019	10-Q	10.2	5/1/2019

Exhibit Number	Description	Filed / Furnished / Incorporated by Reference from Form	Incorporated by Reference from Exhibit Number	Date Filed
10.8*	Lease Agreement by and between Twist Bioscience Corporation and PWII Owner, LLC, dated December 18, 2020	8-K	10.1	12/22/2020
10.8.1*	First Amendment to Lease between Twist Bioscience Corporation and PWII Owner, LLC, dated April 13, 2021	8-K	10.1	4/16/2021
10.9†	End User Supply Agreement by and between Twist Bioscience Corporation and FUJIFILM Dimatix, Inc., dated November 5, 2015	S-1	10.14	10/3/2018
10.10	Amended and Restated Employment Agreement dated October 26, 2022 between Twist Bioscience Corporation and Patrick Finn	10-Q	10.1	2/7/2023
10.1	Employment Agreement dated December 18, 2023 between Twist Bioscience Corporation and Adam Laponis	10-Q	10.1	2/2/2024
10.1	Amendment to Employment Agreement dated March 20, 2024 between Twist Bioscience Corporation and James Thorburn	10-Q	10.1	5/2/2024
10.1	Consulting Agreement dated October 8, 2024 by and between Twist Bioscience Corporation and James Thorburn	Filed herewith		
10.14	Amended and Restated Employment Agreement dated September 9, 2022 between Twist Bioscience Corporation and Emily Leproust	Filed herewith		
10.15	Amended and Restated Employment Agreement dated September 9, 2022 between Twist Bioscience Corporation and James Thorburn	Filed herewith		
10.16	Amended and Restated Employment Agreement dated September 9, 2022 between Twist Bioscience Corporation and Paula Green	Filed herewith		
10.17	Amended and Restated Employment Agreement dated September 9, 2022 between Twist Bioscience Corporation and William Banyai	Filed herewith		
10.18	Amended and Restated Employment Agreement dated September 2, 2024 between Twist Bioscience Corporation and Dennis Cho	Filed herewith		

Exhibit Number	Description	Filed / Furnished / Incorporated by Reference from Form	Incorporated by Reference from Exhibit Number	Date Filed
10.19	Employment Agreement dated April 24, 2023 between Twist Bioscience Corporation and Robert Werner	Filed herewith		
19.1	Insider Trading Compliance Program	Filed herewith		
21.1	List of subsidiaries of the Registrant	Filed herewith		
23.1	Consent of Independent Registered Public Accounting Firm	Filed herewith		
31.1	Certification pursuant to Section 302 of the Sarbanes-Oxley Act of 2002, Rule 13(a)-14(a)/15d-14(a), by President and Chief Executive Officer	Filed herewith		
31.2	Certification pursuant to Section 302 of the Sarbanes-Oxley Act of 2002, Rule 13(a)-14(a)/15d-14(a), by Chief Financial Officer	Filed herewith		
32.1	Certification pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, by President and Chief Executive Officer	Furnished herewith		
32.2	Certification pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, by Chief Financial Officer	Furnished herewith		
97.1	Compensation Recovery Policy	Filed herewith		
101.INS	XBRL Instance Document	Filed herewith		
101.SCH	XBRL Taxonomy Extension Schema Document	Filed herewith		
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document	Filed herewith		
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document	Filed herewith		
101.LAB	XBRL Taxonomy Extension Label Linkbase Document	Filed herewith		

Exhibit Number	Description	Filed / Furnished / Incorporated by Reference from Form	Incorporated by Reference from Exhibit Number	Date Filed
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document	Filed herewith		
104	Cover page from the Company's Annual Report on Form 10-K for the year ended September 30, 2024, formatted in Inline XBRL			

+ Indicates a management contract or compensatory plan.

* Registrant has omitted schedules and exhibits pursuant to Item 601(a)(5) of Regulation S-K. Registrant agrees to furnish supplementally a copy of the omitted schedules and exhibits to the SEC upon request.

† Portions of this exhibit (indicated by asterisks) have been omitted pursuant to a request for confidential treatment that was separately filed with the SEC.

Item 16. ***Form of 10-K summary***

Not applicable

SIGNATURES

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

November 18, 2024 Twist Bioscience Corporation

By: /s/ Emily M. Leproust
Emily M. Leproust
Chief Executive Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, as amended, 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/ Emily M. Leproust Emily M. Leproust	Chief Executive Officer and Chair of the Board of Directors (principal executive officer)	November 18, 2024
/s/ Adam Laponis Adam Laponis	Chief Financial Officer (principal financial officer)	November 18, 2024
/s/ Robert F. Werner Robert F. Werner	Chief Accounting Officer (principal accounting officer)	November 18, 2024
/s/ Nelson C. Chan Nelson C. Chan	Director	November 18, 2024
/s/ Robert Chess Robert Chess	Director	November 18, 2024
/s/ Keith Crandell Keith Crandell	Director	November 18, 2024
/s/ Jan Johannessen Jan Johannessen	Director	November 18, 2024
/s/ Xiaoying Mai Xiaoying Mai	Director	November 18, 2024
/s/ Robert Ragusa Robert Ragusa	Director	November 18, 2024
/s/ Melissa Starovasnik Melissa Starovasnik	Director	November 18, 2024

Twist Bioscience Corporation
CONSULTING AGREEMENT

This Consulting Agreement (this "Agreement") is entered into as of October 8, 2024 (the "Effective Date") by and between Twist Bioscience Corporation, a Delaware corporation with a place of business at 681 Gateway Boulevard South San Francisco, California 94080 ("Twist"), and James Thorburn with an address on file ("Consultant"). Consultant and Twist may be referred to herein individually as a "Party" and collectively as the "Parties."

1. **Relationship of Parties.** Consultant's relationship with Twist will be that of an independent contractor and not that of an employee.

2. **Conflicts and Third Parties.** Consultant may, at Consultant's own expense, employ or engage the services of third parties as Consultant deems necessary to perform the Services ("Assistants"). Twist shall have no liability or obligation towards Consultant's Assistants and Consultant shall be wholly responsible for the acts, omission, and professional performance of the Services by the Assistants such that the results are satisfactory to Twist. Consultant shall expressly advise the Assistants of the terms of this Agreement, and shall require each Assistant to be bound by confidentiality obligations at least as restrictive as those set out in Section 8 herein. Consultant represents and warrants that Consultant, Consultant's employees, and/or Assistants have no existing conflicts of interest with Twist that would prevent Consultant from performing the Services for Twist without breaching their confidentiality obligations to Twist or any third party. Consultant will take reasonable steps to ensure that no Assistant develops any conflict of interest during the course of providing Services to Twist if Twist determines that such work conflicts with the terms of this Agreement. Twist reserves the right to terminate this Agreement immediately. In no event shall any of the Services be performed for Twist at the facilities of a third party or using the resources of a third party.

3. **Services.** Consultant will provide services to Twist as described in Exhibit A, attached hereto and incorporated herein by this reference (the "Services"). Consultant represents that Consultant is duly licensed (as applicable) and has the qualifications, the experience and the ability to properly perform the Services. Consultant shall be solely responsible for determining the method, details and means of performing the Services. Consultant shall use Consultant's best efforts to perform the Services such that the results are satisfactory to Twist.

4. **Fees and Expenses.** Twist shall pay to Consultant the amounts specified in Exhibit A. Consultant shall not be authorized to incur any expenses on behalf of Twist and will be responsible for all expenses incurred while performing the Services except as expressly specified in Exhibit A. As a condition to receipt of reimbursement, Consultant shall be required to submit to Twist reasonable evidence that the amount involved was both reasonable and necessary to the Services provided under this Agreement. Consultant shall have full responsibility for applicable withholding taxes for all compensation paid to Consultant or its Assistants under this Agreement, and for compliance with all applicable labor and employment requirements with respect to Consultant's self-employment, sole proprietorship or other form of business organization, and with respect to the Assistants, including state worker's compensation insurance coverage requirements and any U.S. immigration visa requirements.

5. **Intellectual Property.**

5.1. **Work Product**. Consultant is performing Services at Twist's request. All deliverables, assessments, reports, discoveries, inventions, developments, works of authorship, writings, drawings, designs, data specifications, patent applications (and contributions thereto), and any related improvements or modifications to the foregoing, any confidential information or materials of Twist whether or not patentable, which are conceived, created, or otherwise developed by Consultant (alone or with others) pursuant to this Agreement shall be collectively referred to herein as the "Work Product". Twist shall have exclusive ownership, including but not limited to, all U.S. and international copyrights, patents, trademarks, trade secrets, intellectual property rights, and renewal rights relating thereto ("Intellectual Property") in all Work Product, whether partial or completed.

5.2. **Pre-existing Property**. Notwithstanding anything to the contrary in this Agreement, nothing shall limit, restrict, or impair either Party's ownership of, or other rights to, any materials, data, or intellectual property that existed prior to the execution of this Agreement or that was developed or acquired independent of it ("Pre-existing Property"). A Party's Pre-existing Property shall include, without limitation, all records, documents, programming, specifications, diagrams, source code, object code, documentation, and/or Confidential Information that was developed or acquired prior to or independent of this Agreement. Twist shall retain all right, title, and interest in and to Twist's designs, methods, protocols, procedures, algorithms, inventions, software, documents, vectors, plasmids, materials, works of authorship, and other technologies (and any improvements thereto) used or practiced in connection with DNA synthesis, assembly and manufacturing (collectively, "**Twist Manufacturing Technology**"), whether or not developed, created or improved in connection with Twist's performance under this Agreement, and all of Twist's other technology and intellectual property. No rights or licenses in, to or under either Party's intellectual property are granted or provided hereunder, by implication, estoppel or otherwise, except to the extent expressly provided for in this Agreement. Upon written request, a Party shall promptly return to the other all of that other Party's Pre-existing Property to which it has been granted a license under this Agreement. In the event Consultant's Pre-existing Property is embodied in the Work Product, Consultant hereby grants to Twist for use by Twist employees, third party consultants, outsourcers, vendors, and customers, a perpetual, non-exclusive, royalty-free license to use, execute, and perform such Pre-existing Property for all purposes for which Twist does business.

6. **Representations and Warranties.**

6.1. Consultant represents, covenants, and warrants to Twist that the Services performed by Consultant under this Agreement and the resultant Work Product shall not infringe upon any patent, copyright, trademark, trade secret, or other proprietary right of any third party. Consultant further represents, covenants, and warrants to Twist that it will not use or share any trade secrets or confidential or proprietary information owned by any third party in performing Services for Twist without such third party's written consent to the extent permitted by law.

6.2. Consultant represents, covenants, and warrants to Twist that all Services performed pursuant to this Agreement shall be performed in a good and workmanlike manner and in accordance with the highest standards of the industry.

6.3. Consultant represents, covenants, and warrants that it has the right to enter into this Agreement and that company has all necessary right, title, and interest to grant the rights set forth herein to Twist free of any claims, liens, or conflicting rights in favor of any third party.

6.4. Consultant represents, covenants, and warrants that it complies and shall cause its authorized agents and Assistants to comply with all laws concerning performance of Consultant's obligations and duties arising under this Agreement. Consultant further represents, covenants, and warrants that Consultant has policies and procedures in place sufficient to ensure compliance with such laws, and in the case of any authorized agents or subcontractors, that such agents or subcontractors have similarly sufficient policies and procedures.

7. **Non-solicitation.** The Parties agree that until one (1) year following the termination of Consultant's Services for Twist, Consultant shall not interfere with Twist's business by soliciting, attempting to solicit, inducing, or otherwise directly causing (other than a general publicly available solicitation or job ad of the activity of an independent contractor acting without knowledge of the relationship established under this Agreement) any employee of Twist to terminate his or her employment as such, in order to become an employee or consultant to or for Consultant or Consultant's affiliated entities.

8. **Term and Termination.**

8.1. **Term**. This Agreement shall commence on the Effective Date and continue on a month-to-month basis as provided in Exhibit A.

8.2. **Termination for Convenience**. Notwithstanding the above, either party may terminate this Agreement at any time upon 30 days' written notice. In the event of such termination, Consultant shall be paid for any portion of the Services that have been performed prior to the termination.

8.3. **Termination for Cause**. Either party may terminate this Agreement in the event of a material breach by the other party (the "Defaulting Party") of any of its material obligations under this Agreement and failure by the Defaulting Party to cure the breach within 5 days of providing written notice of such breach is provided to the defaulting party.

8.4. **Remedies Upon Default**. In the event of default by either party, the non-defaulting party shall be entitled to exercise any and all rights and remedies as shall be available to it at law or in equity. The non-defaulting party may exercise remedies concurrently or separately, and the exercise of one remedy shall not be deemed an election of such remedy or to preclude the exercise of any other remedy.

8.5. **Survival**. The following sections shall survive any termination of this Agreement: Sections 5-7, 8.4, 8.5, 9, 10, and 11.

9. **Indemnification.** Consultant agrees to indemnify, defend and hold harmless Twist, its officers, directors, employees, agents, consultants, and independent contractors from and against any and all expenses, damages, claims, suits, actions, judgments, liabilities, and costs whatsoever (including attorneys' fees), whether or not litigation is actually commenced (collectively referred to as "Damages"), arising out of or in any way connected with any claim or action made by any third party based on: (1) elements of the work furnished by Consultant, including without limitation intellectual property infringement claims or (2) the acts or omissions of Consultant employees, Assistants, or agents, including, without limitation, damage to real or personal property or personal injury, provided that this obligation shall not extend to Damages caused solely by Twist or its employees, agents, directors, representatives, contractors, or invitees. Consultant shall defend and shall have the right to

control the legal defense of any claim described in this section, including the right to select counsel of its choice, and to compromise or settle any such claim, with the written consent of Twist, which shall not be unreasonably withheld, provided, however that Consultant shall not acquiesce in any judgment or enter into any settlement which admits fault on the part of Twist or creates liability on the part of Twist.

10. **Confidentiality and Non-Disclosure.**

10.1. **Definition of Confidential Information.** "Confidential Information" means information and physical material not generally known or available outside Discloser and information and physical material entrusted to Discloser in confidence by third parties. Confidential Information includes, without limitation: technical data, trade secrets, know-how, research, product or service ideas or plans, software codes and designs, algorithms, developments, inventions, patent applications, laboratory notebooks, processes, formulas, techniques, mask works, engineering designs and drawings, hardware configuration information, regulatory information, medical reports, clinical data and analysis, reagents, cell lines, biological materials, chemical formulas, agreements with third parties, lists of, or information relating to, employees and consultants of the Discloser (including, but not limited to, the names, contact information, jobs, compensation, and expertise of such employees and consultants), lists of, or information relating to, suppliers and customers, price lists, pricing methodologies, cost data, market share data, marketing plans, licenses, contract information, business plans, financial forecasts, historical financial data, budgets or other business information disclosed by Discloser (whether by oral, written, graphic or machine-readable format), which Confidential Information is designated in writing to be confidential or proprietary, or if given orally, is confirmed in writing as having been disclosed as confidential or proprietary within a reasonable time (not to exceed thirty (30) days) after the oral disclosure, or which information would, under the circumstances, appear to a reasonable person to be confidential or proprietary.

10.2. **Nondisclosure of Confidential Information.** Recipient shall not use any Confidential Information disclosed to it by Discloser for its own use or for any purpose other than to carry out discussions concerning, and the undertaking of, the Relationship. Recipient shall not disclose or permit disclosure of any Confidential Information of Discloser to third parties or to employees of Recipient, other than directors, officers, employees, consultants and agents of Recipient who are required to have the information in order to carry out the discussions regarding the Relationship. Recipient shall take reasonable measures to protect the secrecy of and avoid disclosure or use of Confidential Information of Discloser in order to prevent it from falling into the public domain or the possession of persons other than those persons authorized under this Agreement to have any such information. Such measures shall include the degree of care that Recipient utilizes to protect its own Confidential Information of a similar nature. Recipient shall notify Discloser of any misuse, misappropriation or unauthorized disclosure of Confidential Information of Discloser which may come to Recipient's attention.

10.3. **Exceptions.** Notwithstanding the above, Recipient shall not have liability to Discloser with regard to any Confidential Information that the Recipient can prove by written documentation: (a) was in the public domain at the time it was disclosed or has entered the public domain through no fault of Recipient; (b) was known to Recipient, without restriction, at the time of disclosure, as demonstrated by files in existence at the time of disclosure; (c) was independently developed by Recipient without any use of the Confidential Information, as demonstrated by files created at the time of such independent development; (d)is disclosed

generally to third parties by Discloser without restrictions similar to those contained in this Agreement; (e) becomes known to Recipient, without restriction, from a source other than Discloser without breach of this Agreement by Recipient and otherwise not in violation of Discloser's rights; (f) is disclosed with the prior written approval of Discloser; or (g) is disclosed pursuant to the order or requirement of a court, administrative agency, or other governmental body; provided, however, that Recipient shall provide prompt notice of such court order or requirement to Discloser to enable Discloser to seek a protective order or otherwise prevent or restrict such disclosure, pursuant to the terms of Section 10.4 herein.

10.4. **Notice of Compelled Disclosure.** In the event that Recipient or any person to whom they or their representatives transmit or have transmitted Confidential Information become legally compelled (by oral questions, interrogatories, requests for information or documents, subpoenas, civil investigative demands or otherwise) to disclose any such Confidential Information, the Recipient shall provide the Discloser with prompt written notice so that the Discloser may seek a protective order or other appropriate remedy, or both, or waive compliance with the provisions of this Agreement. In the event that the Discloser is unable to obtain a protective order or other appropriate remedy, or if it so directs the Recipient, the Recipient shall furnish only that portion of the Confidential Information that the Recipient is advised by written opinion of its counsel is legally required to be furnished by it and shall exercise its reasonable best efforts to obtain reliable assurance that confidential treatment shall be accorded such Confidential Information.

10.5. **Return of Materials.** Recipient shall, except as otherwise expressly authorized by Discloser, not make any copies or duplicates of any Confidential Information. Any materials or documents that have been furnished by Discloser to Recipient in connection with the Relationship shall be promptly returned by Recipient, accompanied by all copies of such documentation, within ten (10) days after (a) the Relationship has been rejected or concluded or (b) the written request of Discloser.

11. **Release of Employment-related Claims**

11.1. In exchange for the consulting arrangement described herein and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, Consultant agrees as follows:

a) Consultant and his representatives, agents, estate, heirs, successors and assigns, absolutely and unconditionally hereby release, remise, discharge, and hold harmless the Company Releasees ("Company Releasees" defined to include Twist and/or any of its parents, subsidiaries or affiliates, predecessors, successors or assigns, and its and their respective current and/or former partners, directors, shareholders/stockholders, officers, employees, employee benefit plans, insurers, attorneys and/or agents, all both individually and in their official capacities), from any and all legally waivable actions or causes of action, suits, claims, complaints, contracts, liabilities, agreements, promises, torts, debts, damages, controversies, judgments, rights and demands, whether existing or contingent, known or unknown, suspected or unsuspected, which arise out of Consultant's employment with, change in employment status with, and/or separation of employment from, Twist. This release is intended by Consultant to be all-encompassing and to act as a full and total release of any legally waivable claims, whether specifically enumerated herein or not, that Consultant may have or have had against the Company Releasees arising from conduct occurring up to

and through the date Consultant signed this Agreement, including, but not limited to, any legally waivable claims arising from any federal, state or local law, regulation or constitution dealing with either employment, employment benefits or employment discrimination including any claims or causes of action Consultant has or may have relating to discrimination under federal, state or local statutes including, but not limited to, the Age Discrimination in Employment Act of 1967, the Older Workers Benefit Protection Act of 1990, Title VII of the Civil Rights Act of 1964, the Employee Retirement Income Security Act of 1974, the Americans with Disabilities Act, the Family and Medical Leave Act, the California Fair Employment and Housing Act, the Fair Labor Standards Act, the California Labor Code, all as amended from time to time, any contract, whether oral or written, express or implied; any tort; any claim for equity or other benefits, specifically including all unvested equity as of the last day of Consultant's employment with Twist (October 1, 2024); or any other statutory and/or common law claim.

11.2. Consultant acknowledges that his execution of this Agreement shall be effective as a bar to each and every claim specified in Section 11.1(a) of this Agreement. Accordingly, Consultant hereby expressly waives any and all rights and benefits conferred upon him by the provisions of Section 1542 of the California Civil Code (or analogous statute(s) from any other state) and expressly consents that this Agreement shall be given full force and effect with respect to each and all of its express terms and provisions, including those related to unknown and/or unsuspected claims, if any, as well as those relating to any other claims specified in Section 11.1(a) of this Agreement. Section 1542 provides 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."**

Consultant further represents that he understands and acknowledges the significance and consequence of such release as well as the specific waiver of Section 1542.

11.3. The release in this Section of this Agreement does not include any claim which, as a matter of law, cannot be released by private agreement, or relates to indemnification protection under Twist's Articles of Incorporation or Bylaws, pursuant to contract or applicable law. Further, as described in the following Section, this release does not prevent or prohibit Consultant from filing a claim with a federal, state or local government agency that is responsible for enforcing a law on behalf of the government.

11.4. **Government Agency Claims**: Nothing in this Agreement, including the release or the Nondisparagement or Confidentiality provisions herein restricts or prohibits Consultant from initiating communications directly with, responding to any inquiries from, providing testimony before, providing confidential information to, reporting possible violations of law or regulation to, or from filing a claim or assisting with an investigation directly with a self-regulatory authority or a government agency or entity, including the U.S. Equal Employment Opportunity Commission, the Department of Labor, the National Labor Relations Board, the Department of

Justice, the Securities and Exchange Commission, the Congress, the California Department of Fair Employment and Housing, or any other federal, state or local government agency (collectively, the "Regulators"), or from making other disclosures that are protected under the whistleblower provisions of state or federal law or regulation. However, to the maximum extent permitted by law, Consultant is waiving his right to receive any individual monetary relief from Twist or any others covered by the release resulting from such claims or conduct, regardless of whether Consultant or another party has filed them, and in the event Consultant obtains such monetary relief Twist will be entitled to an offset for the payments made pursuant to this Agreement. This Agreement does not limit Consultant's right to receive an award from any Regulator that provides awards for providing information relating to a potential violation of law. Consultant does not need the prior authorization of Twist to engage in conduct protected by this paragraph, and Consultant does not need to notify Twist that he has engaged in such conduct. Please take notice that federal law provides criminal and civil immunity to federal and state claims for trade secret misappropriation to individuals who disclose a trade secret to their attorney, a court, or a government official in certain, confidential circumstances that are set forth at 18 U.S.C. Sections 1833(b)(1) and 1833(b)(2), related to the reporting or investigation of a suspected violation of the law, or in connection with a lawsuit for retaliation for reporting a suspected violation of the law.

11.5. **Waiver of Rights and Claims Under the Age Discrimination in Employment Act of 1967.** As required by federal law, Consultant is being informed that he has or may have specific rights under the Age Discrimination in Employment Act of 1967 ("ADEA") and Consultant agrees that:

a) in consideration for the consulting arrangement described herein, Consultant specifically and voluntarily waives all rights and claims under the ADEA he might have against the Company Releasees to the extent such rights and/or claims arose prior to the date this Agreement was executed;

b) Consultant is advised that he has twenty-one (21) days within which to consider the terms of this Agreement and to consult with or seek advice from an attorney of Consultant's choice or any other person of his choosing prior to executing this Agreement. The twenty-one (21)-day review period will not be affected or extended by any revisions, whether material or immaterial, that might be made to this Agreement;

c) Consultant has carefully read and fully understand all of the provisions of this Agreement, and knowingly and voluntarily agrees to all of the terms set forth in this Agreement;

d) Consultant has seven (7) days after he signs this Agreement to revoke his acceptance of it ("Revocation Period"). If Consultant chooses to revoke it timely, the Agreement will be null and void and the Agreement shall not be valid or enforceable. To revoke, Consultant must deliver a signed writing stating his intention to revoke the Agreement and the writing must be delivered to Paula Green, Senior Vice President of Human Resources, 681 Gateway Blvd., South San Francisco, CA 94080, by or before the end of the Revocation Period; and

e) in entering into this Agreement, Consultant is not relying on any representation, promise or inducement made by Twist or its attorneys with the exception of those promises described in this document.

11.6. **Nondisparagement**: Except as described in Section 11.4, and not including any testimony given truthfully under oath or as required by any other legal proceeding, Consultant agrees not to make disparaging, critical or otherwise detrimental comments to any person or entity concerning Twist, its officers, directors or employees; the products, services or programs provided or to be provided by Twist; the business affairs, operation, management or the financial condition of Twist; or the circumstances surrounding Consultant's employment and/or separation of employment from Twist.

12. **Miscellaneous.**

12.1. **Governing Law.** The validity, interpretation, construction and performance of this Agreement, and all acts and transactions pursuant hereto and the rights and obligations of the parties hereto shall be governed, construed and interpreted in accordance with the laws of the state of California, without giving effect to principles of conflicts of law.

12.2. **Entire Agreement.** This Agreement sets forth the entire agreement and understanding of the parties relating to the subject matter herein and supersedes all prior or contemporaneous discussions, understandings and agreements, whether oral or written, between them relating to the subject matter hereof.

12.3. **Amendments and Waivers.** No modification of or amendment to this Agreement, nor any waiver of any rights under this Agreement, shall be effective unless in writing signed by the parties to this Agreement. No delay or failure to require performance of any provision of this Agreement shall constitute a waiver of that provision as to that or any other instance.

12.4. **Successors and Assigns.** Except as otherwise provided in this Agreement, this Agreement, and the rights and obligations of the parties hereunder, will be binding upon and inure to the benefit of their respective successors, assigns, heirs, executors, administrators and legal representatives. Twist may assign any of its rights and obligations under this Agreement. No other party to this Agreement may assign, whether voluntarily or by operation of law, any of its rights and obligations under this Agreement, except with the prior written consent of Twist.

12.5. **Notices.** Any notice, demand or request required or permitted to be given under this Agreement shall be in writing and shall be deemed sufficient when delivered personally or by overnight courier or sent by email, or 48 hours after being deposited in the U.S. mail as certified or registered mail with postage prepaid, addressed to the party to be notified at such party's address as set forth on the signature page, as subsequently modified by written notice, or if no address is specified on the signature page, at the most recent address set forth in Twist's books and records.

12.6. **Severability.** If one or more provisions of this Agreement are held to be unenforceable under applicable law, the parties agree to renegotiate such provision in good faith. In the event that the parties cannot reach a mutually agreeable and enforceable replacement for such provision, then (i) such provision shall be excluded from this Agreement, (ii) the balance of the

Agreement shall be interpreted as if such provision were so excluded and (iii) the balance of the Agreement shall be enforceable in accordance with its terms.

12.7. **Construction.** This Agreement is the result of negotiations between and has been reviewed by each of the parties hereto and their respective counsel, if any; accordingly, this Agreement shall be deemed to be the product of all of the parties hereto, and no ambiguity shall be construed in favor of or against any one of the parties hereto.

12.8. **Publicity.** Except as otherwise set forth in this Agreement, Customer shall not name or refer to Twist as a supplier of Customer nor use Twist's logos or trade names for publicity, marketing, or any other external communications without Twist's prior written consent.

12.9 Counterparts. This Agreement may be executed in any number of counterparts, each of which when so executed and delivered shall be deemed an original, and all of which together shall constitute one and the same agreement.

IN WITNESS WHEREOF, the Parties have caused their duly authorized representatives to execute this Agreement as of the date(s) set forth below.

TWIST BIOSCIENCE CORPORATION	CONSULTANT
Signature: /s/ Emily Leproust	Signature: /s/ James Thorburn
Name: Emily Leproust, Ph.D., CEO	Name: James Thorburn
Date: 10/8/2024	Date: 10/8/2024

EXHIBIT A
DESCRIPTION OF SERVICES

Background: Consultant and Twist previously made the mutual decision to terminate Consultant's employment as a Strategic Advisor for Twist on October 1, 2024. Twist desires to retain the Consultant's services as an independent contractor after his separation from employment. With these understandings, and in exchange for the promises of the Parties as set forth herein, Consultant and Twist have agreed that Consultant will render the following services as an independent consultant.

Description of Services: Starting on October 8, 2024, for a period of one month, and on a month-to-month basis thereafter, Consultant agrees to provide such assistance as Twist reasonably requests relating to business development, financial, commercial, and strategic matters as assigned by the President & Chief Operating Officer.

Fees: For Services rendered by Consultant under this Agreement, Twist shall pay Consultant at the following rate: $25,000/month, payable 15 days after invoice is received by Twist (accountspayable@twistbioscience.com) - invoice to be submitted by the 5th of the month for last month's services.

Unless otherwise agreed upon in writing Twist, Company's maximum liability for all Services performed during the term of this Agreement shall not exceed $150,000.

September 9, 2022

Emily Leproust

Re: **AMENDED AND RESTATED EMPLOYMENT AGREEMENT**

Dear Emily:

On behalf of Twist Bioscience Corporation, a Delaware corporation (the "Company"), I am pleased to continue your employment with the Company on the terms and conditions set forth in this amended and restated employment agreement (the "Agreement"), effective as of September 9, 2022 (the "Effective Date"). This Agreement amends and restates in its entirety the prior Employment Agreement dated October 21, 2018 by and between you and the Company.

1. Duties and Scope of Employment.

(a) Position. For the term of your employment under this Agreement (your "Employment"), the Company agrees to employ you in the position of Chief Executive Officer. You shall report to the Company's Board of Directors (the "Board") You shall perform the duties and have the responsibilities and authority customarily performed and held by an employee in your position or as otherwise may be assigned or delegated to you by the Company's Board.

(b) Obligations to the Company. During your Employment, you shall devote your full business efforts and time to the Company and shall not assist any person or entity in competing with the Company or in preparing to compete with the Company. During your Employment, without the prior written approval of the Board, you shall not render services in any capacity to any other person or entity and shall not act as a sole proprietor or partner of any other person or entity or own more than five percent (5%) of the stock of any other corporation. Notwithstanding the foregoing, you may serve on corporate, civic or charitable boards or committees, deliver lectures, fulfill speaking engagements, teach at educational institutions, or manage personal investments without such advance written consent, provided that such activities do not individually or in the aggregate interfere with the performance of your duties under this Agreement. You shall comply with the Company's policies and rules, as they may be in effect from time to time during your Employment.

(c) No Conflicting Obligations. You represent and warrant to the Company that you are under no obligations or commitments, whether contractual or otherwise, that are inconsistent with your obligations under this Agreement. In connection with your Employment, you shall not use or disclose any trade secrets or other proprietary information or intellectual property in which you or any other person has any right, title or interest and your Employment shall not infringe or violate the rights of any other

person. You represent and warrant to the Company that you have returned all property and confidential information belonging to any prior employer.

2. Cash Compensation, Employee Benefits, Equity.

(a) Salary. The Company shall continue to pay you as compensation for your services a base salary of $665,000. Such salary shall be payable in accordance with the Company's standard payroll procedures. The annual compensation specified in this subsection (a), together with any modifications in such compensation that the Company may make from time to time, is referred to in this Agreement as "Base Salary." Your Base Salary may be reviewed on an annual basis by the Board or a Compensation Committee of the Board (the "Compensation Committee") based upon available market data.

(b) Incentive Bonus. You shall be eligible to be considered for an annual incentive bonus each fiscal year during the term of your Employment under this Agreement based upon the achievement of certain objective or subjective criteria established by the Board, the Compensation Committee, and/or the senior management of the Company (each, an "Incentive Bonus"). Your eligibility to earn an annual Incentive Bonus and the target amount of such bonus shall be governed by the terms and conditions as determined by the Board, the Compensation Committee and/or the senior management of the Company each calendar year. Commencing with the 2022 fiscal year, the target amount for any such annual Incentive Bonus will be ninety percent (90%) of your Base Salary (the "Target Incentive Bonus Amount"). The determinations of the Board, the Compensation Committee, and/or the senior management of the Company with respect to such bonus shall be final and binding. Any Incentive Bonus for a fiscal year shall be paid no later than the date that is two and one half (2½) months after the close of the calendar year in which such fiscal year ends, but only if you have continued in employment with the Company until September 30 of such applicable fiscal year.

(c) Employee Benefits. During your Employment, you shall be eligible to participate in the employee benefit plans maintained by the Company and generally available to similarly situated employees of the Company, subject in each case to the generally applicable terms and conditions of the plan in question and to the determinations of any person or committee administering such plan.

(d) Equity. Any shares of the Company's Common Stock, options to purchase shares of the Company's Common Stock (each, an "Option") or restricted stock unit awards with respect to Company Common Stock (each, a "RSU Award") that were previously granted or issued to you shall continue to be governed by the terms and conditions of the agreements evidencing the purchase of such Common Stock, the grant of such Option or the grant of such RSU Award, all of which remain in full force and effect, except that any vesting acceleration with respect to such shares, Option or RSU Awards contained in any agreement, including (without limitation) an offer letter or employment agreement or amendment thereto, a stock option agreement, restricted stock purchase agreement or restricted stock unit agreement, shall be nullified and superseded in its entirety by the vesting acceleration set forth below in Section 4 of this Agreement (collectively, the "Equity Documentation").

3. Termination.

(a) **Employment at Will**. Your Employment shall be "at will," meaning that either you or the Company shall be entitled to terminate your Employment at any time and for any reason, with or without notice or Cause, as defined in Section 4 below. Any contrary representations that may have been made to you shall be superseded by this Agreement. This Agreement shall constitute the full and complete agreement between you and the Company on the "at-will" nature of your Employment, which may only be changed in an express written agreement signed by you and a duly authorized member of the Compensation Committee.

(b) **Rights Upon Termination**. Subject to Section 4 below, upon the termination of your Employment, you shall only be entitled to the compensation and benefits earned and the reimbursements described in this Agreement for the period preceding the effective date of the termination.

4. **Severance Pay**.

(a) **General Release**. Any other provision of this Agreement notwithstanding, Subsections 4(b) and 4(c) shall not apply unless you (i) have returned all Company property in your possession, and (ii) have executed a general release of all claims (the "Release") that you may have against the Company or persons affiliated with the Company in a form prescribed by the Company (collectively, the "Conditions"). The Release must be in the form that is reasonably acceptable to you and the Company. The Company shall deliver the Release to you within ten (10) days after your Separation (as defined below). You must satisfy the Conditions within sixty (60) calendar days following your Separation (the "Deadline").

(b) **Severance Pay Not in Connection with Change in Control**. If, other than during the period commencing on a Change in Control (as defined below) and ending on the twenty-four (24) month anniversary of such Change in Control, inclusive, you experience a Separation as a result of (i) your resignation from Employment for Good Reason (as defined below) or (ii) the Company's termination of your Employment for any reason other than (A) Cause (as defined below), (B) death or (C) Disability (as defined below) (the Separation as a result of (i) or (ii) shall be known as an "Involuntary Termination"), then, in addition to the amounts payable in accordance with Section 3(b), the Company shall pay you with the following severance benefits: (i) your Base Salary for a twelve (12) month period (the "Severance Period"); plus (ii) a pro-rata Incentive Bonus in respect of the fiscal year including the date of the Involuntary Termination in an amount equal to (x) the Incentive Bonus calculated based on actual performance for the applicable fiscal year multiplied by (y) a fraction, the numerator of which is the number of days you were employed with the Company during the year and the denominator of which is 365 days, which will be payable to the you at the same time that the Company normally pays its bonuses to other employees (but in no event later than March 15th of the year following the year that includes the Involuntary Termination); plus (iii) the health care premiums for you and your dependents under the Consolidated Omnibus Budget Reconciliation Act ("COBRA") for a period equal in length to the Severance Period, commencing on the first date on which you and your dependents lose health care coverage under the Company's health plans as a result of your Involuntary Termination, provided that you and your dependents are eligible for COBRA with respect to the Company's health plans and timely elect COBRA. The payment of such monthly COBRA premiums will be taxable to the extent required to avoid adverse consequences to you or the Company under either Section 105(h) of the Internal Revenue Code of 1986, as amended (the "Code") or the Patient Protection and Affordable Care Act of 2010. Your Base Salary shall be paid at the rate in effect at the time of your Involuntary Termination (ignoring any reduction

in Base Salary that resulted in a resignation for Good Reason) in accordance with the Company's standard payroll procedures on the Company's payroll dates for a period equal in length to the Severance Period, commencing on the Company's first regular payroll date following the last day of the Deadline, and shall be subject to all applicable withholdings; provided that the first payment shall include all amounts that would have been paid had payment commenced on the first payroll date following your termination of Employment.

(c) **Severance Pay in Connection with Change in Control**. If, during the period commencing on a Change In Control and ending on the twenty-four (24) month anniversary of such Change in Control, you experience an Involuntary Termination, inclusive, then, in lieu of the amounts payable in accordance with Section 3(b), the Company shall instead pay you severance pay equal to (i) your Base Salary for a twenty-four (24) month period (the "CIC Severance Period") plus (ii) an amount equal to times the average of your annual Incentive Bonus paid to you with respect to the two (2) years immediately preceding the year in which your Involuntary Termination occurs plus (iii) a pro-rata Incentive Bonus in respect of the fiscal year including the date of the Involuntary Termination in an amount equal to (x) the Target Incentive Bonus Amount applicable to the year in which your Involuntary Termination occurs multiplied by (y) a fraction, the numerator of which is the number of days you were employed with the Company during the year and the denominator of which is 365 days plus (iv) the health care premiums for you and your dependents under COBRA for a period equal in length to the CIC Severance Period, commencing on the first date on which you and your dependents lose health care coverage under the Company's health plans as a result of your Involuntary Termination, provided that you and your dependents are eligible for COBRA with respect to the Company's health plans and timely elect COBRA plus (v) vesting acceleration with respect to your shares of the Company's Common Stock, Options, RSU Awards and any other equity awards granted to you by the Company that vest based solely upon satisfaction of a time-based vesting schedule (collectively, the "Company Timed-Based Equity"), such that you shall become vested in one hundred percent (100%) of the Company Equity that is unvested and outstanding as of the date of your Involuntary Termination plus (vi) vesting acceleration with respect to any equity awards granted to you by the Company that include a performance-based vesting requirement (the "Company "Performance-Based Equity") such that you shall become vested in the greater of the amount that would become vested based on: (x) achievement at one hundred percent (100%) of target with respect to the Company Performance-Based Equity, or (y) the actual performance with respect to the Company Performance-Based Equity. The payment of such monthly COBRA premiums will be taxable to the extent required to avoid adverse consequences to you or the Company under either Section 105(h) of the Code or the Patient Protection and Affordable Care Act of 2010. Your Base Salary shall be paid at the rate in effect at the time of the termination of your Employment (ignoring any reduction in Base Salary that resulted in a resignation for Good Reason). The severance pay set forth in this Section 4(c), collectively the Base Salary in (i) and the bonuses in (ii) and (iii), shall be aggregated for a total cash severance amount, which shall be paid in substantially equal installments in accordance with the Company's standard payroll procedures on the Company's payroll dates for a period equal in length to the CIC Severance Period, commencing on the Company's first regular payroll date following the last day of the Deadline, and shall be subject to all applicable withholdings; provided that the first payment shall include all amounts that would have been paid had payment commenced on the first payroll date following your termination of Employment. For the avoidance of doubt, upon an Involuntary Termination, you shall be eligible to receive the severance pay and benefits set forth in either Section 4(c) or Section 4(b) above, but not both.

(d) This Section 4, including (without limitation) the severance pay and benefits set forth in Section 4(b) and Section 4(c), shall be in effect for three (3) years from the Effective Date (the "Initial Term Expiration Date"), provided that upon the Initial Term Expiration Date, and each subsequent anniversary of such date, if applicable, the term of your employment under this Agreement will automatically by extended by one (1) year, unless either party hereto provides the other party with written notice as least ninety (90) days before the Initial Term Expiration Date, or such subsequent anniversary of such date, if applicable, of such party's decision not to extend the term of employment under this Agreement any further. Notwithstanding the foregoing, your employment under this Agreement may be terminated at any time before or after the Initial Term Expiration Date, in accordance with Section 3 above.

(e) **Internal Revenue Code Section 409A**. For purposes of Code Section 409A, the regulations and other guidance thereunder and any state law of similar effect (collectively "Section 409A"), each payment that is paid pursuant to this Agreement is hereby designated as a separate payment. The parties intend that all payments made or to be made under this Agreement comply with, or are exempt from, the requirements of Section 409A so that none of the payments or benefits will be subject to the adverse tax penalties imposed under Section 409A, and any ambiguities herein will be interpreted to so comply or be so exempt. Notwithstanding anything stated herein to the contrary, the severance pay provided in connection with your Involuntary Termination under this Section 4 is intended to be exempt from Section 409A pursuant to Treasury Regulation Section 1.409A-1(b)(9)(iii) and to the extent it is exempt pursuant to such section it shall in any event be paid no later than the last day of your second taxable year following the taxable year in which your Involuntary Termination has occurred; provided that, to the extent that such severance and any other payments paid to you in connection with your Involuntary Termination does not qualify or otherwise exceeds the limit set forth in Treasury Regulation Section 1.409A-1(b)(9)(iii)(A) or any similar limit promulgated by the Treasury or the IRS, the portion of the severance pay that does not qualify or otherwise exceeds such limit, as determined by the Company in its sole discretion, shall be paid by no later than the fifteenth (15th) day of the third (3rd) month following the end of your first tax year in which your Involuntary Termination occurs, or, if later, the fifteenth (15th) day of the third (3rd) month following the end of the Company's first tax year in which your Involuntary Termination occurs, as provided in Treasury Regulation Section 1.409A-1(b)(4).

To the extent that any COBRA payment premiums set forth in Section 4(b) or 4(c) above or any other reimbursements or in-kind benefits under this Agreement or otherwise are not exempt from Section 409A, then (i) the benefits provided during any calendar year may not affect the benefits to be provided in any other calendar year; (ii) any payment of COBRA premiums or such other reimbursements or in-kind benefits shall be made on or before the earlier of the last day of the calendar year following the calendar year in which such expense was incurred and the end of the second calendar year following the year of the Involuntary Termination; and (iii) the right to such benefits shall not be subject to liquidation or exchange for another benefit.

Notwithstanding the above, if any of the severance pay provided in connection with your Involuntary Termination does not qualify for any reason to be exempt from Section 409A pursuant to Treasury Regulation Section 1.409A-1(b)(9)(iii) or Treasury Regulation Section 1.409A-1(b)(4) or any other applicable exemption and you are deemed by the Company at the time of your Involuntary Termination to be a "specified employee," as defined in Treasury Regulation Section 1.409A-1(i), each such severance payment shall not be made or commence until the date which is the first (1st) business

day of the seventh (7th) month after your Involuntary Termination and the installments that otherwise would have been paid during the first six (6) months after your Involuntary Termination shall be paid in a lump sum on the first (1st) business day of the seventh (7th) month after your Involuntary Termination, with any remaining severance pay to be paid in accordance with the schedule set forth in Section 4(b) or 4(c) above, as applicable. Such deferral shall only be effected to the extent required to avoid adverse tax treatment to you, including (without limitation) the additional twenty percent (20%) federal tax for which you would otherwise be liable under Section 409A(a)(1)(B) of the Code in the absence of such deferral.

(f) **Definition of "Change in Control"**. "Change in Control" shall have the meaning ascribed to in the Company's 2018 Equity Incentive Plan, as may be amended from time to time (the "Plan") unless otherwise provided for in an Award Agreement (as defined in the Plan).

(g) **Definition of "Cause"**. For all purposes under this Agreement, "Cause" shall mean:

(i) Any material breach by you of this Agreement, the Confidentiality Agreement (as defined below), the Equity Documentation or any other written agreement between you and the Company, which breach to the extent deemed curable by the Board is not cured within ten (10) business days after written notice thereof from the Company;

(ii) Any material failure by you to comply with the Company's written policies or rules, including (without limitation) the Company's ethics or insider trading policies, as they may be in effect from time to time during your Employment, which breach to the extent deemed curable by the Board is not cured within ten (10) business days after written notice thereof from the Company;

(iii) Your repeated failure to follow reasonable and lawful instructions from the Board, which failure is not cured within ten (10) business days after written notice thereof from the Company;

(iv) Commission, conviction of, or a plea of "guilty" or "no contest" to, a felony under the laws of the United States or any State by you if such felony is work-related, impairs your ability to perform services for the Company in accordance with this Agreement, or results in a loss to the Company or damage to the reputation of the Company;

(v) Your misappropriation of funds or property of the Company;

(vi) Gross neglect of your duties;

(vii) Your act or omission that results directly or indirectly in material financial accounting improprieties for the Company;

(viii) Your failure to cooperate with a government investigation; or

(ix) Any gross or willful misconduct by you resulting in a loss to the Company or damage to the reputation of the Company.

(h) **Definition of "Good Reason"**. For all purposes under this Agreement, "Good Reason" shall mean that you resign within ninety (90) days after one of the following conditions has come into existence without your written consent:

(i) A material diminution in your authority, duties or responsibilities;

(ii) A material reduction of your annual Base Salary; provided, however, that prior to a Change in Control, it shall not be Good Reason if there is a corresponding reduction in the base salaries of all other executive officers of the Company;

(iii) A material change in the geographic location at which you must perform services (a change in location of your office will be considered material only if it increases your current one-way commute by more than fifty (50) miles); or.

(iv) A material breach by the Company of a material provision of this Agreement.

A condition shall not be considered "Good Reason" unless you give the Company written notice of the condition within thirty (30) days after the condition comes into existence and the Company fails to remedy the condition within thirty (30) days after receiving your written notice.

(i) **Definition of "Disability"**. For all purposes under this Agreement, "Disability" shall mean that you are unable to perform the essential functions of your position, with or without reasonable accommodation, for a period of at least one hundred twenty (120) consecutive days because of a physical or mental impairment.

(j) **Definition of "Separation"**. For all purposes under this Agreement, "Separation" shall mean an "involuntary separation from service," as defined in the regulations under Section 409A.

5. **Confidentiality Agreement**. The Company's Confidential Information and Invention Assignment Agreement (the "Confidentiality Agreement"), which you previously executed, remains in full force and effect.

6. **Code Section 280G**. In the event that it is determined that any payment or distribution of any type to or for your benefit made by the Company, any of its affiliates, any person who acquires ownership or effective control of the Company or ownership of a substantial portion of the Company's assets (within the meaning of Code Section 280G, as amended, and the regulations thereunder) or any affiliate of such person, whether paid or payable or distributed or distributable pursuant to the terms of this Agreement or otherwise (the "Total Payments"), would be subject to the excise tax imposed by Section 4999 of the Code or any interest or penalties with respect to such excise tax (such excise tax, together with any such interest or penalties, are collectively referred to as the "Excise Tax"), then such payments or distributions shall be payable either in (i) full or (ii) as to such lesser amount which would result in no portion of such payments or distributions being subject to the Excise Tax, whichever method provides you with the greater payments or distributions on an after-tax basis.

All mathematical determinations and all determinations of whether any of the Total Payments are "parachute payments" (within the meaning of section 280G of the Code) that are required to be made under this Section 6, shall be made by the independent professionals retained by the Company (the "Auditors"), who shall provide their determination (the "Determination"), together with detailed supporting calculations regarding the amount of any relevant matters, both to the Company and to you within twenty (20) business days of your termination date, if applicable, or such earlier time as is requested by the Company or you. Any Determination by the Auditors shall be binding upon the Company and you, absent manifest error. The Company shall pay the fees and costs of the Auditors.

Any reduction in payments and/or benefits required by this Section 6 shall be determined by the Company.

7. Miscellaneous Provisions.

(a) Notice. Notices and all other communications contemplated by this Agreement shall be in writing and shall be deemed to have been duly given when personally delivered or when mailed by U.S. registered or certified mail, return receipt requested and postage prepaid, or Federal Express, with delivery charges prepaid. In your case, mailed notices shall be addressed to you at the home address that you most recently communicated to the Company in writing. In the case of the Company, mailed notices shall be addressed to its corporate headquarters, and all notices shall be directed to the attention of its Secretary.

(b) Modifications and Waivers. No provision of this Agreement shall be modified, waived or discharged unless the modification, waiver or discharge is agreed to in writing and signed by you and by an authorized member of the Compensation Committee. No waiver by either party of any breach of, or of compliance with, any condition or provision of this Agreement by the other party shall be considered a waiver of any other condition or provision or of the same condition or provision at another time.

(c) Whole Agreement. No other agreements, representations or understandings (whether oral or written and whether express or implied) which are not expressly set forth in this Agreement have been made or entered into by either party with respect to the subject matter hereof. This Agreement, the Confidentiality Agreement and the Equity Documentation contain the entire understanding of the parties with respect to the subject matter hereof and supersede and replace your previous offer letter or employment agreement with the Company and any amendments thereto.

(d) Withholding Taxes. All payments made under this Agreement shall be subject to reduction to reflect taxes or other charges required to be withheld by law.

(e) Choice of Law and Severability. This Agreement shall be interpreted in accordance with the laws of the State of California without giving effect to provisions governing the choice of law. If any provision of this Agreement becomes or is deemed invalid, illegal or unenforceable in any applicable jurisdiction by reason of the scope, extent or duration of its coverage, then such provision shall be deemed amended to the minimum extent necessary to conform to applicable law so as to be valid and enforceable or, if such provision cannot be so amended without materially altering the intention of the parties, then such provision shall be stricken and the remainder of this Agreement shall continue in full

force and effect. If any provision of this Agreement is rendered illegal by any present or future statute, law, ordinance or regulation (collectively, the "Law") then that provision shall be curtailed or limited only to the minimum extent necessary to bring the provision into compliance with the Law. All the other terms and provisions of this Agreement shall continue in full force and effect without impairment or limitation.

(f) **Assignment; Successors**. The rights and obligations under this Agreement shall be binding upon and inure to the benefits of any successor (whether direct or indirect and whether by purchase, lease, merger, consolidation, liquidation or otherwise) to all or substantially all of the Company's business and/or assets (a "Successor Entity"). For all purposes under this Agreement, the term "Company" shall include any successor to the Company's business or assets that becomes bound by this Agreement. The Company may assign its rights under this Agreement to any Successor Entity without your consent. This Agreement and all of your rights and obligations hereunder are personal to you and may not be transferred or assigned by you at any time. This Agreement and all of your rights hereunder shall inure to the benefit of, and be enforceable by, your personal or legal representatives, executors, administrators, successors, heirs, distributees, devisees and legatees.

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

[Signature Page Follows]

We are all delighted to be able to continue your employment on the terms and conditions set forth in this Agreement. To indicate your acceptance of the Company's offer and continue your employment with the Company, please sign and date this Agreement in the space provided below and return it to me.

Very truly yours,

TWIST BIOSCIENCE CORPORATION

By: /s/ Jame Thorburn
(Signature)

Name: James Thorburn

Title: Chief Financial Officer

ACCEPTED AND AGREED:

/s/ Emily Leproust
Emily Leproust

September 12, 2022
Date

Exhibit 10.15

September 9, 2022

James Thorburn

Re: **AMENDED AND RESTATED EMPLOYMENT AGREEMENT**

Dear James:

On behalf of Twist Bioscience Corporation, a Delaware corporation (the "Company"), I am pleased to continue your employment with the Company on the terms and conditions set forth in this amended and restated employment agreement (the "Agreement"), effective as of September 9, 2022 (the "Effective Date"). This Agreement amends and restates in its entirety the prior Employment Agreement dated October 21, 2018 by and between you and the Company.

1. Duties and Scope of Employment.

(a) Position. For the term of your employment under this Agreement (your "Employment"), the Company agrees to employ you in the position of Chief Financial Officer. You shall report to the Company's Chief Executive Officer. You shall perform the duties and have the responsibilities and authority customarily performed and held by an employee in your position or as otherwise may be assigned or delegated to you by the Company's Board.

(b) Obligations to the Company. During your Employment, you shall devote your full business efforts and time to the Company and shall not assist any person or entity in competing with the Company or in preparing to compete with the Company. During your Employment, without the prior written approval of the Company's Chief Executive Officer (the "CEO"), you shall not render services in any capacity to any other person or entity and shall not act as a sole proprietor or partner of any other person or entity or own more than five percent (5%) of the stock of any other corporation. Notwithstanding the foregoing, you may serve on corporate, civic or charitable boards or committees, deliver lectures, fulfill speaking engagements, teach at educational institutions, or manage personal investments without such advance written consent, provided that such activities do not individually or in the aggregate interfere with the performance of your duties under this Agreement. You shall comply with the Company's policies and rules, as they may be in effect from time to time during your Employment.

(c) No Conflicting Obligations. You represent and warrant to the Company that you are under no obligations or commitments, whether contractual or otherwise, that are inconsistent with your obligations under this Agreement. In connection with your Employment, you shall not use or disclose any trade secrets or other proprietary information or intellectual property in which you or any other person has any right, title or interest and your Employment shall not infringe or violate the rights of any other person. You represent and warrant to the Company that you have returned all property and confidential information belonging to any prior employer.

2. Cash Compensation, Employee Benefits, Equity.

(a) Salary. The Company shall continue to pay you as compensation for your services a base salary of $450,000. Such salary shall be payable in accordance with the Company's standard payroll procedures. The annual compensation specified in this subsection (a), together with any modifications in such compensation that the Company may make from time to time, is referred to in this Agreement as "Base Salary." Your Base Salary may be reviewed on an annual basis by the Board or a Compensation Committee of the Board (the "Compensation Committee") based upon available market data.

(b) Incentive Bonus. You shall be eligible to be considered for an annual incentive bonus each fiscal year during the term of your Employment under this Agreement based upon the achievement of certain objective or subjective criteria established by the Board, the Compensation Committee, and/or the senior management of the Company (each, an "Incentive Bonus"). Your eligibility to earn an annual Incentive Bonus and the target amount of such bonus shall be governed by the terms and conditions as determined by the Board, the Compensation Committee and/or the senior management of the Company each calendar year. Commencing with the 2022 fiscal year, the target amount for any such annual Incentive Bonus will be fifty-five percent (55%) of your Base Salary (the "Target Incentive Bonus Amount"). The determinations of the Board, the Compensation Committee, and/or the senior management of the Company with respect to such bonus shall be final and binding. Any Incentive Bonus for a fiscal year shall be paid no later than the date that is two and one half (2½) months after the close of the calendar year in which such fiscal year ends, but only if you have continued in employment with the Company until September 30 of such applicable fiscal year.

(c) Employee Benefits. During your Employment, you shall be eligible to participate in the employee benefit plans maintained by the Company and generally available to similarly situated employees of the Company, subject in each case to the generally applicable terms and conditions of the plan in question and to the determinations of any person or committee administering such plan.

(d) Equity. Any shares of the Company's Common Stock, options to purchase shares of the Company's Common Stock (each, an "Option") or restricted stock unit awards with respect to Company Common Stock (each, a "RSU Award") that were previously granted or issued to you shall continue to be governed by the terms and conditions of the agreements evidencing the purchase of such Common Stock, the grant of such Option or the grant of such RSU Award, all of which remain in full force and effect, except that any vesting acceleration with respect to such shares, Option or RSU Awards contained in any agreement, including (without limitation) an offer letter or employment agreement or amendment thereto, a stock option agreement, restricted stock purchase agreement or restricted stock unit agreement, shall be nullified and superseded in its entirety by the vesting acceleration set forth below in Section 4 of this Agreement (collectively, the "Equity Documentation").

3. Termination.

(a) Employment at Will. Your Employment shall be "at will," meaning that either you or the Company shall be entitled to terminate your Employment at any time and for any reason, with or without notice or Cause, as defined in Section 4 below. Any contrary representations that may have been made to you shall be superseded by this Agreement. This Agreement shall constitute the full and complete

agreement between you and the Company on the "at-will" nature of your Employment, which may only be changed in an express written agreement signed by you and a duly authorized member of the Compensation Committee.

(b) **Rights Upon Termination**. Subject to Section 4 below, upon the termination of your Employment, you shall only be entitled to the compensation and benefits earned and the reimbursements described in this Agreement for the period preceding the effective date of the termination.

4. **Severance Pay**

(a) **General Release**. Any other provision of this Agreement notwithstanding, Subsections 4(b) and 4(c) shall not apply unless you (i) have returned all Company property in your possession, and (ii) have executed a general release of all claims (the "Release") that you may have against the Company or persons affiliated with the Company in a form prescribed by the Company (collectively, the "Conditions"). The Release must be in the form that is reasonably acceptable to you and the Company. The Company shall deliver the Release to you within ten (10) days after your Separation (as defined below). You must satisfy the Conditions within sixty (60) calendar days following your Separation (the "Deadline").

(b) **Severance Pay Not in Connection with Change in Control**. If, other than during the period commencing on a Change in Control (as defined below) and ending on the twenty-four (24) month anniversary of such Change in Control, inclusive, you experience a Separation as a result of (i) your resignation from Employment for Good Reason (as defined below) or (ii) the Company's termination of your Employment for any reason other than (A) Cause (as defined below), (B) death or (C) Disability (as defined below) (the Separation as a result of (i) or (ii) shall be known as an "Involuntary Termination"), then, in addition to the amounts payable in accordance with Section 3(b), the Company shall pay you with the following severance benefits: (i) your Base Salary for a six (6) month period (the "Severance Period"); plus (ii) a pro-rata Incentive Bonus in respect of the fiscal year including the date of the Involuntary Termination in an amount equal to (x) the Incentive Bonus calculated based on actual performance for the applicable fiscal year multiplied by (y) a fraction, the numerator of which is the number of days you were employed with the Company during the year and the denominator of which is 365 days, which will be payable to the you at the same time that the Company normally pays its bonuses to other employees (but in no event later than March 15th of the year following the year that includes the Involuntary Termination); plus (iii) the health care premiums for you and your dependents under the Consolidated Omnibus Budget Reconciliation Act ("COBRA") for a period equal in length to the Severance Period, commencing on the first date on which you and your dependents lose health care coverage under the Company's health plans as a result of your Involuntary Termination, provided that you and your dependents are eligible for COBRA with respect to the Company's health plans and timely elect COBRA. The payment of such monthly COBRA premiums will be taxable to the extent required to avoid adverse consequences to you or the Company under either Section 105(h) of the Internal Revenue Code of 1986, as amended (the "Code") or the Patient Protection and Affordable Care Act of 2010. Your Base Salary shall be paid at the rate in effect at the time of your Involuntary Termination (ignoring any reduction in Base Salary that resulted in a resignation for Good Reason) in accordance with the Company's standard payroll procedures on the Company's payroll dates for a period equal in length to the Severance Period, commencing on the Company's first regular payroll date following the last day of the Deadline, and shall be subject to all applicable withholdings; provided that the first payment shall include all amounts that would have been paid had payment commenced on the first payroll date following your termination of Employment.

(c) **Severance Pay in Connection with Change in Control**. If, during the period commencing on a Change In Control and ending on the twenty-four (24) month anniversary of such Change in Control, you experience an Involuntary Termination, inclusive, then, in lieu of the amounts payable in accordance with Section 3(b), the Company shall instead pay you severance pay equal to (i) your Base Salary for a twelve (12) month period (the "CIC Severance Period") plus (ii) an amount equal to times the average of your annual Incentive Bonus paid to you with respect to the two (2) years immediately preceding the year in which your Involuntary Termination occurs plus (iii) a pro-rata Incentive

Bonus in respect of the fiscal year including the date of the Involuntary Termination in an amount equal to (x) the Target Incentive Bonus Amount applicable to the year in which your Involuntary Termination occurs multiplied by (y) a fraction, the numerator of which is the number of days you were employed with the Company during the year and the denominator of which is 365 days plus (iv) the health care premiums for you and your dependents under COBRA for a period equal in length to the CIC Severance Period, commencing on the first date on which you and your dependents lose health care coverage under the Company's health plans as a result of your Involuntary Termination, provided that you and your dependents are eligible for COBRA with respect to the Company's health plans and timely elect COBRA plus (v) vesting acceleration with respect to your shares of the Company's Common Stock, Options, RSU Awards and any other equity awards granted to you by the Company that vest based solely upon satisfaction of a time-based vesting schedule (collectively, the "Company Timed-Based Equity"), such that you shall become vested in one hundred percent (100%) of the Company Equity that is unvested and outstanding as of the date of your Involuntary Termination plus (vi) vesting acceleration with respect to any equity awards granted to you by the Company that include a performance-based vesting requirement (the "Company "Performance-Based Equity") such that you shall become vested in the greater of the amount that would become vested based on: (x) achievement at one hundred percent (100%) of target with respect to the Company Performance-Based Equity, or (y) the actual performance with respect to the Company Performance-Based Equity. The payment of such monthly COBRA premiums will be taxable to the extent required to avoid adverse consequences to you or the Company under either Section 105(h) of the Code or the Patient Protection and Affordable Care Act of 2010. Your Base Salary shall be paid at the rate in effect at the time of the termination of your Employment (ignoring any reduction in Base Salary that resulted in a resignation for Good Reason). The severance pay set forth in this Section 4(c), collectively the Base Salary in (i) and the bonuses in (ii) and (iii), shall be aggregated for a total cash severance amount, which shall be paid in substantially equal installments in accordance with the Company's standard payroll procedures on the Company's payroll dates for a period equal in length to the CIC Severance Period, commencing on the Company's first regular payroll date following the last day of the Deadline, and shall be subject to all applicable withholdings; provided that the first payment shall include all amounts that would have been paid had payment commenced on the first payroll date following your termination of Employment. For the avoidance of doubt, upon an Involuntary Termination, you shall be eligible to receive the severance pay and benefits set forth in either Section 4(c) or Section 4(b) above, but not both.

(d) This Section 4, including (without limitation) the severance pay and benefits set forth in Section 4(b) and Section 4(c), shall be in effect for three (3) years from the Effective Date (the "Initial Term Expiration Date"), provided that upon the Initial Term Expiration Date, and each subsequent anniversary of such date, if applicable, the term of your employment under this Agreement will automatically by extended by one (1) year, unless either party hereto provides the other party with written notice as least ninety (90) days before the Initial Term Expiration Date, or such subsequent anniversary of such date, if applicable, of such party's decision not to extend the term of employment under this Agreement any further.

Notwithstanding the foregoing, your employment under this Agreement may be terminated at any time before or after the Initial Term Expiration Date, in accordance with Section 3 above.

(e) **Internal Revenue Code Section 409A**. For purposes of Code Section 409A, the regulations and other guidance thereunder and any state law of similar effect (collectively "Section 409A"), each payment that is paid pursuant to this Agreement is hereby designated as a separate payment. The parties intend that all payments made or to be made under this Agreement comply with, or are exempt from, the requirements of Section 409A so that none of the payments or benefits will be subject to the adverse tax penalties imposed under Section 409A, and any ambiguities herein will be interpreted to so comply or be so exempt. Notwithstanding anything stated herein to the contrary, the severance pay provided in connection with your Involuntary Termination under this Section 4 is intended

to be exempt from Section 409A pursuant to Treasury Regulation Section 1.409A-1(b)(9)(iii) and to the extent it is exempt pursuant to such section it shall in any event be paid no later than the last day of your second taxable year following the taxable year in which your Involuntary Termination has occurred; provided that, to the extent that such severance and any other payments paid to you in connection with your Involuntary Termination does not qualify or otherwise exceeds the limit set forth in Treasury Regulation Section 1.409A-1(b)(9)(iii)(A) or any similar limit promulgated by the Treasury or the IRS, the portion of the severance pay that does not qualify or otherwise exceeds such limit, as determined by the Company in its sole discretion, shall be paid by no later than the fifteenth (15th) day of the third (3rd) month following the end of your first tax year in which your Involuntary Termination occurs, or, if later, the fifteenth (15th) day of the third (3rd) month following the end of the Company's first tax year in which your Involuntary Termination occurs, as provided in Treasury Regulation Section 1.409A-1(b)(4).

To the extent that any COBRA payment premiums set forth in Section 4(b) or 4(c) above or any other reimbursements or in-kind benefits under this Agreement or otherwise are not exempt from Section 409A, then (i) the benefits provided during any calendar year may not affect the benefits to be provided in any other calendar year; (ii) any payment of COBRA premiums or such other reimbursements or in-kind benefits shall be made on or before the earlier of the last day of the calendar year following the calendar year in which such expense was incurred and the end of the second calendar year following the year of the Involuntary Termination; and (iii) the right to such benefits shall not be subject to liquidation or exchange for another benefit.

Notwithstanding the above, if any of the severance pay provided in connection with your Involuntary Termination does not qualify for any reason to be exempt from Section 409A pursuant to Treasury Regulation Section 1.409A-1(b)(9)(iii) or Treasury Regulation Section 1.409A-1(b)(4) or any other applicable exemption and you are deemed by the Company at the time of your Involuntary Termination to be a "specified employee," as defined in Treasury Regulation Section 1.409A-1(i), each such severance payment shall not be made or commence until the date which is the first (1st) business day of the seventh (7th) month after your Involuntary Termination and the installments that otherwise would have been paid during the first six (6) months after your Involuntary Termination shall be paid in a lump sum on the first (1st) business day of the seventh (7th) month after your Involuntary Termination, with any remaining severance pay to be paid in accordance with the schedule set forth in Section 4(b) or 4(c) above, as applicable. Such deferral shall only be effected to the extent required to avoid adverse tax treatment to you, including (without limitation) the additional twenty percent (20%) federal tax for which you would otherwise be liable under Section 409A(a)(1)(B) of the Code in the absence of such deferral.

(f) **Definition of "Change in Control**". "Change in Control" shall have the meaning ascribed to in the Company's 2018 Equity Incentive Plan, as may be amended from time to time (the "Plan") unless otherwise provided for in an Award Agreement (as defined in the Plan).

(g) **Definition of "Cause**". For all purposes under this Agreement, "Cause" shall mean:

(i) Any material breach by you of this Agreement, the Confidentiality Agreement (as defined below), the Equity Documentation or any other written agreement between you and the Company, which breach to the extent deemed curable by the Board is not cured within ten (10) business days after written notice thereof from the Company;

(ii) Any material failure by you to comply with the Company's written policies or rules, including (without limitation) the Company's ethics or insider trading policies, as they may be in effect from time to time during your Employment, which breach to the extent deemed curable by the Board is not cured within ten (10) business days after written notice thereof from the Company;

(iii) Your repeated failure to follow reasonable and lawful instructions from the Board, which failure is not cured within ten (10) business days after written notice thereof from the Company;

(iv) Commission, conviction of, or a plea of "guilty" or "no contest" to, a felony under the laws of the United States or any State by you if such felony is work-related, impairs your ability to perform services for the Company in accordance with this Agreement, or results in a loss to the Company or damage to the reputation of the Company;

(v) Your misappropriation of funds or property of the Company;

(vi) Gross neglect of your duties;

(vii) Your act or omission that results directly or indirectly in material financial accounting improprieties for the Company;

(viii) Your failure to cooperate with a government investigation; or

(ix) Any gross or willful misconduct by you resulting in a loss to the Company or damage to the reputation of the Company.

(h) **Definition of "Good Reason**". For all purposes under this Agreement, "Good Reason" shall mean that you resign within ninety (90) days after one of the following conditions has come into existence without your written consent:

(i) A material diminution in your authority, duties or responsibilities;

(ii) A material reduction of your annual Base Salary; provided, however, that prior to a Change in Control, it shall not be Good Reason if there is a corresponding reduction in the base salaries of all other executive officers of the Company;

(iii) A material change in the geographic location at which you must perform services (a change in location of your office will be considered material only if it increases your current one-way commute by more than fifty (50) miles); or.

(iv) A material breach by the Company of a material provision of this Agreement.

A condition shall not be considered "Good Reason" unless you give the Company written notice of the condition within thirty (30) days after the condition comes into existence and the Company fails to remedy the condition within thirty (30) days after receiving your written notice.

(v) **Definition of "Disability**". For all purposes under this Agreement, "Disability" shall mean that you are unable to perform the essential functions of your position, with or without reasonable accommodation, for a period of at least one hundred twenty (120) consecutive days because of a physical or mental impairment.

(i) **Definition of "Separation**". For all purposes under this Agreement, "Separation" shall mean an "involuntary separation from service," as defined in the regulations under Section 409A.

5. Confidentiality Agreement. The Company's Confidential Information and Invention Assignment Agreement (the "Confidentiality Agreement"), which you previously executed, remains in full force and effect.

6. Code Section 280G. In the event that it is determined that any payment or distribution of any type to or for your benefit made by the Company, any of its affiliates, any person who acquires ownership or effective control of the Company or ownership of a substantial portion of the Company's assets (within the meaning of Code Section 280G, as amended, and the regulations thereunder) or any affiliate of such person, whether paid or payable or distributed or distributable pursuant to the terms of this Agreement or otherwise (the "Total Payments"), would be subject to the excise tax imposed by Section 4999 of the Code or any interest or penalties with respect to such excise tax (such excise tax, together with any such interest or penalties, are collectively referred to as the "Excise Tax"), then such payments or distributions shall be payable either in (i) full or (ii) as to such lesser amount which would result in no portion of such payments or distributions being subject to the Excise Tax, whichever method provides you with the greater payments or distributions on an after-tax basis.

All mathematical determinations and all determinations of whether any of the Total Payments are "parachute payments" (within the meaning of section 280G of the Code) that are required to be made under this Section 6, shall be made by the independent professionals retained by the Company (the "Auditors"), who shall provide their determination (the "Determination"), together with detailed supporting calculations regarding the amount of any relevant matters, both to the Company and to you within twenty (20) business days of your termination date, if applicable, or such earlier time as is requested by the Company or you. Any Determination by the Auditors shall be binding upon the Company and you, absent manifest error. The Company shall pay the fees and costs of the Auditors.

Any reduction in payments and/or benefits required by this Section 6 shall be determined by the Company.

7. Miscellaneous Provisions.

(a) Notice. Notices and all other communications contemplated by this Agreement shall be in writing and shall be deemed to have been duly given when personally delivered or when mailed by U.S. registered or certified mail, return receipt requested and postage prepaid, or Federal Express, with delivery charges prepaid. In your case, mailed notices shall be addressed to you at the home address that you most recently communicated to the Company in writing. In the case of the Company, mailed notices shall be addressed to its corporate headquarters, and all notices shall be directed to the attention of its Secretary.

(b) Modifications and Waivers. No provision of this Agreement shall be modified, waived or discharged unless the modification, waiver or discharge is agreed to in writing and signed by you and by an authorized member of the Compensation Committee. No waiver by either party of any breach of, or of compliance with, any condition or provision of this Agreement by the other party shall be considered a waiver of any other condition or provision or of the same condition or provision at another time.

(c) Whole Agreement. No other agreements, representations or understandings (whether oral or written and whether express or implied) which are not expressly set forth in this Agreement have been made or entered into by either party with respect to the subject matter hereof. This Agreement, the Confidentiality Agreement and the Equity Documentation contain the entire understanding of the parties with respect to the subject matter hereof and supersede and replace your previous offer letter or employment agreement with the Company and any amendments thereto.

(d) **Withholding Taxes**. All payments made under this Agreement shall be subject to reduction to reflect taxes or other charges required to be withheld by law.

(e) **Choice of Law and Severability**. This Agreement shall be interpreted in accordance with the laws of the State of California without giving effect to provisions governing the choice of law. If any provision of this Agreement becomes or is deemed invalid, illegal or unenforceable in any applicable jurisdiction by reason of the scope, extent or duration of its coverage, then such provision shall be deemed amended to the minimum extent necessary to conform to applicable law so as to be valid and enforceable or, if such provision cannot be so amended without materially altering the intention of the parties, then such provision shall be stricken and the remainder of this Agreement shall continue in full force and effect. If any provision of this Agreement is rendered illegal by any present or future statute, law, ordinance or regulation (collectively, the "Law") then that provision shall be curtailed or limited only to the minimum extent necessary to bring the provision into compliance with the Law. All the other terms and provisions of this Agreement shall continue in full force and effect without impairment or limitation.

(f) **Assignment; Successors**. The rights and obligations under this Agreement shall be binding upon and inure to the benefits of any successor (whether direct or indirect and whether by purchase, lease, merger, consolidation, liquidation or otherwise) to all or substantially all of the Company's business and/or assets (a "Successor Entity"). For all purposes under this Agreement, the term "Company" shall include any successor to the Company's business or assets that becomes bound by this Agreement. The Company may assign its rights under this Agreement to any Successor Entity without your consent. This Agreement and all of your rights and obligations hereunder are personal to you and may not be transferred or assigned by you at any time. This Agreement and all of your rights hereunder shall inure to the benefit of, and be enforceable by, your personal or legal representatives, executors, administrators, successors, heirs, distributees, devisees and legatees.

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

[Signature Page Follows]

We are all delighted to be able to continue your employment on the terms and conditions set forth in this Agreement. To indicate your acceptance of the Company's offer and continue your employment with the Company, please sign and date this Agreement in the space provided below and return it to me.

Very truly yours,

TWIST BIOSCIENCE CORPORATION

By: /s/ Emily Leproust (Signature)

Name: Emily Leproust

Title: CEO

ACCEPTED AND AGREED:

/s/ Jame Thorburn
James Thorburn

10/5/2022
Date

Exhibit 10.16

September 9, 2022

Paula Green

Re: **AMENDED AND RESTATED EMPLOYMENT AGREEMENT**

Dear Paula:

On behalf of Twist Bioscience Corporation, a Delaware corporation (the "Company"), I am pleased to continue your employment with the Company on the terms and conditions set forth in this amended and restated employment agreement (the "Agreement"), effective as of September 9, 2022 (the "Effective Date"). This Agreement amends and restates in its entirety the prior Employment Agreement dated December 22, 2018 by and between you and the Company.

1. Duties and Scope of Employment.

(a) Position. For the term of your employment under this Agreement (your "Employment"), the Company agrees to employ you in the position of Senior Vice President of Human Resources. You shall report to the Company's Chief Executive Officer. You shall perform the duties and have the responsibilities and authority customarily performed and held by an employee in your position or as otherwise may be assigned or delegated to you by the Company's Board.

(b) Obligations to the Company. During your Employment, you shall devote your full business efforts and time to the Company and shall not assist any person or entity in competing with the Company or in preparing to compete with the Company. During your Employment, without the prior written approval of the Company's Chief Executive Officer (the "CEO"), you shall not render services in any capacity to any other person or entity and shall not act as a sole proprietor or partner of any other person or entity or own more than five percent (5%) of the stock of any other corporation. Notwithstanding the foregoing, you may serve on corporate, civic or charitable boards or committees, deliver lectures, fulfill speaking engagements, teach at educational institutions, or manage personal investments without such advance written consent, provided that such activities do not individually or in the aggregate interfere with the performance of your duties under this Agreement. You shall comply with the Company's policies and rules, as they may be in effect from time to time during your Employment.

(c) No Conflicting Obligations. You represent and warrant to the Company that you are under no obligations or commitments, whether contractual or otherwise, that are inconsistent with your obligations under this Agreement. In connection with your Employment, you shall not use or disclose any trade secrets or other proprietary information or intellectual property in which you or any other person has any right, title or interest and your Employment shall not infringe or violate the rights of any other

person. You represent and warrant to the Company that you have returned all property and confidential information belonging to any prior employer.

2. Cash Compensation, Employee Benefits, Equity.

(a) Salary. The Company shall continue to pay you as compensation for your services a base salary of $335,000. Such salary shall be payable in accordance with the Company's standard payroll procedures. The annual compensation specified in this subsection (a), together with any modifications in such compensation that the Company may make from time to time, is referred to in this Agreement as "Base Salary." Your Base Salary may be reviewed on an annual basis by the Board or a Compensation Committee of the Board (the "Compensation Committee") based upon available market data.

(b) Incentive Bonus. You shall be eligible to be considered for an annual incentive bonus each fiscal year during the term of your Employment under this Agreement based upon the achievement of certain objective or subjective criteria established by the Board, the Compensation Committee, and/or the senior management of the Company (each, an "Incentive Bonus"). Your eligibility to earn an annual Incentive Bonus and the target amount of such bonus shall be governed by the terms and conditions as determined by the Board, the Compensation Committee and/or the senior management of the Company each calendar year. Commencing with the 2022 fiscal year, the target amount for any such annual Incentive Bonus will be fifty percent (50%) of your Base Salary (the "Target Incentive Bonus Amount"). The determinations of the Board, the Compensation Committee, and/or the senior management of the Company with respect to such bonus shall be final and binding. Any Incentive Bonus for a fiscal year shall be paid no later than the date that is two and one half (2½) months after the close of the calendar year in which such fiscal year ends, but only if you have continued in employment with the Company until September 30 of such applicable fiscal year.

(c) Employee Benefits. During your Employment, you shall be eligible to participate in the employee benefit plans maintained by the Company and generally available to similarly situated employees of the Company, subject in each case to the generally applicable terms and conditions of the plan in question and to the determinations of any person or committee administering such plan.

(d) Equity. Any shares of the Company's Common Stock, options to purchase shares of the Company's Common Stock (each, an "Option") or restricted stock unit awards with respect to Company Common Stock (each, a "RSU Award") that were previously granted or issued to you shall continue to be governed by the terms and conditions of the agreements evidencing the purchase of such Common Stock, the grant of such Option or the grant of such RSU Award, all of which remain in full force and effect, except that any vesting acceleration with respect to such shares, Option or RSU Awards contained in any agreement, including (without limitation) an offer letter or employment agreement or amendment thereto, a stock option agreement, restricted stock purchase agreement or restricted stock unit agreement, shall be nullified and superseded in its entirety by the vesting acceleration set forth below in Section 4 of this Agreement (collectively, the "Equity Documentation").

3. Termination.

(a) **Employment at Will**. Your Employment shall be "at will," meaning that either you or the Company shall be entitled to terminate your Employment at any time and for any reason, with or without notice or Cause, as defined in Section 4 below. Any contrary representations that may have been made to you shall be superseded by this Agreement. This Agreement shall constitute the full and complete agreement between you and the Company on the "at-will" nature of your Employment, which may only be changed in an express written agreement signed by you and a duly authorized member of the Compensation Committee.

(b) **Rights Upon Termination**. Subject to Section 4 below, upon the termination of your Employment, you shall only be entitled to the compensation and benefits earned and the reimbursements described in this Agreement for the period preceding the effective date of the termination.

4. **Severance Pay**.

(a) **General Release**. Any other provision of this Agreement notwithstanding, Subsections 4(b) and 4(c) shall not apply unless you (i) have returned all Company property in your possession, and (ii) have executed a general release of all claims (the "Release") that you may have against the Company or persons affiliated with the Company in a form prescribed by the Company (collectively, the "Conditions"). The Release must be in the form that is reasonably acceptable to you and the Company. The Company shall deliver the Release to you within ten (10) days after your Separation (as defined below). You must satisfy the Conditions within sixty (60) calendar days following your Separation (the "Deadline").

(b) **Severance Pay Not in Connection with Change in Control**. If, other than during the period commencing on a Change in Control (as defined below) and ending on the twenty-four (24) month anniversary of such Change in Control, inclusive, you experience a Separation as a result of (i) your resignation from Employment for Good Reason (as defined below) or (ii) the Company's termination of your Employment for any reason other than (A) Cause (as defined below), (B) death or (C) Disability (as defined below) (the Separation as a result of (i) or (ii) shall be known as an "Involuntary Termination"), then, in addition to the amounts payable in accordance with Section 3(b), the Company shall pay you with the following severance benefits: (i) your Base Salary for a six (6) month period (the "Severance Period"); plus (ii) a pro-rata Incentive Bonus in respect of the fiscal year including the date of the Involuntary Termination in an amount equal to (x) the Incentive Bonus calculated based on actual performance for the applicable fiscal year multiplied by (y) a fraction, the numerator of which is the number of days you were employed with the Company during the year and the denominator of which is 365 days, which will be payable to the you at the same time that the Company normally pays its bonuses to other employees (but in no event later than March 15th of the year following the year that includes the Involuntary Termination); plus (iii) the health care premiums for you and your dependents under the Consolidated Omnibus Budget Reconciliation Act ("COBRA") for a period equal in length to the Severance Period, commencing on the first date on which you and your dependents lose health care coverage under the Company's health plans as a result of your Involuntary Termination, provided that you and your dependents are eligible for COBRA with respect to the Company's health plans and timely elect COBRA. The payment of such monthly COBRA premiums will be taxable to the extent required to avoid adverse consequences to you or the Company under either Section 105(h) of the Internal Revenue Code of 1986, as amended (the "Code") or the Patient Protection and Affordable Care Act of 2010. Your Base Salary shall be paid at the rate in effect at the time of your Involuntary Termination (ignoring any reduction

in Base Salary that resulted in a resignation for Good Reason) in accordance with the Company's standard payroll procedures on the Company's payroll dates for a period equal in length to the Severance Period, commencing on the Company's first regular payroll date following the last day of the Deadline, and shall be subject to all applicable withholdings; provided that the first payment shall include all amounts that would have been paid had payment commenced on the first payroll date following your termination of Employment.

(c) **Severance Pay in Connection with Change in Control**. If, during the period commencing on a Change In Control and ending on the twenty-four (24) month anniversary of such Change in Control, you experience an Involuntary Termination, inclusive, then, in lieu of the amounts payable in accordance with Section 3(b), the Company shall instead pay you severance pay equal to (i) your Base Salary for a twelve (12) month period (the "CIC Severance Period") plus (ii) an amount equal to times the average of your annual Incentive Bonus paid to you with respect to the two (2) years immediately preceding the year in which your Involuntary Termination occurs plus (iii) a pro-rata Incentive Bonus in respect of the fiscal year including the date of the Involuntary Termination in an amount equal to (x) the Target Incentive Bonus Amount applicable to the year in which your Involuntary Termination occurs multiplied by (y) a fraction, the numerator of which is the number of days you were employed with the Company during the year and the denominator of which is 365 days plus (iv) the health care premiums for you and your dependents under COBRA for a period equal in length to the CIC Severance Period, commencing on the first date on which you and your dependents lose health care coverage under the Company's health plans as a result of your Involuntary Termination, provided that you and your dependents are eligible for COBRA with respect to the Company's health plans and timely elect COBRA plus (v) vesting acceleration with respect to your shares of the Company's Common Stock, Options, RSU Awards and any other equity awards granted to you by the Company that vest based solely upon satisfaction of a time-based vesting schedule (collectively, the "Company Timed-Based Equity"), such that you shall become vested in one hundred percent (100%) of the Company Equity that is unvested and outstanding as of the date of your Involuntary Termination plus (vi) vesting acceleration with respect to any equity awards granted to you by the Company that include a performance-based vesting requirement (the "Company "Performance-Based Equity") such that you shall become vested in the greater of the amount that would become vested based on: (x) achievement at one hundred percent (100%) of target with respect to the Company Performance-Based Equity, or (y) the actual performance with respect to the Company Performance-Based Equity. The payment of such monthly COBRA premiums will be taxable to the extent required to avoid adverse consequences to you or the Company under either Section 105(h) of the Code or the Patient Protection and Affordable Care Act of 2010. Your Base Salary shall be paid at the rate in effect at the time of the termination of your Employment (ignoring any reduction in Base Salary that resulted in a resignation for Good Reason). The severance pay set forth in this Section 4(c), collectively the Base Salary in (i) and the bonuses in (ii) and (iii), shall be aggregated for a total cash severance amount, which shall be paid in substantially equal installments in accordance with the Company's standard payroll procedures on the Company's payroll dates for a period equal in length to the CIC Severance Period, commencing on the Company's first regular payroll date following the last day of the Deadline, and shall be subject to all applicable withholdings; provided that the first payment shall include all amounts that would have been paid had payment commenced on the first payroll date following your termination of Employment. For the avoidance of doubt, upon an Involuntary Termination, you shall be eligible to receive the severance pay and benefits set forth in either Section 4(c) or Section 4(b) above, but not both.

(d) This Section 4, including (without limitation) the severance pay and benefits set forth in Section 4(b) and Section 4(c), shall be in effect for three (3) years from the Effective Date (the "Initial Term Expiration Date"), provided that upon the Initial Term Expiration Date, and each subsequent anniversary of such date, if applicable, the term of your employment under this Agreement will automatically by extended by one (1) year, unless either party hereto provides the other party with written notice as least ninety (90) days before the Initial Term Expiration Date, or such subsequent anniversary of such date, if applicable, of such party's decision not to extend the term of employment under this Agreement any further. Notwithstanding the foregoing, your employment under this Agreement may be terminated at any time before or after the Initial Term Expiration Date, in accordance with Section 3 above.

(e) **Internal Revenue Code Section 409A**. For purposes of Code Section 409A, the regulations and other guidance thereunder and any state law of similar effect (collectively "Section 409A"), each payment that is paid pursuant to this Agreement is hereby designated as a separate payment. The parties intend that all payments made or to be made under this Agreement comply with, or are exempt from, the requirements of Section 409A so that none of the payments or benefits will be subject to the adverse tax penalties imposed under Section 409A, and any ambiguities herein will be interpreted to so comply or be so exempt. Notwithstanding anything stated herein to the contrary, the severance pay provided in connection with your Involuntary Termination under this Section 4 is intended to be exempt from Section 409A pursuant to Treasury Regulation Section 1.409A-1(b)(9)(iii) and to the extent it is exempt pursuant to such section it shall in any event be paid no later than the last day of your second taxable year following the taxable year in which your Involuntary Termination has occurred; provided that, to the extent that such severance and any other payments paid to you in connection with your Involuntary Termination does not qualify or otherwise exceeds the limit set forth in Treasury Regulation Section 1.409A-1(b)(9)(iii)(A) or any similar limit promulgated by the Treasury or the IRS, the portion of the severance pay that does not qualify or otherwise exceeds such limit, as determined by the Company in its sole discretion, shall be paid by no later than the fifteenth (15th) day of the third (3rd) month following the end of your first tax year in which your Involuntary Termination occurs, or, if later, the fifteenth (15th) day of the third (3rd) month following the end of the Company's first tax year in which your Involuntary Termination occurs, as provided in Treasury Regulation Section 1.409A-1(b)(4).

To the extent that any COBRA payment premiums set forth in Section 4(b) or 4(c) above or any other reimbursements or in-kind benefits under this Agreement or otherwise are not exempt from Section 409A, then (i) the benefits provided during any calendar year may not affect the benefits to be provided in any other calendar year; (ii) any payment of COBRA premiums or such other reimbursements or in-kind benefits shall be made on or before the earlier of the last day of the calendar year following the calendar year in which such expense was incurred and the end of the second calendar year following the year of the Involuntary Termination; and (iii) the right to such benefits shall not be subject to liquidation or exchange for another benefit.

Notwithstanding the above, if any of the severance pay provided in connection with your Involuntary Termination does not qualify for any reason to be exempt from Section 409A pursuant to Treasury Regulation Section 1.409A-1(b)(9)(iii) or Treasury Regulation Section 1.409A-1(b)(4) or any other applicable exemption and you are deemed by the Company at the time of your Involuntary Termination to be a "specified employee," as defined in Treasury Regulation Section 1.409A-1(i), each such severance payment shall not be made or commence until the date which is the first (1st) business

day of the seventh (7th) month after your Involuntary Termination and the installments that otherwise would have been paid during the first six (6) months after your Involuntary Termination shall be paid in a lump sum on the first (1st) business day of the seventh (7th) month after your Involuntary Termination, with any remaining severance pay to be paid in accordance with the schedule set forth in Section 4(b) or 4(c) above, as applicable. Such deferral shall only be effected to the extent required to avoid adverse tax treatment to you, including (without limitation) the additional twenty percent (20%) federal tax for which you would otherwise be liable under Section 409A(a)(1)(B) of the Code in the absence of such deferral.

(f) **Definition of "Change in Control"**. "Change in Control" shall have the meaning ascribed to in the Company's 2018 Equity Incentive Plan, as may be amended from time to time (the "Plan") unless otherwise provided for in an Award Agreement (as defined in the Plan).

(g) **Definition of "Cause"**. For all purposes under this Agreement, "Cause" shall mean:

(i) Any material breach by you of this Agreement, the Confidentiality Agreement (as defined below), the Equity Documentation or any other written agreement between you and the Company, which breach to the extent deemed curable by the Board is not cured within ten (10) business days after written notice thereof from the Company;

(ii) Any material failure by you to comply with the Company's written policies or rules, including (without limitation) the Company's ethics or insider trading policies, as they may be in effect from time to time during your Employment, which breach to the extent deemed curable by the Board is not cured within ten (10) business days after written notice thereof from the Company;

(iii) Your repeated failure to follow reasonable and lawful instructions from the Board, which failure is not cured within ten (10) business days after written notice thereof from the Company;

(iv) Commission, conviction of, or a plea of "guilty" or "no contest" to, a felony under the laws of the United States or any State by you if such felony is work-related, impairs your ability to perform services for the Company in accordance with this Agreement, or results in a loss to the Company or damage to the reputation of the Company;

(v) Your misappropriation of funds or property of the Company;

(vi) Gross neglect of your duties;

(vii) Your act or omission that results directly or indirectly in material financial accounting improprieties for the Company;

(viii) Your failure to cooperate with a government investigation; or

(ix) Any gross or willful misconduct by you resulting in a loss to the Company or damage to the reputation of the Company.

(h) **Definition of "Good Reason"**. For all purposes under this Agreement, "Good Reason" shall mean that you resign within ninety (90) days after one of the following conditions has come into existence without your written consent:

(i) A material diminution in your authority, duties or responsibilities;

(ii) A material reduction of your annual Base Salary; provided, however, that prior to a Change in Control, it shall not be Good Reason if there is a corresponding reduction in the base salaries of all other executive officers of the Company;

(iii) A material change in the geographic location at which you must perform services (a change in location of your office will be considered material only if it increases your current one-way commute by more than fifty (50) miles); or.

(iv) A material breach by the Company of a material provision of this Agreement.

A condition shall not be considered "Good Reason" unless you give the Company written notice of the condition within thirty (30) days after the condition comes into existence and the Company fails to remedy the condition within thirty (30) days after receiving your written notice.

(i) **Definition of "Disability"**. For all purposes under this Agreement, "Disability" shall mean that you are unable to perform the essential functions of your position, with or without reasonable accommodation, for a period of at least one hundred twenty (120) consecutive days because of a physical or mental impairment.

(j) **Definition of "Separation"**. For all purposes under this Agreement, "Separation" shall mean an "involuntary separation from service," as defined in the regulations under Section 409A.

5. **Confidentiality Agreement**. The Company's Confidential Information and Invention Assignment Agreement (the "Confidentiality Agreement"), which you previously executed, remains in full force and effect.

6. **Code Section 280G**. In the event that it is determined that any payment or distribution of any type to or for your benefit made by the Company, any of its affiliates, any person who acquires ownership or effective control of the Company or ownership of a substantial portion of the Company's assets (within the meaning of Code Section 280G, as amended, and the regulations thereunder) or any affiliate of such person, whether paid or payable or distributed or distributable pursuant to the terms of this Agreement or otherwise (the "Total Payments"), would be subject to the excise tax imposed by Section 4999 of the Code or any interest or penalties with respect to such excise tax (such excise tax, together with any such interest or penalties, are collectively referred to as the "Excise Tax"), then such payments or distributions shall be payable either in (i) full or (ii) as to such lesser amount which would result in no portion of such payments or distributions being subject to the Excise Tax, whichever method provides you with the greater payments or distributions on an after-tax basis.

All mathematical determinations and all determinations of whether any of the Total Payments are "parachute payments" (within the meaning of section 280G of the Code) that are required to be made under this Section 6, shall be made by the independent professionals retained by the Company (the "Auditors"), who shall provide their determination (the "Determination"), together with detailed supporting calculations regarding the amount of any relevant matters, both to the Company and to you within twenty (20) business days of your termination date, if applicable, or such earlier time as is requested by the Company or you. Any Determination by the Auditors shall be binding upon the Company and you, absent manifest error. The Company shall pay the fees and costs of the Auditors.

Any reduction in payments and/or benefits required by this Section 6 shall be determined by the Company.

7. Miscellaneous Provisions.

(a) Notice. Notices and all other communications contemplated by this Agreement shall be in writing and shall be deemed to have been duly given when personally delivered or when mailed by U.S. registered or certified mail, return receipt requested and postage prepaid, or Federal Express, with delivery charges prepaid. In your case, mailed notices shall be addressed to you at the home address that you most recently communicated to the Company in writing. In the case of the Company, mailed notices shall be addressed to its corporate headquarters, and all notices shall be directed to the attention of its Secretary.

(b) Modifications and Waivers. No provision of this Agreement shall be modified, waived or discharged unless the modification, waiver or discharge is agreed to in writing and signed by you and by an authorized member of the Compensation Committee. No waiver by either party of any breach of, or of compliance with, any condition or provision of this Agreement by the other party shall be considered a waiver of any other condition or provision or of the same condition or provision at another time.

(c) Whole Agreement. No other agreements, representations or understandings (whether oral or written and whether express or implied) which are not expressly set forth in this Agreement have been made or entered into by either party with respect to the subject matter hereof. This Agreement, the Confidentiality Agreement and the Equity Documentation contain the entire understanding of the parties with respect to the subject matter hereof and supersede and replace your previous offer letter or employment agreement with the Company and any amendments thereto.

(d) Withholding Taxes. All payments made under this Agreement shall be subject to reduction to reflect taxes or other charges required to be withheld by law.

(e) Choice of Law and Severability. This Agreement shall be interpreted in accordance with the laws of the State of California without giving effect to provisions governing the choice of law. If any provision of this Agreement becomes or is deemed invalid, illegal or unenforceable in any applicable jurisdiction by reason of the scope, extent or duration of its coverage, then such provision shall be deemed amended to the minimum extent necessary to conform to applicable law so as to be valid and enforceable or, if such provision cannot be so amended without materially altering the intention of the parties, then such provision shall be stricken and the remainder of this Agreement shall continue in full

force and effect. If any provision of this Agreement is rendered illegal by any present or future statute, law, ordinance or regulation (collectively, the "Law") then that provision shall be curtailed or limited only to the minimum extent necessary to bring the provision into compliance with the Law. All the other terms and provisions of this Agreement shall continue in full force and effect without impairment or limitation.

(f) **Assignment; Successors**. The rights and obligations under this Agreement shall be binding upon and inure to the benefits of any successor (whether direct or indirect and whether by purchase, lease, merger, consolidation, liquidation or otherwise) to all or substantially all of the Company's business and/or assets (a "Successor Entity"). For all purposes under this Agreement, the term "Company" shall include any successor to the Company's business or assets that becomes bound by this Agreement. The Company may assign its rights under this Agreement to any Successor Entity without your consent. This Agreement and all of your rights and obligations hereunder are personal to you and may not be transferred or assigned by you at any time. This Agreement and all of your rights hereunder shall inure to the benefit of, and be enforceable by, your personal or legal representatives, executors, administrators, successors, heirs, distributees, devisees and legatees.

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

[Signature Page Follows]

We are all delighted to be able to continue your employment on the terms and conditions set forth in this Agreement. To indicate your acceptance of the Company's offer and continue your employment with the Company, please sign and date this Agreement in the space provided below and return it to me.

Very truly yours,

TWIST BIOSCIENCE CORPORATION

By: /s/ Emily Leproust
(Signature)

Name: Emily Leproust

Title: CEO

ACCEPTED AND AGREED:

/s/ Paula Green
Paula Green

9/12/2022
Date

Exhibit 10.17

September 9, 2022

William Banyai

Re: **AMENDED AND RESTATED EMPLOYMENT AGREEMENT**

Dear William:

On behalf of Twist Bioscience Corporation, a Delaware corporation (the "Company"), I am pleased to continue your employment with the Company on the terms and conditions set forth in this amended and restated employment agreement (the "Agreement"), effective as of September 9, 2022 (the "Effective Date"). This Agreement amends and restates in its entirety the prior Employment Agreement dated January 8, 2019 by and between you and the Company.

1. Duties and Scope of Employment.

(a) Position. For the term of your employment under this Agreement (your "Employment"), the Company agrees to employ you in the position of Senior Vice President of Advanced Development and GM Data Storage. You shall report to the Company's Chief Executive Officer. You shall perform the duties and have the responsibilities and authority customarily performed and held by an employee in your position or as otherwise may be assigned or delegated to you by the Company's Board.

(b) Obligations to the Company. During your Employment, you shall devote your full business efforts and time to the Company and shall not assist any person or entity in competing with the Company or in preparing to compete with the Company. During your Employment, without the prior written approval of the Company's Chief Executive Officer (the "CEO"), you shall not render services in any capacity to any other person or entity and shall not act as a sole proprietor or partner of any other person or entity or own more than five percent (5%) of the stock of any other corporation. Notwithstanding the foregoing, you may serve on corporate, civic or charitable boards or committees, deliver lectures, fulfill speaking engagements, teach at educational institutions, or manage personal investments without such advance written consent, provided that such activities do not individually or in the aggregate interfere with the performance of your duties under this Agreement. You shall comply with the Company's policies and rules, as they may be in effect from time to time during your Employment.

(c) No Conflicting Obligations. You represent and warrant to the Company that you are under no obligations or commitments, whether contractual or otherwise, that are inconsistent with your obligations under this Agreement. In connection with your Employment, you shall not use or disclose any trade secrets or other proprietary information or intellectual property in which you or any other person has any right, title or interest and your Employment shall not infringe or violate the rights of any other

person. You represent and warrant to the Company that you have returned all property and confidential information belonging to any prior employer.

2. Cash Compensation, Employee Benefits, Equity.

(a) Salary. The Company shall continue to pay you as compensation for your services a base salary of $455,000. Such salary shall be payable in accordance with the Company's standard payroll procedures. The annual compensation specified in this subsection (a), together with any modifications in such compensation that the Company may make from time to time, is referred to in this Agreement as "Base Salary." Your Base Salary may be reviewed on an annual basis by the Board or a Compensation Committee of the Board (the "Compensation Committee") based upon available market data.

(b) Incentive Bonus. You shall be eligible to be considered for an annual incentive bonus each fiscal year during the term of your Employment under this Agreement based upon the achievement of certain objective or subjective criteria established by the Board, the Compensation Committee, and/or the senior management of the Company (each, an "Incentive Bonus"). Your eligibility to earn an annual Incentive Bonus and the target amount of such bonus shall be governed by the terms and conditions as determined by the Board, the Compensation Committee and/or the senior management of the Company each calendar year. Commencing with the 2022 fiscal year, the target amount for any such annual Incentive Bonus will be sixty percent (60%) of your Base Salary (the "Target Incentive Bonus Amount"). The determinations of the Board, the Compensation Committee, and/or the senior management of the Company with respect to such bonus shall be final and binding. Any Incentive Bonus for a fiscal year shall be paid no later than the date that is two and one half (2½) months after the close of the calendar year in which such fiscal year ends, but only if you have continued in employment with the Company until September 30 of such applicable fiscal year.

(c) Employee Benefits. During your Employment, you shall be eligible to participate in the employee benefit plans maintained by the Company and generally available to similarly situated employees of the Company, subject in each case to the generally applicable terms and conditions of the plan in question and to the determinations of any person or committee administering such plan.

(d) Equity. Any shares of the Company's Common Stock, options to purchase shares of the Company's Common Stock (each, an "Option") or restricted stock unit awards with respect to Company Common Stock (each, a "RSU Award") that were previously granted or issued to you shall continue to be governed by the terms and conditions of the agreements evidencing the purchase of such Common Stock, the grant of such Option or the grant of such RSU Award, all of which remain in full force and effect, except that any vesting acceleration with respect to such shares, Option or RSU Awards contained in any agreement, including (without limitation) an offer letter or employment agreement or amendment thereto, a stock option agreement, restricted stock purchase agreement or restricted stock unit agreement, shall be nullified and superseded in its entirety by the vesting acceleration set forth below in Section 4 of this Agreement (collectively, the "Equity Documentation").

3. Termination.

(a) **Employment at Will**. Your Employment shall be "at will," meaning that either you or the Company shall be entitled to terminate your Employment at any time and for any reason, with or without notice or Cause, as defined in Section 4 below. Any contrary representations that may have been made to you shall be superseded by this Agreement. This Agreement shall constitute the full and complete agreement between you and the Company on the "at-will" nature of your Employment, which may only be changed in an express written agreement signed by you and a duly authorized member of the Compensation Committee.

(b) **Rights Upon Termination**. Subject to Section 4 below, upon the termination of your Employment, you shall only be entitled to the compensation and benefits earned and the reimbursements described in this Agreement for the period preceding the effective date of the termination.

4. **Severance Pay**.

(a) **General Release**. Any other provision of this Agreement notwithstanding, Subsections 4(b) and 4(c) shall not apply unless you (i) have returned all Company property in your possession, and (ii) have executed a general release of all claims (the "Release") that you may have against the Company or persons affiliated with the Company in a form prescribed by the Company (collectively, the "Conditions"). The Release must be in the form that is reasonably acceptable to you and the Company. The Company shall deliver the Release to you within ten (10) days after your Separation (as defined below). You must satisfy the Conditions within sixty (60) calendar days following your Separation (the "Deadline").

(b) **Severance Pay Not in Connection with Change in Control**. If, other than during the period commencing on a Change in Control (as defined below) and ending on the twenty-four (24) month anniversary of such Change in Control, inclusive, you experience a Separation as a result of (i) your resignation from Employment for Good Reason (as defined below) or (ii) the Company's termination of your Employment for any reason other than (A) Cause (as defined below), (B) death or (C) Disability (as defined below) (the Separation as a result of (i) or (ii) shall be known as an "Involuntary Termination"), then, in addition to the amounts payable in accordance with Section 3(b), the Company shall pay you with the following severance benefits: (i) your Base Salary for a six (6) month period (the "Severance Period"); plus (ii) a pro-rata Incentive Bonus in respect of the fiscal year including the date of the Involuntary Termination in an amount equal to (x) the Incentive Bonus calculated based on actual performance for the applicable fiscal year multiplied by (y) a fraction, the numerator of which is the number of days you were employed with the Company during the year and the denominator of which is 365 days, which will be payable to the you at the same time that the Company normally pays its bonuses to other employees (but in no event later than March 15th of the year following the year that includes the Involuntary Termination); plus (iii) the health care premiums for you and your dependents under the Consolidated Omnibus Budget Reconciliation Act ("COBRA") for a period equal in length to the Severance Period, commencing on the first date on which you and your dependents lose health care coverage under the Company's health plans as a result of your Involuntary Termination, provided that you and your dependents are eligible for COBRA with respect to the Company's health plans and timely elect COBRA. The payment of such monthly COBRA premiums will be taxable to the extent required to avoid adverse consequences to you or the Company under either Section 105(h) of the Internal Revenue Code of 1986, as amended (the "Code") or the Patient Protection and Affordable Care Act of 2010. Your Base Salary shall be paid at the rate in effect at the time of your Involuntary Termination (ignoring any reduction

in Base Salary that resulted in a resignation for Good Reason) in accordance with the Company's standard payroll procedures on the Company's payroll dates for a period equal in length to the Severance Period, commencing on the Company's first regular payroll date following the last day of the Deadline, and shall be subject to all applicable withholdings; provided that the first payment shall include all amounts that would have been paid had payment commenced on the first payroll date following your termination of Employment.

(c) **Severance Pay in Connection with Change in Control**. If, during the period commencing on a Change In Control and ending on the twenty-four (24) month anniversary of such Change in Control, you experience an Involuntary Termination, inclusive, then, in lieu of the amounts payable in accordance with Section 3(b), the Company shall instead pay you severance pay equal to (i) your Base Salary for a twelve (12) month period (the "CIC Severance Period") plus (ii) an amount equal to times the average of your annual Incentive Bonus paid to you with respect to the two (2) years immediately preceding the year in which your Involuntary Termination occurs plus (iii) a pro-rata Incentive Bonus in respect of the fiscal year including the date of the Involuntary Termination in an amount equal to (x) the Target Incentive Bonus Amount applicable to the year in which your Involuntary Termination occurs multiplied by (y) a fraction, the numerator of which is the number of days you were employed with the Company during the year and the denominator of which is 365 days plus (iv) the health care premiums for you and your dependents under COBRA for a period equal in length to the CIC Severance Period, commencing on the first date on which you and your dependents lose health care coverage under the Company's health plans as a result of your Involuntary Termination, provided that you and your dependents are eligible for COBRA with respect to the Company's health plans and timely elect COBRA plus (v) vesting acceleration with respect to your shares of the Company's Common Stock, Options, RSU Awards and any other equity awards granted to you by the Company that vest based solely upon satisfaction of a time-based vesting schedule (collectively, the "Company Timed-Based Equity"), such that you shall become vested in one hundred percent (100%) of the Company Equity that is unvested and outstanding as of the date of your Involuntary Termination plus (vi) vesting acceleration with respect to any equity awards granted to you by the Company that include a performance-based vesting requirement (the "Company "Performance-Based Equity") such that you shall become vested in the greater of the amount that would become vested based on: (x) achievement at one hundred percent (100%) of target with respect to the Company Performance-Based Equity, or (y) the actual performance with respect to the Company Performance-Based Equity. The payment of such monthly COBRA premiums will be taxable to the extent required to avoid adverse consequences to you or the Company under either Section 105(h) of the Code or the Patient Protection and Affordable Care Act of 2010. Your Base Salary shall be paid at the rate in effect at the time of the termination of your Employment (ignoring any reduction in Base Salary that resulted in a resignation for Good Reason). The severance pay set forth in this Section 4(c), collectively the Base Salary in (i) and the bonuses in (ii) and (iii), shall be aggregated for a total cash severance amount, which shall be paid in substantially equal installments in accordance with the Company's standard payroll procedures on the Company's payroll dates for a period equal in length to the CIC Severance Period, commencing on the Company's first regular payroll date following the last day of the Deadline, and shall be subject to all applicable withholdings; provided that the first payment shall include all amounts that would have been paid had payment commenced on the first payroll date following your termination of Employment. For the avoidance of doubt, upon an Involuntary Termination, you shall be eligible to receive the severance pay and benefits set forth in either Section 4(c) or Section 4(b) above, but not both.

(d) This Section 4, including (without limitation) the severance pay and benefits set forth in Section 4(b) and Section 4(c), shall be in effect for three (3) years from the Effective Date (the "Initial Term Expiration Date"), provided that upon the Initial Term Expiration Date, and each subsequent anniversary of such date, if applicable, the term of your employment under this Agreement will automatically by extended by one (1) year, unless either party hereto provides the other party with written notice as least ninety (90) days before the Initial Term Expiration Date, or such subsequent anniversary of such date, if applicable, of such party's decision not to extend the term of employment under this Agreement any further. Notwithstanding the foregoing, your employment under this Agreement may be terminated at any time before or after the Initial Term Expiration Date, in accordance with Section 3 above.

(e) **Internal Revenue Code Section 409A**. For purposes of Code Section 409A, the regulations and other guidance thereunder and any state law of similar effect (collectively "Section 409A"), each payment that is paid pursuant to this Agreement is hereby designated as a separate payment. The parties intend that all payments made or to be made under this Agreement comply with, or are exempt from, the requirements of Section 409A so that none of the payments or benefits will be subject to the adverse tax penalties imposed under Section 409A, and any ambiguities herein will be interpreted to so comply or be so exempt. Notwithstanding anything stated herein to the contrary, the severance pay provided in connection with your Involuntary Termination under this Section 4 is intended to be exempt from Section 409A pursuant to Treasury Regulation Section 1.409A-1(b)(9)(iii) and to the extent it is exempt pursuant to such section it shall in any event be paid no later than the last day of your second taxable year following the taxable year in which your Involuntary Termination has occurred; provided that, to the extent that such severance and any other payments paid to you in connection with your Involuntary Termination does not qualify or otherwise exceeds the limit set forth in Treasury Regulation Section 1.409A-1(b)(9)(iii)(A) or any similar limit promulgated by the Treasury or the IRS, the portion of the severance pay that does not qualify or otherwise exceeds such limit, as determined by the Company in its sole discretion, shall be paid by no later than the fifteenth (15th) day of the third (3rd) month following the end of your first tax year in which your Involuntary Termination occurs, or, if later, the fifteenth (15th) day of the third (3rd) month following the end of the Company's first tax year in which your Involuntary Termination occurs, as provided in Treasury Regulation Section 1.409A-1(b)(4).

To the extent that any COBRA payment premiums set forth in Section 4(b) or 4(c) above or any other reimbursements or in-kind benefits under this Agreement or otherwise are not exempt from Section 409A, then (i) the benefits provided during any calendar year may not affect the benefits to be provided in any other calendar year; (ii) any payment of COBRA premiums or such other reimbursements or in-kind benefits shall be made on or before the earlier of the last day of the calendar year following the calendar year in which such expense was incurred and the end of the second calendar year following the year of the Involuntary Termination; and (iii) the right to such benefits shall not be subject to liquidation or exchange for another benefit.

Notwithstanding the above, if any of the severance pay provided in connection with your Involuntary Termination does not qualify for any reason to be exempt from Section 409A pursuant to Treasury Regulation Section 1.409A-1(b)(9)(iii) or Treasury Regulation Section 1.409A-1(b)(4) or any other applicable exemption and you are deemed by the Company at the time of your Involuntary Termination to be a "specified employee," as defined in Treasury Regulation Section 1.409A-1(i), each such severance payment shall not be made or commence until the date which is the first (1st) business

day of the seventh (7th) month after your Involuntary Termination and the installments that otherwise would have been paid during the first six (6) months after your Involuntary Termination shall be paid in a lump sum on the first (1st) business day of the seventh (7th) month after your Involuntary Termination, with any remaining severance pay to be paid in accordance with the schedule set forth in Section 4(b) or 4(c) above, as applicable. Such deferral shall only be effected to the extent required to avoid adverse tax treatment to you, including (without limitation) the additional twenty percent (20%) federal tax for which you would otherwise be liable under Section 409A(a)(1)(B) of the Code in the absence of such deferral.

(f) **Definition of "Change in Control"**. "Change in Control" shall have the meaning ascribed to in the Company's 2018 Equity Incentive Plan, as may be amended from time to time (the "Plan") unless otherwise provided for in an Award Agreement (as defined in the Plan).

(g) **Definition of "Cause"**. For all purposes under this Agreement, "Cause" shall mean:

(i) Any material breach by you of this Agreement, the Confidentiality Agreement (as defined below), the Equity Documentation or any other written agreement between you and the Company, which breach to the extent deemed curable by the Board is not cured within ten (10) business days after written notice thereof from the Company;

(ii) Any material failure by you to comply with the Company's written policies or rules, including (without limitation) the Company's ethics or insider trading policies, as they may be in effect from time to time during your Employment, which breach to the extent deemed curable by the Board is not cured within ten (10) business days after written notice thereof from the Company;

(iii) Your repeated failure to follow reasonable and lawful instructions from the Board, which failure is not cured within ten (10) business days after written notice thereof from the Company;

(iv) Commission, conviction of, or a plea of "guilty" or "no contest" to, a felony under the laws of the United States or any State by you if such felony is work-related, impairs your ability to perform services for the Company in accordance with this Agreement, or results in a loss to the Company or damage to the reputation of the Company;

(v) Your misappropriation of funds or property of the Company;

(vi) Gross neglect of your duties;

(vii) Your act or omission that results directly or indirectly in material financial accounting improprieties for the Company;

(viii) Your failure to cooperate with a government investigation; or

(ix) Any gross or willful misconduct by you resulting in a loss to the Company or damage to the reputation of the Company.

(h) **Definition of "Good Reason"**. For all purposes under this Agreement, "Good Reason" shall mean that you resign within ninety (90) days after one of the following conditions has come into existence without your written consent:

(i) A material diminution in your authority, duties or responsibilities;

(ii) A material reduction of your annual Base Salary; provided, however, that prior to a Change in Control, it shall not be Good Reason if there is a corresponding reduction in the base salaries of all other executive officers of the Company;

(iii) A material change in the geographic location at which you must perform services (a change in location of your office will be considered material only if it increases your current one-way commute by more than fifty (50) miles); or.

(iv) A material breach by the Company of a material provision of this Agreement.

A condition shall not be considered "Good Reason" unless you give the Company written notice of the condition within thirty (30) days after the condition comes into existence and the Company fails to remedy the condition within thirty (30) days after receiving your written notice.

(i) **Definition of "Disability"**. For all purposes under this Agreement, "Disability" shall mean that you are unable to perform the essential functions of your position, with or without reasonable accommodation, for a period of at least one hundred twenty (120) consecutive days because of a physical or mental impairment.

(j) **Definition of "Separation"**. For all purposes under this Agreement, "Separation" shall mean an "involuntary separation from service," as defined in the regulations under Section 409A.

5. **Confidentiality Agreement**. The Company's Confidential Information and Invention Assignment Agreement (the "Confidentiality Agreement"), which you previously executed, remains in full force and effect.

6. **Code Section 280G**. In the event that it is determined that any payment or distribution of any type to or for your benefit made by the Company, any of its affiliates, any person who acquires ownership or effective control of the Company or ownership of a substantial portion of the Company's assets (within the meaning of Code Section 280G, as amended, and the regulations thereunder) or any affiliate of such person, whether paid or payable or distributed or distributable pursuant to the terms of this Agreement or otherwise (the "Total Payments"), would be subject to the excise tax imposed by Section 4999 of the Code or any interest or penalties with respect to such excise tax (such excise tax, together with any such interest or penalties, are collectively referred to as the "Excise Tax"), then such payments or distributions shall be payable either in (i) full or (ii) as to such lesser amount which would result in no portion of such payments or distributions being subject to the Excise Tax, whichever method provides you with the greater payments or distributions on an after-tax basis.

All mathematical determinations and all determinations of whether any of the Total Payments are "parachute payments" (within the meaning of section 280G of the Code) that are required to be made under this Section 6, shall be made by the independent professionals retained by the Company (the "Auditors"), who shall provide their determination (the "Determination"), together with detailed supporting calculations regarding the amount of any relevant matters, both to the Company and to you within twenty (20) business days of your termination date, if applicable, or such earlier time as is requested by the Company or you. Any Determination by the Auditors shall be binding upon the Company and you, absent manifest error. The Company shall pay the fees and costs of the Auditors.

Any reduction in payments and/or benefits required by this Section 6 shall be determined by the Company.

7. Miscellaneous Provisions.

(a) Notice. Notices and all other communications contemplated by this Agreement shall be in writing and shall be deemed to have been duly given when personally delivered or when mailed by U.S. registered or certified mail, return receipt requested and postage prepaid, or Federal Express, with delivery charges prepaid. In your case, mailed notices shall be addressed to you at the home address that you most recently communicated to the Company in writing. In the case of the Company, mailed notices shall be addressed to its corporate headquarters, and all notices shall be directed to the attention of its Secretary.

(b) Modifications and Waivers. No provision of this Agreement shall be modified, waived or discharged unless the modification, waiver or discharge is agreed to in writing and signed by you and by an authorized member of the Compensation Committee. No waiver by either party of any breach of, or of compliance with, any condition or provision of this Agreement by the other party shall be considered a waiver of any other condition or provision or of the same condition or provision at another time.

(c) Whole Agreement. No other agreements, representations or understandings (whether oral or written and whether express or implied) which are not expressly set forth in this Agreement have been made or entered into by either party with respect to the subject matter hereof. This Agreement, the Confidentiality Agreement and the Equity Documentation contain the entire understanding of the parties with respect to the subject matter hereof and supersede and replace your previous offer letter or employment agreement with the Company and any amendments thereto.

(d) Withholding Taxes. All payments made under this Agreement shall be subject to reduction to reflect taxes or other charges required to be withheld by law.

(e) Choice of Law and Severability. This Agreement shall be interpreted in accordance with the laws of the State of California without giving effect to provisions governing the choice of law. If any provision of this Agreement becomes or is deemed invalid, illegal or unenforceable in any applicable jurisdiction by reason of the scope, extent or duration of its coverage, then such provision shall be deemed amended to the minimum extent necessary to conform to applicable law so as to be valid and enforceable or, if such provision cannot be so amended without materially altering the intention of the parties, then such provision shall be stricken and the remainder of this Agreement shall continue in full

force and effect. If any provision of this Agreement is rendered illegal by any present or future statute, law, ordinance or regulation (collectively, the "Law") then that provision shall be curtailed or limited only to the minimum extent necessary to bring the provision into compliance with the Law. All the other terms and provisions of this Agreement shall continue in full force and effect without impairment or limitation.

(f) **Assignment; Successors**. The rights and obligations under this Agreement shall be binding upon and inure to the benefits of any successor (whether direct or indirect and whether by purchase, lease, merger, consolidation, liquidation or otherwise) to all or substantially all of the Company's business and/or assets (a "Successor Entity"). For all purposes under this Agreement, the term "Company" shall include any successor to the Company's business or assets that becomes bound by this Agreement. The Company may assign its rights under this Agreement to any Successor Entity without your consent. This Agreement and all of your rights and obligations hereunder are personal to you and may not be transferred or assigned by you at any time. This Agreement and all of your rights hereunder shall inure to the benefit of, and be enforceable by, your personal or legal representatives, executors, administrators, successors, heirs, distributees, devisees and legatees.

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

[Signature Page Follows]

We are all delighted to be able to continue your employment on the terms and conditions set forth in this Agreement. To indicate your acceptance of the Company's offer and continue your employment with the Company, please sign and date this Agreement in the space provided below and return it to me.

Very truly yours,

TWIST BIOSCIENCE CORPORATION

By: /s/ Emily Leproust
(Signature)

Name: Emily Leproust

Title: CEO

ACCEPTED AND AGREED:

/s/ William Banyai
William Banyai

9/12/2022
Date

Exhibit 10.18

September 2, 2024

Dennis Cho

Re: **AMENDED AND RESTATED EMPLOYMENT AGREEMENT**

Dear Dennis:

On behalf of Twist Bioscience Corporation, a Delaware corporation (the "Company"), I am pleased to continue your employment with the Company on the terms and conditions set forth in this amended and restated employment agreement (the "Agreement"), effective as of September 2, 2024 (the "Effective Date"). This Agreement amends and restates in its entirety the prior Employment Agreement dated September 2, 2021 by and between you and the Company.

1. Duties and Scope of Employment.

(a) Position. For the term of your employment under this Agreement (your "Employment"), the Company agrees to employ you in the position of Chief Legal Officer, Chief Ethics & Compliance Officer & Corporate Secretary. You shall report to the Company's Chief Executive Officer. You shall perform the duties and have the responsibilities and authority customarily performed and held by an employee in your position or as otherwise may be assigned or delegated to you by the Company's Chief Executive Officer. You shall continue working as a "remote" employee.

(b) Obligations to the Company. During your Employment, you shall devote your full business efforts and time to the Company and shall not assist any person or entity in competing with the Company or in preparing to compete with the Company. During your Employment, without the prior written approval of the Company's Chief Executive Officer (the "CEO"), you shall not render services in any capacity to any other person or entity and shall not act as a sole proprietor or partner of any other person or entity or own more than five percent (5%) of the stock of any other corporation. Notwithstanding the foregoing, you may serve on corporate, civic or charitable boards or committees, deliver lectures, fulfill speaking engagements, teach at educational institutions, or manage personal investments without such advance written consent, provided that such activities do not individually or in the aggregate interfere with the performance of your duties under this Agreement. You shall comply with the Company's policies and rules, as they may be in effect from time to time during your Employment.

(c) No Conflicting Obligations. You represent and warrant to the Company that you are under no obligations or commitments, whether contractual or otherwise, that are inconsistent with your obligations under this Agreement. In connection with your Employment, you shall not use or disclose any trade secrets or other proprietary information or intellectual property in which you or any other person has any right, title or interest and your Employment shall not infringe or violate the rights of any other person. You represent

and warrant to the Company that you have returned all property and confidential information belonging to any prior employer.

2. Cash Compensation, Employee Benefits, Equity.

(a) Salary. The Company shall continue to pay you as compensation for your services a base salary of $433,000. Such salary shall be payable in accordance with the Company's standard payroll procedures. The annual compensation specified in this subsection (a), together with any modifications in such compensation that the Company may make from time to time, is referred to in this Agreement as "Base Salary." Your Base Salary may be reviewed on an annual basis by the Board or a Compensation Committee of the Board (the "Compensation Committee") based upon available market data.

(b) Incentive Bonus. You shall be eligible to be considered for an annual incentive bonus each fiscal year during the term of your Employment under this Agreement based upon the achievement of certain objective or subjective criteria established by the Board, the Compensation Committee, and/or the senior management of the Company (each, an "Incentive Bonus"). Your eligibility to earn an annual Incentive Bonus and the target amount of such bonus shall be governed by the terms and conditions as determined by the Board, the Compensation Committee and/or the senior management of the Company each calendar year. Commencing with the 2022 fiscal year, the target amount for any such annual Incentive Bonus will be fifty percent (50%) of your Base Salary (the "Target Incentive Bonus Amount"). The determinations of the Board, the Compensation Committee, and/or the senior management of the Company with respect to such bonus shall be final and binding. Any Incentive Bonus for a fiscal year shall be paid no later than the date that is two and one half ($2^1/_2$) months after the close of the calendar year in which such fiscal year ends, but only if you have continued in employment with the Company until September 30 of such applicable fiscal year.

(c) Employee Benefits. During your Employment, you shall be eligible to participate in the employee benefit plans maintained by the Company and generally available to similarly situated employees of the Company, subject in each case to the generally applicable terms and conditions of the plan in question and to the determinations of any person or committee administering such plan.

(d) Equity. Any shares of the Company's Common Stock, options to purchase shares of the Company's Common Stock (each, an "Option") or restricted stock unit awards with respect to Company Common Stock (each, a "RSU Award") that were previously granted or issued to you shall continue to be governed by the terms and conditions of the agreements evidencing the purchase of such Common Stock, the grant of such Option or the grant of such RSU Award, all of which remain in full force and effect, except that any vesting acceleration with respect to such shares, Option or RSU Awards contained in any agreement, including (without limitation) an offer letter or employment agreement or amendment thereto, a stock option agreement, restricted stock purchase agreement or restricted stock unit agreement, shall be nullified and superseded in its entirety by the vesting acceleration set forth below in Section 4 of this Agreement (collectively, the "Equity Documentation").

3. Termination.

(a) Employment at Will. Your Employment shall be "at will," meaning that either you or the Company shall be entitled to terminate your Employment at any time and for any reason, with or

without notice or Cause, as defined in Section 4 below. Any contrary representations that may have been made to you shall be superseded by this Agreement. This Agreement shall constitute the full and complete agreement between you and the Company on the "at-will" nature of your Employment, which may only be changed in an express written agreement signed by you and a duly authorized member of the Compensation Committee.

(b) Rights Upon Termination. Subject to Section 4 below, upon the termination of your Employment, you shall only be entitled to the compensation and benefits earned and the reimbursements described in this Agreement for the period preceding the effective date of the termination.

4. Severance Pay.

(a) General Release. Any other provision of this Agreement notwithstanding, Subsections 4(b) and 4(c) shall not apply unless you (i) have returned all Company property in your possession, and (ii) have executed a general release of all claims (the "Release") that you may have against the Company or persons affiliated with the Company in a form prescribed by the Company (collectively, the "Conditions"). The Release must be in the form that is reasonably acceptable to you and the Company. The Company shall deliver the Release to you within ten (10) days after your Separation (as defined below). You must satisfy the Conditions within sixty (60) calendar days following your Separation (the "Deadline").

(b) Severance Pay Not in Connection with Change in Control. If, other than during the period commencing on a Change in Control (as defined below) and ending on the twenty-four (24) month anniversary of such Change in Control, inclusive, you experience a Separation as a result of (i) your resignation from Employment for Good Reason (as defined below) or (ii) the Company's termination of your Employment for any reason other than (A) Cause (as defined below), (B) death or (C) Disability (as defined below) (the Separation as a result of (i) or (ii) shall be known as an "Involuntary Termination"), then, in addition to the amounts payable in accordance with Section 3(b), the Company shall pay you with the following severance benefits: (i) your Base Salary for a six (6) month period (the "Severance Period"); plus (ii) a pro-rata Incentive Bonus in respect of the fiscal year including the date of the Involuntary Termination in an amount equal to (x) the Incentive Bonus calculated based on actual performance for the applicable fiscal year multiplied by (y) a fraction, the numerator of which is the number of days you were employed with the Company during the year and the denominator of which is 365 days, which will be payable to the you at the same time that the Company normally pays its bonuses to other employees (but in no event later than March 15th of the year following the year that includes the Involuntary Termination); plus (iii) the health care premiums for you and your dependents under the Consolidated Omnibus Budget Reconciliation Act ("COBRA") for a period equal in length to the Severance Period, commencing on the first date on which you and your dependents lose health care coverage under the Company's health plans as a result of your Involuntary Termination, provided that you and your dependents are eligible for COBRA with respect to the Company's health plans and timely elect COBRA. The payment of such monthly COBRA premiums will be taxable to the extent required to avoid adverse consequences to you or the Company under either Section 105(h) of the Internal Revenue Code of 1986, as amended (the "Code") or the Patient Protection and Affordable Care Act of 2010. Your Base Salary shall be paid at the rate in effect at the time of your Involuntary Termination (ignoring any reduction in Base Salary that resulted in a resignation for Good Reason) in accordance with the Company's standard payroll procedures on the Company's payroll dates for a period equal in length to the Severance Period, commencing on the Company's first regular payroll date following the last day of the Deadline, and shall be subject to all applicable withholdings; provided that the first payment shall include all amounts that would have been paid had payment

commenced on the first payroll date following your termination of Employment.

(c) Severance Pay in Connection with Change in Control. If, during the period commencing on a Change In Control and ending on the twenty-four (24) month anniversary of such Change in Control, you experience an Involuntary Termination, inclusive, then, in lieu of the amounts payable in accordance with Section 3(b), the Company shall instead pay you severance pay equal to (i) your Base Salary for a twelve (12) month period (the "CIC Severance Period") plus (ii) an amount equal to times the average of your annual Incentive Bonus paid to you with respect to the two (2) years immediately preceding the year in which your Involuntary Termination occurs plus (iii) a pro-rata Incentive Bonus in respect of the fiscal year including the date of the Involuntary Termination in an amount equal to (x) the Target Incentive Bonus Amount applicable to the year in which your Involuntary Termination occurs multiplied by (y) a fraction, the numerator of which is the number of days you were employed with the Company during the year and the denominator of which is 365 days plus (iv) the health care premiums for you and your dependents under COBRA for a period equal in length to the CIC Severance Period, commencing on the first date on which you and your dependents lose health care coverage under the Company's health plans as a result of your Involuntary Termination, provided that you and your dependents are eligible for COBRA with respect to the Company's health plans and timely elect COBRA plus (v) vesting acceleration with respect to your shares of the Company's Common Stock, Options, RSU Awards and any other equity awards granted to you by the Company that vest based solely upon satisfaction of a time-based vesting schedule (collectively, the "Company Timed-Based Equity"), such that you shall become vested in one hundred percent (100%) of the Company Equity that is unvested and outstanding as of the date of your Involuntary Termination plus (vi) vesting acceleration with respect to any equity awards granted to you by the Company that include a performance-based vesting requirement (the "Company "Performance-Based Equity") such that you shall become vested in the greater of the amount that would become vested based on: (x) achievement at one hundred percent (100%) of target with respect to the Company Performance-Based Equity, or (y) the actual performance with respect to the Company Performance-Based Equity. The payment of such monthly COBRA premiums will be taxable to the extent required to avoid adverse consequences to you or the Company under either Section 105(h) of the Code or the Patient Protection and Affordable Care Act of 2010. Your Base Salary shall be paid at the rate in effect at the time of the termination of your Employment (ignoring any reduction in Base Salary that resulted in a resignation for Good Reason). The severance pay set forth in this Section 4(c), collectively the Base Salary in (i) and the bonuses in (ii) and (iii), shall be aggregated for a total cash severance amount, which shall be paid in substantially equal installments in accordance with the Company's standard payroll procedures on the Company's payroll dates for a period equal in length to the CIC Severance Period, commencing on the Company's first regular payroll date following the last day of the Deadline, and shall be subject to all applicable withholdings; provided that the first payment shall include all amounts that would have been paid had payment commenced on the first payroll date following your termination of Employment. For the avoidance of doubt, upon an Involuntary Termination, you shall be eligible to receive the severance pay and benefits set forth in either Section 4(c) or Section 4(b) above, but not both.

(d) This Section 4, including (without limitation) the severance pay and benefits set forth in Section 4(b) and Section 4(c), shall be in effect for three (3) years from the Effective Date (the "Initial Term Expiration Date"), provided that upon the Initial Term Expiration Date, and each subsequent anniversary of such date, if applicable, the term of your employment under this Agreement will automatically by extended by one (1) year, unless either party hereto provides the other party with written notice as least ninety (90) days

before the Initial Term Expiration Date, or such subsequent anniversary of such date, if applicable, of such party's decision not to extend the term of employment under this Agreement any further. Notwithstanding the foregoing, your employment under this Agreement may be terminated at any time before or after the Initial Term Expiration Date, in accordance with Section 3 above.

(e) Internal Revenue Code Section 409A. For purposes of Code Section 409A, the regulations and other guidance thereunder and any state law of similar effect (collectively "Section 409A"), each payment that is paid pursuant to this Agreement is hereby designated as a separate payment. The parties intend that all payments made or to be made under this Agreement comply with, or are exempt from, the requirements of Section 409A so that none of the payments or benefits will be subject to the adverse tax penalties imposed under Section 409A, and any ambiguities herein will be interpreted to so comply or be so exempt. Notwithstanding anything stated herein to the contrary, the severance pay provided in connection with your Involuntary Termination under this Section 4 is intended to be exempt from Section 409A pursuant to Treasury Regulation Section 1.409A-1(b)(9)(iii) and to the extent it is exempt pursuant to such section it shall in any event be paid no later than the last day of your second taxable year following the taxable year in which your Involuntary Termination has occurred; provided that, to the extent that such severance and any other payments paid to you in connection with your Involuntary Termination does not qualify or otherwise exceeds the limit set forth in Treasury Regulation Section 1.409A-1(b)(9)(iii)(A) or any similar limit promulgated by the Treasury or the IRS, the portion of the severance pay that does not qualify or otherwise exceeds such limit, as determined by the Company in its sole discretion, shall be paid by no later than the fifteenth (15th) day of the third (3rd) month following the end of your first tax year in which your Involuntary Termination occurs, or, if later, the fifteenth (15th) day of the third (3rd) month following the end of the Company's first tax year in which your Involuntary Termination occurs, as provided in Treasury Regulation Section 1.409A-1(b)(4).

To the extent that any COBRA payment premiums set forth in Section 4(b) or 4(c) above or any other reimbursements or in-kind benefits under this Agreement or otherwise are not exempt from Section 409A, then (i) the benefits provided during any calendar year may not affect the benefits to be provided in any other calendar year; (ii) any payment of COBRA premiums or such other reimbursements or in-kind benefits shall be made on or before the earlier of the last day of the calendar year following the calendar year in which such expense was incurred and the end of the second calendar year following the year of the Involuntary Termination; and (iii) the right to such benefits shall not be subject to liquidation or exchange for another benefit.

Notwithstanding the above, if any of the severance pay provided in connection with your Involuntary Termination does not qualify for any reason to be exempt from Section 409A pursuant to Treasury Regulation Section 1.409A-1(b)(9)(iii) or Treasury Regulation Section 1.409A-1(b)(4) or any other applicable exemption and you are deemed by the Company at the time of your Involuntary Termination to be a "specified employee," as defined in Treasury Regulation Section 1.409A-1(i), each such severance payment shall not be made or commence until the date which is the first (1st) business day of the seventh (7th) month after your Involuntary Termination and the installments that otherwise would have been paid during the first six (6) months after your Involuntary Termination shall be paid in a lump sum on the first (1st) business day of the seventh (7th) month after your Involuntary Termination, with any remaining severance pay to be paid in accordance with the schedule set forth in Section 4(b) or 4(c) above, as applicable. Such deferral shall only be effected to the extent required to avoid adverse tax treatment to you, including (without limitation) the additional twenty

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percent (20%) federal tax for which you would otherwise be liable under Section 409A(a)(1)(B) of the Code in the absence of such deferral.

(f) Definition of "Change in Control". "Change in Control" shall have the meaning ascribed to in the Company's 2018 Equity Incentive Plan, as may be amended from time to time (the "Plan") unless otherwise provided for in an Award Agreement (as defined in the Plan).

(g) Definition of "Cause". For all purposes under this Agreement, "Cause" shall mean:

(i) Any material breach by you of this Agreement, the Confidentiality Agreement (as defined below), the Equity Documentation or any other written agreement between you and the Company, which breach to the extent deemed curable by the Board is not cured within ten (10) business days after written notice thereof from the Company;

(ii) Any material failure by you to comply with the Company's written policies or rules, including (without limitation) the Company's ethics or insider trading policies, as they may be in effect from time to time during your Employment, which breach to the extent deemed curable by the Board is not cured within ten (10) business days after written notice thereof from the Company;

(iii) Your repeated failure to follow reasonable and lawful instructions from the Board, which failure is not cured within ten (10) business days after written notice thereof from the Company;

(iv) Commission, conviction of, or a plea of "guilty" or "no contest" to, a felony under the laws of the United States or any State by you if such felony is work-related, impairs your ability to perform services for the Company in accordance with this Agreement, or results in a loss to the Company or damage to the reputation of the Company;

(v) Your misappropriation of funds or property of the Company;

(vi) Gross neglect of your duties;

(vii) Your act or omission that results directly or indirectly in material financial accounting improprieties for the Company;

(viii) Your failure to cooperate with a government investigation; or

(ix) Any gross or willful misconduct by you resulting in a loss to the Company or damage to the reputation of the Company.

(h) Definition of "Good Reason". For all purposes under this Agreement, "Good Reason" shall mean that you resign within ninety (90) days after one of the following conditions has come into existence without your written consent:

(i) A material diminution in your authority, duties or responsibilities;

(ii) A material reduction of your annual Base Salary; provided, however, that prior to a Change in Control, it shall not be Good Reason if there is a corresponding reduction in the base salaries of all other executive officers of the Company;

(iii) A material change in the geographic location at which you must perform services (a change in location of your office will be considered material only if it increases your current one-way commute by more than fifty (50) miles); or.

(iv) A material breach by the Company of a material provision of this Agreement.

A condition shall not be considered "Good Reason" unless you give the Company written notice of the condition within thirty (30) days after the condition comes into existence and the Company fails to remedy the condition within thirty (30) days after receiving your written notice.

(i) Definition of "Disability". For all purposes under this Agreement, "Disability" shall mean that you are unable to perform the essential functions of your position, with or without reasonable accommodation, for a period of at least one hundred twenty (120) consecutive days because of a physical or mental impairment.

(j) Definition of "Separation". For all purposes under this Agreement, "Separation" shall mean an "involuntary separation from service," as defined in the regulations under Section 409A.

5. Confidentiality Agreement. The Company's Confidential Information and Invention Assignment Agreement (the "Confidentiality Agreement"), which you previously executed, remains in full force and effect.

6. Code Section 280G. In the event that it is determined that any payment or distribution of any type to or for your benefit made by the Company, any of its affiliates, any person who acquires ownership or effective control of the Company or ownership of a substantial portion of the Company's assets (within the meaning of Code Section 280G, as amended, and the regulations thereunder) or any affiliate of such person, whether paid or payable or distributed or distributable pursuant to the terms of this Agreement or otherwise (the "Total Payments"), would be subject to the excise tax imposed by Section 4999 of the Code or any interest or penalties with respect to such excise tax (such excise tax, together with any such interest or penalties, are collectively referred to as the "Excise Tax"), then such payments or distributions shall be payable either in (i) full or (ii) as to such lesser amount which would result in no portion of such payments or distributions being subject to the Excise Tax, whichever method provides you with the greater payments or distributions on an after-tax basis.

All mathematical determinations and all determinations of whether any of the Total Payments are "parachute payments" (within the meaning of section 280G of the Code) that are required to be made under this Section 6, shall be made by the independent professionals retained by the Company (the "Auditors"), who shall provide their determination (the "Determination"), together with detailed supporting calculations regarding the amount of any relevant matters, both to the Company and to you within twenty (20) business days of your termination date, if applicable, or such earlier time as is requested by the Company or you.

Any Determination by the Auditors shall be binding upon the Company and you, absent manifest error. The Company shall pay the fees and costs of the Auditors.

Any reduction in payments and/or benefits required by this Section 6 shall be determined by the Company.

7. Miscellaneous Provisions.

(a) Notice. Notices and all other communications contemplated by this Agreement shall be in writing and shall be deemed to have been duly given when personally delivered or when mailed by U.S. registered or certified mail, return receipt requested and postage prepaid, or Federal Express, with delivery charges prepaid. In your case, mailed notices shall be addressed to you at the home address that you most recently communicated to the Company in writing. In the case of the Company, mailed notices shall be addressed to its corporate headquarters, and all notices shall be directed to the attention of its Secretary.

(b) Modifications and Waivers. No provision of this Agreement shall be modified, waived or discharged unless the modification, waiver or discharge is agreed to in writing and signed by you and by an authorized member of the Compensation Committee. No waiver by either party of any breach of, or of compliance with, any condition or provision of this Agreement by the other party shall be considered a waiver of any other condition or provision or of the same condition or provision at another time.

(c) Whole Agreement. No other agreements, representations or understandings (whether oral or written and whether express or implied) which are not expressly set forth in this Agreement have been made or entered into by either party with respect to the subject matter hereof. This Agreement, the Confidentiality Agreement and the Equity Documentation contain the entire understanding of the parties with respect to the subject matter hereof and supersede and replace your previous offer letter or employment agreement with the Company and any amendments thereto.

(d) Withholding Taxes. All payments made under this Agreement shall be subject to reduction to reflect taxes or other charges required to be withheld by law.

(e) Choice of Law and Severability. This Agreement shall be interpreted in accordance with the laws of the State of California without giving effect to provisions governing the choice of law. If any provision of this Agreement becomes or is deemed invalid, illegal or unenforceable in any applicable jurisdiction by reason of the scope, extent or duration of its coverage, then such provision shall be deemed amended to the minimum extent necessary to conform to applicable law so as to be valid and enforceable or, if such provision cannot be so amended without materially altering the intention of the parties, then such provision shall be stricken and the remainder of this Agreement shall continue in full force and effect. If any provision of this Agreement is rendered illegal by any present or future statute, law, ordinance or regulation (collectively, the "Law") then that provision shall be curtailed or limited only to the minimum extent necessary to bring the provision into compliance with the Law. All the other terms and provisions of this Agreement shall continue in full force and effect without impairment or limitation.

(f) Assignment; Successors. The rights and obligations under this Agreement shall be binding upon and inure to the benefits of any successor (whether direct or indirect and whether by purchase, lease, merger, consolidation, liquidation or otherwise) to all or substantially all of the Company's

business and/or assets (a "Successor Entity"). For all purposes under this Agreement, the term "Company" shall include any successor to the Company's business or assets that becomes bound by this Agreement. The Company may assign its rights under this Agreement to any Successor Entity without your consent. This Agreement and all of your rights and obligations hereunder are personal to you and may not be transferred or assigned by you at any time. This Agreement and all of your rights hereunder shall inure to the benefit of, and be enforceable by, your personal or legal representatives, executors, administrators, successors, heirs, distributees, devisees and legatees.

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

[Signature Page Follows]

We are all delighted to be able to continue your employment on the terms and conditions set forth in this Agreement. To indicate your acceptance of the Company's offer and continue your employment with the Company, please sign and date this Agreement in the space provided below and return it to me.

Very truly yours,

TWIST BIOSCIENCE CORPORATION

By: /s/ Emily Proust

Name: Emily Proust

Title: CEO

ACCEPTED AND AGREED:

/s/ Dennis Cho

Dennis Cho

9/11/2024

Date

681 GATEWAY BLVD
SOUTH SAN FRANCISCO, CA 94080
TWISTBIOSCIENCE.COM

TWIST BIOSCIENCE CORPORATION

April 24, 2023

Robert Werner
[***]

Dear Robert:

Twist Bioscience Corporation, a Delaware corporation (the "Company"), is pleased to offer you employment with the Company on the terms described below.

1. **Position**. You will start in a full-time position as Vice President, Chief Accounting Officer and you will initially report to Jim Thorburn, CFO. A senior executive role reporting directly to the CFO. The Vice President, Chief Accounting Officer "CAO" will work closely with and partner with the CFO to determine accounting and tax implications for material business decisions. By signing this letter, you confirm with the Company that you are under no contractual or other legal obligations that would prohibit you from performing your duties with the Company.

2. **Compensation**. You will be paid a starting salary at the rate of $400,000.00 per year, which will be paid in accordance with the Company's standard payroll policies and subject to applicable withholdings and other required deductions. You will also be eligible for a bonus based on Company and individual milestones, and subject to the approval of the Board. You will receive a Guaranteed Bonus for the 2023 fiscal year of $100,000.00. You will not be eligible for any additional 2023 fiscal year corporate bonuses. You will earn, and be permitted to retain, the full amount of the Guaranteed Bonus if you remain employed by the Company through the two (2) year anniversary of your Start Date. By Signing below, you acknowledge and agree that, if before such two (2) year anniversary date, your employment terminates for any reason, you will be required to immediately repay all or a pro-rata portion of the Signing Bonus no later than thirty (30) days following the last day of your employment with the Company, with such pro-rata amount based on the number of years employed during such two (2) year period (i.e., if you are employed (i) less than one year, you must repay 100% of the Guaranteed Bonus; (ii) more than one year and less than two years, you must repay 50% of the Guaranteed Bonus.

3. **Equity Award**. Subject to the approval of the Company's Board of Directors (the "Board"), you will be granted 30,000 shares of the Company's Common Stock (the "Equity Award"). In addition, during the Company's 2023 fiscal year performance review you will receive an additional Equity Award of 10,000 shares. The Equity Award will be in the form of restricted stock units (the "RSU Award"). You will be expected to execute the Company's standard form of restricted stock unit award agreement for the RSU Award (the "Award Agreement"), and agree to be subject to such terms and conditions as set forth in the Plan and the Award Agreement. The RSU Award will vest as follows: (x) 25% of the RSUs subject to the RSU Award on the one (1) year anniversary of your start date, and (y) 1/16 of the RSUs subject to the RSU Award quarterly thereafter on the same day of the month as your start date (or the last date of the month if such date does not exist), for a total vesting period of 48 months, subject to your Continuous Service Status (as defined in the Plan) through each vesting date.

4. **Employee Benefits**. As a regular employee of the Company, you will be eligible to participate in the employee benefit plans and programs, if any, currently and hereafter maintained by the

Company and generally available to similarly situated employees of the Company, subject in each case to the terms and conditions of the plan in question, including any eligibility requirements set forth therein, and the determination of any person or committee administering the plan. Notwithstanding the foregoing, the Company reserves the right to modify job titles and salaries and to modify or terminate benefits from time to time as it deems necessary or appropriate.

5. **Confidential Information and Invention Assignment Agreement**. Like all Company employees, you will be required, as a condition of your employment with the Company, to sign the Company's enclosed standard Confidential Information and Invention Assignment Agreement.

6. **Employment Relationship**. Employment with the Company is for no specific period of time. Your employment with the Company will be "at will," meaning that either you or the Company may terminate your employment at any time and for any reason, with or without cause or notice. Any contrary representations which may have been made to you are superseded by this offer. This is the full and complete agreement between you and the Company on this term. Although your job duties, title, compensation and benefits, as well as the Company's personnel policies and procedures, may change from time to time, the "at will" nature of your employment may only be changed in an express written agreement signed by you and the Company's Chief Executive Officer.

7. **Outside Activities**. While you render services to the Company, you agree that you will not engage in any other employment, consulting or other business activity without the written consent of the Company. In addition, while you render services to the Company, you will not assist any person or entity in competing with the Company, in preparing to compete with the Company or in hiring any employees or consultants of the Company.

8. **Taxes, Withholding and Required Deductions**. All forms of compensation referred to in this letter are subject to all applicable taxes, withholding and any other deductions required by applicable law.

9. **Miscellaneous**.

(a) **Governing Law**. The validity, interpretation, construction and performance of this letter, and all acts and transactions pursuant hereto and the rights and obligations of the parties hereto shall be governed, construed and interpreted in accordance with the laws of the state of California, without giving effect to principles of conflicts of law.

(b) **Entire Agreement**. This Agreement sets forth the entire agreement and understanding of the parties relating to the subject matter herein and supersedes all prior or contemporaneous discussions, understandings and agreements, whether oral or written, between them relating to the subject matter hereof.

(c) **Counterparts**. This letter may be executed in any number of counterparts, each of which when so executed and delivered shall be deemed an original, and all of which together shall constitute one and the same agreement. Execution of a facsimile copy will have the same force and effect as execution of an original, and a facsimile signature will be deemed an original and valid signature.

(d) **Electronic Delivery**. The Company may, in its sole discretion, decide to deliver any documents or notices related to this letter, securities of the Company or any of its affiliates or any other matter, including documents and/or notices required to be delivered to you by applicable securities law or any other law or the Company's Certificate of Incorporation or Bylaws by email or any other electronic means. You hereby consent to (i) conduct business electronically (ii) receive such documents and notices by such electronic delivery and (iii) sign documents electronically and agree to participate through an on-line or electronic system established and maintained by the Company or a third party designated by the Company.

[*Signature Page Follows*]

If you wish to accept this offer, please sign and date both this original letter and the enclosed Confidential Information and Invention Assignment Agreement and return them to the recruitment team. As required by law, your employment with the Company is also contingent upon your providing legal proof of your identity and authorization to work in the United States. In addition, the Company reserves the right to conduct background investigations and/or reference checks on all of its potential employees to the extent permitted by applicable law. Your job offer, therefore, may be contingent upon a clearance of such a background investigation and/or reference check, if any. This offer, if not accepted, will expire at the close of business on April 27, 2023.

We look forward to your favorable reply and to working with you at Twist Bioscience!

Very truly yours,

Twist Bioscience Corporation

By: /s/ Emily Leproust

(Signature)

Name: Dr. Emily Leproust
Title: Chief Executive Officer

ACCEPTED AND AGREED:

ROBERT WERNER

/s/ Robert Werner
(Signature)

4/27/2023
Date

Anticipated Start Date: May 29, 2023

Attachment A: Confidential Information and Invention Assignment Agreement

ATTACHMENT A

CONFIDENTIAL INFORMATION AND INVENTION ASSIGNMENT AGREEMENT

(See Attached)

TWIST BIOSCIENCE CORPORATION

INSIDER TRADING COMPLIANCE PROGRAM

This Insider Trading Compliance Program (this "Program") consists of four sections:

Section I provides an overview; Section II sets forth the policies of Twist Bioscience Corporation (together with its subsidiaries, the "Company") prohibiting insider trading; Section III explains insider trading; and Section IV consists of various procedures which have been put in place by the Company to prevent insider trading. This Program shall be overseen and managed by the Company's Corporate Secretary (the "Insider Trading Program Manager"). The Corporate Secretary may delegate authority to administer the Program. In all cases where the Company's Corporate Secretary or his/her designee is unavailable, the Company's Chief Executive Officer may fill such role.

I. SUMMARY

Preventing insider trading is necessary to comply with securities laws and to preserve the reputation and integrity of the Company as well as that of all persons affiliated with it. "Insider trading" occurs when any person 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 (3) times the profit gained or loss avoided, and criminal fines of up to $5 million for individuals and $25 million for entities. Insider trading is also prohibited by this Program and could result in serious sanctions, including dismissal.

This Program applies to all officers, directors and employees of the Company and extends to all activities within and outside an individual's duties at the Company. In the discretion of the Insider Trading Program Manager, this Program may also apply to consultants and contractors to the Company. Every officer, director and employee must review this Program. Questions regarding this Program should be directed to the Insider Trading Program Manager.

For purposes of this Program, the Company's securities include common shares, stock awards covering common shares and any other securities the Company may issue from time to time, such as preferred shares, notes, warrants and convertible debentures. The Company's securities also include derivative securities relating to the Company's shares, even if not issued by the Company, such as exchange-traded options.

II. STATEMENT OF POLICIES PROHIBITING INSIDER TRADING

1. Prohibition against Insider Trading and Other Transactions

The Company will not transact in its own securities, except in compliance with applicable securities laws.

No officer, director or employee shall purchase or sell, or otherwise transact in, any type of security of the Company while in possession of material, non-public information relating to the Company. . In addition, no officer, director or employee shall engage in transactions in securities of other publicly traded companies with which the Company has a business relationship while aware of material,

non-public information about those companies learned in connection with such person's role at, or relationship with, the Company.

Additionally, except for certain transactions under Company plans and transactions not involving a purchase or sale discussed below under Sections II. 2 and 3, **no officer, director or employee shall purchase or sell any security of the Company during the period beginning two (2) weeks before the end of any fiscal quarter of the Company (December 31, March 31, June 30 and September 30) and ending two (2) full trading days after the public release of earnings data for such fiscal quarter whether or not the Company or any of its officers, directors or employees is in possession of material, non-public information (the "Black-Out Period")**. In the event that you leave the Company for any reason, this Program will continue to apply to you until the later of: (1) the end of the Black-Out Period for the fiscal quarter in which you leave the Company or (2) the second trading day after any material nonpublic information known to you has become public or is no longer material. The pre-clearance procedures, however, will cease to apply to transactions in the Company's securities upon the expiration of any Black-Out Period or other Company-imposed trading restrictions applicable at the time of the termination of service.

From time to time, at the discretion of the Insider Trading Program Manager or the Board of Directors, the Company may:

(a) make temporary changes to the Black-Out Periods, including without limitation, extensions of any Black-Out Periods; and

(b) determine that designated persons should suspend trading because of developments known to the Company and not yet disclosed to the public. During such event-specific trading suspension, no designated person may engage in any transaction involving the purchase or sale of the Company's securities nor disclose to others the fact of such suspension of trading.

Even outside of the Black-Out Period trading prohibition, any person possessing material nonpublic information concerning the Company should not engage in any transactions in the Company's securities until such information has been known publicly for at least two (2) trading days, whether or not the Company has recommended a suspension of trading to that person. If an individual is aware of material non-public information when his or her employment terminates, the individual may not trade in the Company's securities until that information has become public or is no longer material. **Trading in the Company's securities outside of the Black-Out Period should not be considered a "safe harbor," and all persons should use sound judgment at all times to make sure that their trades are not effected while they are in possession of material non-public information about the Company.**

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 or employee 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 written approval by the Insider Trading Program Manager and execution of an appropriate confidentiality agreement), or to anyone within the Company other than on a need-to-know basis.

The Company has determined that there is a heightened legal risk and/or the appearance of improper or inappropriate conduct if the persons subject to this Program engage in certain types of

transactions. It therefore is the Company's policy that any persons covered by this Program may not engage in any of the following transactions:

- Short Sales. Short sales of Company securities (i.e., the sale of a security that the seller does not own) may evidence an expectation on the part of the seller that the securities will decline in value, and therefore have the potential to signal to the market that the seller lacks confidence in the Company's prospects. In addition, short sales may reduce a seller's incentive to seek to improve the Company's performance. For these reasons, short sales of Company securities are prohibited. In addition, Section 16(c) of the Exchange Act prohibits officers and directors from engaging in short sales. (Short sales arising from certain types of hedging transactions are governed by the paragraph below captioned "Hedging Transactions.")
- Hedging Transactions. Hedging or monetization transactions can be accomplished through a number of possible mechanisms, including through the use of financial instruments such as prepaid variable forwards, equity swaps, collars and exchange funds. Such hedging transactions may permit a director, officer or employee to continue to own Company securities obtained through employee benefit plans or otherwise, but without the full risks and rewards of ownership. When that occurs, the director, officer or employee may no longer have the same objectives as the Company's other shareholders. Therefore, directors, officers and employees are prohibited from engaging in any such transactions.

- Margin Accounts and Pledged Securities. Securities held in a margin account as collateral for a margin loan may be sold by the broker without the customer's consent if the customer fails to meet a margin call. Similarly, securities pledged (or hypothecated) as collateral for a loan may be sold in foreclosure if the borrower defaults on the loan. Because a margin sale or foreclosure sale may occur at a time when the pledgor is aware of material nonpublic information or otherwise is not permitted to trade in Company securities, directors, officers and other employees are prohibited from holding Company securities in a margin account or otherwise pledging Company securities as collateral for a loan.

2. **Transactions under Company Plans**

This Program does not apply in the case of the following transactions, except as specifically noted:

- Stock Option Exercises. This Program does not apply to the grant and exercise of an employee stock option covering shares of the Company's common stock ("Stock"), or to the withholding of shares of Stock subject to such option to satisfy tax withholding requirements. This Program does apply, however, to any sale of Stock as part of a same-day broker-assisted cashless exercise of an option, or any other market sale.

- Restricted Stock and Restricted Stock Unit Awards. This Program does not apply to the grant and vesting of restricted Stock and restricted stock units covering shares of Stock, or the withholding of shares of Stock to satisfy tax withholding requirements upon the vesting of any restricted stock or restricted stock units. This Program does apply, however, to any broker-assisted sale, or any other market sale.

- Employee Stock Purchase Plan. This Program does not apply to purchases of shares of Stock pursuant to an employee stock purchase plan resulting from your periodic or lump sum contribution of money to the plan pursuant to the election you made at the time of your enrollment in the plan, to the extent the Company offers such a plan. This Program does apply, however, to your sales of Company securities purchased pursuant to such plan.

- Other Similar Transactions. Any other purchase of Company securities from the Company or sales of Company securities to the Company are not subject to this Program.

3. **Sell to Cover Transactions**

This Program does not apply to sell to cover transactions, to the extent approved and implemented by the Company, where shares are withheld by the Company upon vesting of equity awards and sold in order to satisfy tax withholding requirements. However, this exception does not apply to any other market sale for the purposes of paying required tax withholdings.

4. **Transactions Not Involving a Purchase or Sale**

Bona fide gifts of securities, including transfers to controlled entities (as defined below) for estate planning purposes, are subject to this Program including preclearance if applicable. Transactions in mutual funds that are invested in Company securities are not transactions subject to this Program.

III. EXPLANATION OF INSIDER TRADING

As noted above, "insider trading" refers to the purchase or sale 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 stock awards, 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 grant, and vesting and, if applicable, exercise of stock awards 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 persons 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 or sale of a security while in possession of such information.

1. **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 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.

Although it is not possible to list all types of material information, the following are a few examples of information that is particularly sensitive and should be treated as material:

- changes in earnings and sales forecasts;
- increases or decreases in dividend payments;
- share splits or securities offerings;
- significant contracts and technology licenses;
- changes in management;
- changes in auditors;
- the introduction of important products or services;
- potentially significant litigation development;
- major marketing changes;
- unusual gains or losses in major operations;
- public or private sales by the Company of a significant amount of securities;
- purchase or sale of a significant asset;
- significant labor dispute;
- significant financial liquidity problems;
- establishment of a repurchase program for the Company's securities.

In addition, 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.**

2. 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, or PR Newswire. 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, for example, you should generally allow at least two (2) full trading days for the investing public to absorb and evaluate the information before you trade in the Company's securities.

3. Who is an Insider?

"Insiders" include officers, directors and employees of a company and anyone else 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 and employees of the Company should consider themselves insiders with respect to material, non-public information about the Company's business, activities and securities. Officers, directors and employees 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.

It should be noted that trading by members of an officer's, director's or employee's household can be the responsibility of such officer, director or employee under certain circumstances and could give

rise to legal and Company-imposed sanctions. In addition, this Program also applies to all trusts, family partnerships and other types of entities formed for your benefit or for the benefit of a member of your family and over which you have the ability to influence or direct investment decisions concerning securities (collectively referred to as "controlled entities"), and transactions by controlled entities should be treated for the purposes of this policy and applicable securities laws as if they were for your own account.

4. Trading by Persons Other than Insiders

Insiders may be liable for communicating or tipping material, non-public information to a third party (a "tippee"), and insider trading violations are not limited to trading or tipping by insiders. Persons 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.

5. **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 Securities and Exchange Commission (the "SEC") and the U.S. 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, which may change from time to time, 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 (3) 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) of up to the greater of $1 million or three (3) times the amount of profit gained or loss avoided by the violator;
- Criminal fines for individual violators of up to $5 million ($25 million for an entity); and
- Jail sentences of up to twenty (20) years.

In addition, insider trading could result in serious sanctions by the Company, including dismissal. Insider trading violations are not limited to violations of the 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, also may be violated upon the occurrence of insider trading.

6. **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 employee of X Corporation learns that earnings to be reported by X Corporation will increase dramatically. Prior to the public announcement of such earnings, the employee purchases X Corporation's stock. The employee, an insider, is liable for all profits as well as penalties of up to three (3) times the amount of all profits. The employee also is subject to, among other things, criminal prosecution, including up to $5 million in additional fines and twenty (20) years in jail. Depending upon the circumstances, X Corporation and the individual to whom the employee reports could also be liable as controlling persons.

Trading by Tippee

An employee of X Corporation tells a friend that X Corporation is about to publicly announce that it has concluded an agreement for a major acquisition. This tip causes the friend to purchase X Corporation's stock in advance of the announcement. The employee is jointly liable with his friend for all of the friend's profits and each is liable for all penalties of up to three (3) times the amount of the friend's profits. In addition, the employee and his friend are subject to, among other things, criminal prosecution, as described above.

7. **Insider Reporting Requirements, Short-Swing Profits and Short Sales**

A. Reporting Obligations Under Section 16(a)--SEC Forms 3, 4 and 5

Section 16(a) of the Securities Exchange Act of 1934, as amended (the "1934 Act"), generally requires all officers (as defined in SEC Rule 16a-1(f))[1] ("officers"), directors and 10% stockholders, within ten (10) days after the insider becomes an officer, director or 10% stockholder, to file with the SEC an "Initial Statement of Beneficial Ownership of Securities" on SEC Form 3 ("Form 3") listing the amount of

[1] SEC Rule 16a-1(f) defines this term to "mean an issuer's president, principal financial officer, or principal accounting officer (or, if there is no such accounting officer, the controller), any vice-president of the issuer in charge of a principal business unit, division or function (such as sales, administration or finance), any other officer who performs a policy-making function, or any other person who performs similar policy-making functions for the issuer. Officers of the issuer's parent(s) or subsidiaries shall be deemed officers of the issuer if they perform such policy-making functions for the issuer."

Stock, stock awards and warrants which the insider beneficially owns. Following the initial filing on Form 3, every change in the beneficial ownership of the Company's Stock, stock awards and warrants must be reported on SEC Form 4 ("Form 4") within two (2) days after the date on which such change occurs or in certain cases on SEC Form 5 ("Form 5") within forty-five (45) days after fiscal year end (September 30). Form 4s must be filed even if, as a result of balancing transactions, there has been no net change in holdings.

Special rules apply in certain situations. If an officer or director purchases or sells any Stock within six (6) months after his or her termination from such position, the transaction must be reported on Form 4 if he or she made any opposite way purchase or sale within the preceding six (6) months and prior to termination.

B. Recovery of Profits Under Section 16(b)

For the purpose of preventing the unfair use of information which may have been obtained by an insider, any profits realized by any officer, director or 10% stockholder from any "purchase" and "sale" of Stock during a six (6) month period, so called "short-swing profits," may be recovered by the Company. When such a purchase and sale occurs, good faith is no defense. The insider is liable even if compelled to sell for personal reasons, and even if the sale takes place after full disclosure and without the use of any inside information.

The liability of an insider under Section 16(b) of the 1934 Act is to the Company itself. The Company, however, cannot waive its right to short-swing profits, and any Company stockholder can bring suit in the name of the Company. In this connection it must be remembered that reports of ownership filed with the SEC on Form 3, Form 4 or Form 5 pursuant to Section 16(a) (discussed above) are readily available to the public, and certain attorneys carefully monitor these reports for potential Section 16(b) violations. In addition, liabilities under Section 16(b) may require separate disclosure in the Company's annual report to the SEC on Form 10-K or its proxy statement for its annual meeting of stockholders. No suit may be brought more than two (2) years after the date the profit was realized. However, if the insider fails to file a report of the transaction under Section 16(a), as required, the two (2) year limitation period does not begin to run until after the transactions giving rise to the profit have been disclosed. Failure to report transactions and late filing of reports require separate disclosure in the Company's proxy
statements.

Officers and directors must consult the attached "Short-Swing Profit Rule Section 16(b) Checklist" attached hereto as Attachment A in addition to consulting with the Insider Trading Program Manager prior to engaging in any transactions involving the Company's securities, including without limitation, the Company's Stock, stock awards or warrants.

C. Short Sales Prohibited Under Section 16(c)

Section 16(c) of the 1934 Act prohibits insiders from making short sales of the Company's Stock, i.e., sales of shares which the insider does not own at the time of sale or sales of Stock against which the insider does not deliver the shares within twenty (20) days after the sale. Under certain circumstances, the purchase or sale of put or call options, or the writing of such options, can result in a violation of Section 16(c). Insiders violating Section 16(c) face criminal liability.

The Insider Trading Program Manager must be consulted if you have any questions regarding reporting obligations, short-swing profits or short sales under Section 16.

8. **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 and employee is required to follow these procedures.

1. **Identifying Material, Non-public Information**

Prior to directly or indirectly trading any security of the Company, every officer, every director and the employees listed on Schedule 1 (as amended from time to time by the Insider Trading Program Manager) is required to contact the Insider Trading Program Manager (as part of the pre-clearance procedure discussed below in Section D) and make an initial determination whether the Company and/or such officer, director or employee listed on Schedule 1 (as amended from time to time) is in possession of material, non-public information relating to such security. In making such assessment, the explanations of "material" and "non-public" information set forth above should be of assistance. If after consulting with the Insider Trading Program Manager it is determined that the Company and/or such officer, director or employee is in possession of material, non-public information, there may be no trading of such security.

2. **Information Relating to the Company**

A. 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 and employees 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 (absent prior written approval by the Insider Trading Program Manager and execution of an appropriate confidentiality agreement) or to anyone within the Company on an other than need-to-know basis.

In communicating material, non-public information to employees of the Company, all officers, directors and employees 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.

B. Inquiries From Third Parties

Inquiries from third parties, such as industry analysts or members of the media, about the Company should be directed to the Insider Trading Program Manager.

3. **Limitations on Access to the Company Information**

The following procedures are designed to maintain confidentiality with respect to the Company's business operations and activities.

A. All officers, directors and employees 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 restricted or conducted in such a manner as to prevent access by unauthorized persons;
- 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, nonpublic 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.

B. Personnel involved with material, non-public information, to the extent feasible, should conduct their business and activities in areas separate from other Company activities.

4. **Pre-Clearance of Trades by Officers, Directors and Certain Employees**

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 the Company securities, all transactions in Company securities (including without limitation, acquisitions and dispositions of the Company's Stock, the sale of the Company's Stock issued upon exercise of stock options and the settlement of an restricted stock units or performance share awards) (including same-day broker assisted sales) by all officers, all directors and the employees listed on Schedule 1 (as amended from time to time by the Insider Trading Program Manager) must be precleared by the Insider Trading Program Manager (or the Chief Executive Officer in the event the preclearance request pertains to a transaction involving Company securities owned by the Insider Trading Program Manager). Additionally, except for the exercise of options for cash (but not the sale of such shares), the granting of stock awards, and the receipt or purchase of shares in settlement of any restricted stock unit agreement, performance share agreement or stock appreciation rights agreement (but not the sale of any such shares, including the payment of any associated taxes through the surrender or sale of shares received from such stock award (or the right to receive such shares)), neither the Company nor any of its officers, directors or employees may transact in any securities of the Company during the Black-Out Period, including gifts as described in Section II.4. above. Also, please consult the "Insider Trading Reminders" attached hereto as Attachment B.

5. **Avoidance of Certain Aggressive or Speculative Trading**

Officers, directors and employees and their respective family members (including spouses, minor children or any other family members living in the same household), should ordinarily not directly or indirectly participate in transactions in the Company's securities involving trading activities which by

their aggressive or speculative nature may give rise to an appearance of impropriety. Such activities would include the purchase of put or call options, or the writing of such options.

V. RULE 10B5-1 TRADING PLANS

1. Overview

SEC Rule 10b5-1 ("Rule 10b5-1") will protect directors, officers and employees 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 and in accordance with the terms of Rule 10b5-1 of the 1934 Act and all applicable state laws and shall be exempt from the trading restrictions set forth in this Program. The initiation of, and any amendment (but not a revocation or termination) of, any such Trading Plan will be deemed to be a transaction in the Company's securities and such initiation or amendment is subject to all limitations and prohibitions of transactions involving the Company's securities. To meet the exemption described above, each such Trading Plan, and any amendment, revocation or termination thereof, must (1) comply with the requirements of Rule 10b5-1, including without limitation, the ongoing requirement that the person who enters into the Trading Plan must act in good faith with respect to such Trading Plan (and in the case of directors and officers, the certification that the director or officer, as the case may be, at the time of the adoption of the Trading Plan, is not aware of material, nonpublic information about the Company or its securities and is adopting the Trading Plan in good faith and not as part of a plan or scheme to evade the prohibitions of 1934 Act Section 10(b) and SEC Rule 10b-5), (2) comply with any Rule 10b5-1 guidelines or requirements adopted from time to time by the Company, and (3) be pre-approved by the Insider Trading Program Manager. Where a Trading Plan pertains to trades involving Company securities owned by the Insider Trading Program Manager, all references to "Insider Trading Program Manager" in this Section V shall be replaced with "Chief Executive Officer".

Rule 10b5-1 presents an opportunity for insiders to establish arrangements to sell (or purchase) the Company's Stock without the restrictions of windows and black-out periods even when there is undisclosed material information. A Trading Plan 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 and employee may enter into a Trading Plan only when he or she is not in possession of material, nonpublic information, and only during a trading window period outside of the Black-Out Period. In addition, a required initial Cooling-off Period (as defined below) must be observed before executing the first trade under such Trading Plan. Except for one later-commencing Trading Plan under which trading is not authorized to begin until after all trades under the earlier commencing Trading Plan are completed or expired without execution (subject to the proviso contained in Rule 10b5-1(c)(1)(ii)(D)(2)) or as otherwise permitted under Rule 10b5-1(c)(1)(ii)(D), a director, officer or employee who enters into a Trading Plan may not have another outstanding Trading Plan (and may not subsequently enter into any additional Trading Plans) for purchases or sales of any class of securities of the Company on the open market (i.e., Trading Plans cannot "overlap"). Additionally, a director, officer or employee may not enter into a Trading Plan designed to effect the open-market purchase or sale of the total amount of securities as a single transaction (i.e., a "single-trade plan") more than once during any consecutive 12-month period. Although transactions effected under a Trading Plan will not require further pre-clearance at the time of the trade, any transaction (including the quantity and price) made pursuant to a Trading Plan of a Section 16 reporting person 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. **No director, officer or employee who enters into a Trading Plan may purchase or sell the Company's Stock outside such Trading Plan as long as that Trading Plan is in place.** For purposes of this Policy, the term "Cooling-off Period" means either, in the case of directors and officers, the later of (1) ninety (90) days following the establishment of a Trading Plan or (2) two business days following the disclosure of the Company's financial results in a Form 10-Q or Form 10-K for the fiscal quarter in which the Trading Plan was adopted (subject to a maximum of one hundred twenty (120) days after the establishment of the Trading Plan); or, in the case of all other employees, ninety (90) days following the establishment of a Trading Plan.

From time to time, for legal or other reasons, the Insider Trading Program Manager may direct that purchases and sales pursuant to any Trading Plan be suspended or discontinued. Failure to discontinue purchases and sales as directed shall constitute a violation of the terms of this Section V and result in a loss of the exemption set forth herein.

Officers, directors and employees may adopt Trading Plans with brokers that outline a pre-set plan for trading of the Company's Stock. Trading Plans are to be implemented only during open window periods and when the individual is not aware of any material non-public information. Trades pursuant to a Trading Plan may occur at any time. Please review the following description of how a Trading Plan works.

Pursuant to Rule 10b5-1, assuming the individual continues to act in good faith with respect to the Trading Plan, an individual's purchase or sale of securities will not be "on the basis of" material non-public information if:

- First, before becoming aware of the information, the individual enters into a binding contract to purchase or sell the securities, provides instructions to another person to sell the securities or adopts a written plan for trading the securities (i.e., the Trading Plan).
- Second, the Trading Plan must:
  - specify the amount of securities to be purchased or sold, the price at which the securities are to be purchased or sold and the date on which the securities are to be purchased or sold;
  - 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 or sale of the Company's Stock under the Trading Plan in question.
- Third, the purchase or sale 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.

2. **Termination/Amendments to Trading Plans**

Termination of a Trading Plan should occur only in unusual circumstances, and effectiveness of any revocation of a Trading Plan will be subject to the prior review and written approval of the Insider Trading Program Manager. Termination is effected upon written notice to the broker.

However, if the individual terminates the Trading Plan, then the individual must agree not to trade under a successor Trading Plan for the applicable Cooling-off Period after termination of the predecessor Trading Plan.

Under certain circumstances, a Trading Plan must be terminated. 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. Accordingly, Trading Plans should provide that a Trading Plan terminates upon 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. Either the Insider Trading Program Manager 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 termination.

Amendments to Trading Plans will not be allowed.

3. **Discretionary Plans**

Discretionary Trading Plans, where the discretion or control over trading is transferred to a broker, are permitted if pre-approved by the Insider Trading Program Manager.

The Insider Trading Program Manager must pre-approve any Trading Plan, arrangement or trading instructions, etc., involving potential sales or purchases of the Company's Stock or option exercises, including but not limited to, blind trusts, limit orders or hedging strategies. 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.

4. **Reporting (if required)**

SEC Form 144 ("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 Rule 10b5-1." For Section 16 reporting persons, Form 4s should be filed before the end of the second (2nd) trading 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 (3rd) trading day following the trade date. Similarly, the appropriate box should be checked at the top of the first page of the Form 4 to indicate the trades are made pursuant to a Trading Plan.

5. **Stock Awards**

Cash exercise of options currently can be executed at any time. Same day broker-assisted sales of exercised options and vested stock awards (such as restricted stock units) are subject to trading windows. However, the Company will permit same day broker-assisted sales under Trading Plans.

The Trading Plans do not exempt the individuals from complying with the Section 16 six (6) month short-swing profit rules or liability.

6. **Quarterly Disclosures; Public Announcements**

The Company shall disclose information regarding Rule 10b5-1 Plans adopted by directors and officers as required by Item 408(a) of Regulation S-K and 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.

7. **Pledging the Company's Stock to Secure Margin of Other Loans**

The Company does not permit officers or directors to pledge the Company's Stock as collateral to secure loans. Such pledges also cannot be carried out through a Trading Plan.

8. **Put and Call Options and other Hedging Transactions**

Put and call options and other hedging transactions will not be permitted under a Trading Plan. In fact, such transactions outside of a Trading Plan may destroy the protection afforded by a Trading Plan.

VI. EXECUTION AND RETURN OF CERTIFICATION OF COMPLIANCE

After reading this Program statement all officers, directors and employees should execute and return to the individual noted therein the applicable Certification of Compliance form attached hereto as Attachment C or Attachment D.

* * * * *

Attachment A

SHORT-SWING PROFIT RULE SECTION 16(b) CHECKLIST

Note: ANY combination of PURCHASE AND SALE or SALE AND PURCHASE within six (6) months of each other results in a violation of Section 16(b), and the "profit" must be recovered by the Company. It makes no difference how long the shares being sold have been held--or that you are an insider for only one of the two matching transactions. The highest priced sale will be matched with the lowest priced purchase within the six (6) month period.

SALES

If a sale is to be made by an officer, director or 10% stockholder (or any family member living in the same household):

1. Have there been any purchases by the insider (or family members living in the same household) within the past six (6) months?

2. Are any purchases anticipated or required within the next six (6) months?

3. Has a Form 4 been prepared?

Note: If a sale is to be made by an affiliate of the Company and unregistered stock is to be sold, has a Form 144 been prepared and has the broker been reminded to sell pursuant to Rule 144?

PURCHASES

If a purchase for stock is to be made:

1. Have there been any sales by the insider (or family members living in the same household) within the past six (6) months?

2. Are any sales anticipated or required within the next six (6) months (such as tax-related or year-end transactions)?

3. Has a Form 4 been prepared?

BEFORE PROCEEDING WITH A PURCHASE OR SALE, CONSIDER WHETHER YOU ARE AWARE OF MATERIAL, NON-PUBLIC INFORMATION WHICH COULD AFFECT THE PRICE OF THE STOCK.

Attachment B

INSIDER TRADING REMINDERS

Before engaging in any transaction in the Company's securities, please read the following:

Both the federal securities laws and the Company's Program prohibit transactions in the Company's securities at a time when you may be in possession of material information about the Company which has not been publicly disclosed. This also applies to members of your household as well as all others whose transactions may be attributable to you.

Material information, in short, is any information which could affect the price of the securities. Either positive or negative information may be material. Once a public announcement has been made, you should wait until the information has been made available to the public for at least two (2) full trading days before engaging in any transaction.

Neither the Company nor any of its officers, directors or employees may trade in any securities of the Company during the period beginning two (2) weeks before the end of any fiscal quarter of the Company and ending on the close of business on the second (2nd) full trading day after the public release of earnings data for such quarter whether or not the Company or any of its officers, directors or employees is in possession of material, non-public information. Important: All transactions by officers, directors and employees listed on Schedule 1 must be precleared with the Insider Trading Program Manager (or the Chief Executive Officer in the event the preclearance request pertains to a transaction involving Company securities owned by the Insider Trading Program Manager).

For further information and guidance, please refer to our Insider Trading Compliance Program and do not hesitate to contact the Corporate Secretary.

ALL TRANSACTIONS IN TWIST BIOSCIENCE CORPORATION SECURITIES BY OFFICERS, DIRECTORS AND EMPLOYEES LISTED ON SCHEDULE 1 MUST BE PRECLEARED BY CONTACTING THE INSIDER TRADING PROGRAM MANAGER (OR CHIEF EXECUTIVE OFFICER IN THE EVENT THE PRECLEARANCE REQUEST PERTAINS TO A TRANSACTION INVOLVING COMPANY SECURITIES OWNED BY THE INSIDER TRADING PROGRAM MANAGER).

Attachment C
Non-employee Directors

TO: Insider Trading Program Manager
FROM: _____

RE: INSIDER TRADING COMPLIANCE PROGRAM OF Twist Bioscience Corporation

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 Twist Bioscience Corporation, to comply fully with the policies and procedures contained therein.

I hereby certify, to the best of my knowledge, that during the calendar year ending December 31, _____, I have not violated the policies and procedures set forth in the above-referenced Insider Trading Compliance Program. I agree that I will be subject to sanctions imposed by the Company, in its discretion, for violation of the above-referenced Insider Trading Compliance Program and will continue to comply with, and remain subject to, such policies and procedures as set forth therein. I acknowledge and agree that the Company may give stop-transfer and other instructions to the Company's transfer agent against the transfer of the Company's securities as necessary to ensure compliance with the above-referenced Insider Trading Compliance Program.

_____ _____
SIGNATURE DATE

_____
TITLE

Attachment D
Officers, Employee Directors & Employees

CERTIFICATION OF COMPLIANCE

RETURN BY _____, ____

TO: Insider Trading Program Manager

FROM: _____

RE: INSIDER TRADING COMPLIANCE PROGRAM OF Twist Bioscience Corporation

I have received, reviewed and understand the above-referenced Insider Trading Compliance Program and hereby undertake, as a condition to my present and continued employment at Twist Bioscience Corporation, to comply fully with the policies and procedures contained therein.

I hereby certify, to the best of my knowledge, that during the calendar year ending December 31, ____, I have not violated the policies and procedures set forth in the above-referenced Insider Trading Compliance Program. I agree that I will be subject to sanctions imposed by the Company, in its discretion, for violation of the above-referenced Insider Trading Compliance Program and will continue to comply with, and remain subject to, such policies and procedures as set forth therein. I acknowledge and agree that the Company may give stop-transfer and other instructions to the Company's transfer agent against the transfer of the Company's securities as necessary to ensure compliance with the above-referenced Insider Trading Compliance Program.

_____ _____
SIGNATURE DATE

_____
TITLE

Exhibit 21.1

Twist Bioscience Corporation Subsidiaries

Twist Bioscience Corporation has the following subsidiaries:

1. Twist Bioscience Worldwide, a Cayman Islands exempted company.

2. Genome Compiler Corporation, a Delaware corporation, which itself owns Twist Bioscience Israel Ltd. (formerly "Genome Compiler Israel Ltd."), an Israel limited liability company.

3. Twist Bio Computing, LLC, a Delaware limited liability company.

4. Twist Pharmaceutical Solutions, LLC, a Delaware limited liability company.

5. Twist Bioscience Singapore PTE. LTD., a Singapore company, which itself owns Twist Bioscience (China) Limited, a Chinese limited liability company.

6. iGenomX International Genomics, LLC, a Delaware limited liability company.

7. Twist Bioscience Netherlands B.V., a private limited company incorporated under Dutch law, which itself owns each of Twist Bioscience UK Ltd, a private limited company incorporated under the laws of England and Wales and Twist Bioscience Germany GmbH, a German limited liability company.

8. AbX Biologics, Inc., a Delaware corporation.

9. Twist Bioscience Japan K.K., a Japanese stock company.

Exhibit 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in the following Registration Statements:

(1) Registration Statements on Form S-3 (Nos. 333-238906, 333-234538, and 333-272428) of Twist Bioscience Corporation,
(2) Registration Statement on Form S-8 (333-228123) relating to the 2018 Equity Incentive Plan and 2013 Stock Plan of Twist Bioscience Corporation,
(3) Registration Statement on Form S-8 (333-228547) relating to the 2018 Employee Stock Purchase Plan of Twist Bioscience Corporation,
(4) Registration Statements on Form S-8 (Nos. 333-236373, 333-258639, 333-268573, and 333-275690) relating to the 2018 Equity Incentive Plan and 2018 Employee Stock Purchase Plan of Twist Bioscience Corporation, and
(5) Registration Statement on Form S-8 (333-274202) relating to the Inducement Equity Incentive Plan of Twist Bioscience Corporation;

of our reports dated November 18, 2024, with respect to the consolidated financial statements of Twist Bioscience Corporation and the effectiveness of internal control over financial reporting of Twist Bioscience Corporation included in this Annual Report (Form 10-K) of Twist Bioscience Corporation for the year ended September 30, 2024.

/s/ Ernst & Young LLP

San Mateo, California
November 18, 2024

Exhibit 31.1

Certification of Principal Executive Officer
pursuant to
Exchange Act Rules 13a-14(a) and 15d-14(a),
as adopted pursuant to
Section 302 of the Sarbanes-Oxley Act of 2002

I, Emily M. Leproust, certify that:

1. I have reviewed this Annual Report on Form 10-K of Twist Bioscience Corporation for the year ended September 30, 2024;
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 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.

/s/ Emily M. Leproust
Emily M. Leproust
Chief Executive Officer
(Principal Executive Officer)

Date: November 18, 2024

Exhibit 31.2

Certification of Principal Financial Officer
pursuant to
Exchange Act Rules 13a-14(a) and 15d-14(a),
as adopted pursuant to
Section 302 of the Sarbanes-Oxley Act of 2002

I, Adam Laponis, certify that:

1. I have reviewed this Annual Report on Form 10-K of Twist Bioscience Corporation for the year ended September 30, 2024;
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 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.

/s/ Adam Laponis
Adam Laponis
Chief Financial Officer

Date: November 18, 2024

Exhibit 32.1

CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER
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 Twist Bioscience Corporation (the "Company") on Form 10-K for the year ended September 30, 2024, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Emily M. Leproust, Chief Executive Officer of the Company, certify, pursuant to 18 U.S.C. § 1350, as adopted pursuant to §906 of the Sarbanes-Oxley Act of 2002, that:

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

Date: November 18, 2024

/s/ Emily M. Leproust
Emily M. Leproust
Chief Executive Officer
(Principal Executive Officer)

Exhibit 32.2

CERTIFICATION OF PRINCIPAL FINANCIAL OFFICER
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 Twist Bioscience Corporation (the "Company") on Form 10-K for the year ended September 30, 2024, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Adam Laponis, Chief Financial Officer of the Company, certify, pursuant to 18 U.S.C. § 1350, as adopted pursuant to §906 of the Sarbanes-Oxley Act of 2002, that:

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

Date: November 18, 2024

/s/ Adam Laponis
Adam Laponis
Chief Financial Officer

Exhibit 97.1

TWIST BIOSCIENCE CORPORATION

COMPENSATION RECOVERY POLICY

(Adopted and approved on November 2, 2023
and effective as of October 2, 2023)

1. Purpose

Twist Bioscience Corporation (collectively with its subsidiaries, the "***Company***") is committed to promoting high standards of honest and ethical business conduct and compliance with applicable laws, rules and regulations. As part of this commitment, the Company has adopted this Compensation Recovery Policy (this "***Policy***"). This Policy is designed to comply with Section 10D of the Securities Exchange Act of 1934, as amended (the "***Exchange Act***") and explains when the Company will be required to seek recovery of Recoverable Incentive Compensation Received by a Covered Person. Please refer to Exhibit A attached hereto (the "***Definitions Exhibit***") for the definitions of capitalized terms used throughout this Policy.

2. Miscalculation of Financial Reporting Measure Results

In the event of a Restatement, the Company will seek to recover, reasonably promptly, all Recoverable Incentive Compensation from a Covered Person. Such recovery will be made without regard to any individual knowledge or responsibility related to the Restatement. Notwithstanding the foregoing, if the Company is required to undertake a Restatement, the Company will not be required to recover the Recoverable Incentive Compensation if the Compensation Committee determines it Impracticable to do so, after exercising a normal due process review of all the relevant facts and circumstances.

3. Other Actions

The Compensation Committee may, subject to applicable law, seek recovery in the manner it chooses, including by seeking reimbursement from the Covered Person of all or part of the compensation awarded or paid, by electing to withhold unpaid compensation, by set-off, or by rescinding or canceling unvested stock.

In the reasonable exercise of its business judgment under this Policy, the Compensation Committee may in its sole discretion determine whether and to what extent additional action is appropriate to address the circumstances surrounding a Restatement to minimize the likelihood of any recurrence and to impose such other discipline as it deems appropriate.

4. No Indemnification or Reimbursement

Notwithstanding the terms of any other policy, program, agreement or arrangement, in no event will the Company or any of its affiliates indemnify or reimburse a Covered Person for any loss under this Policy and in no event will the Company or any of its affiliates pay premiums on any insurance policy that would cover a Covered Person's potential obligations with respect to Recoverable Incentive Compensation under this Policy.

5. Administration of Policy

The Compensation Committee will have full authority to administer this Policy. The Compensation Committee will, subject to the provisions of this Policy and Rule 10D-1 of the Exchange Act, and the

Company's applicable exchange listing standards, make such determinations and interpretations and take such actions in connection with this Policy as it deems necessary, appropriate or advisable. All determinations and interpretations made by the Compensation Committee will be final, binding and conclusive.

6. Other Claims and Rights

The remedies under this Policy are in addition to, and not in lieu of, any legal and equitable claims the Company or any of its affiliates may have or any actions that may be imposed by law enforcement agencies, regulators, administrative bodies, or other authorities. Further, the exercise by the Compensation Committee of any rights pursuant to this Policy will not impact any other rights that the Company or any of its affiliates may have with respect to any Covered Person subject to this Policy.

7. Acknowledgement by Covered Persons; Condition to Eligibility for Incentive Compensation

The Company will provide notice and seek acknowledgement of this Policy from each Covered Person, provided that the failure to provide such notice or obtain such acknowledgement will have no impact on the applicability or enforceability of this Policy. After the Effective Date, the Company must be in receipt of a Covered Person's acknowledgement as a condition to such Covered Person's eligibility to receive Incentive Compensation. All Incentive Compensation subject to this Policy will not be earned, even if already paid, until the Policy ceases to apply to such Incentive Compensation and any other vesting conditions applicable to such Incentive Compensation are satisfied.

8. Amendment; Termination

The Board or the Compensation Committee may amend or terminate this Policy at any time.

9. Effectiveness

Except as otherwise determined in writing by the Compensation Committee, this Policy will apply to any Incentive Compensation that is Received by a Covered Person on or after the Effective Date. This Policy will survive and continue notwithstanding any termination of a Covered Person's employment with the Company and its affiliates.

10. Successors

This Policy shall be binding and enforceable against all Covered Persons and their successors, beneficiaries, heirs, executors, administrators, or other legal representatives.

Exhibit A

TWIST BIOSCIENCE CORPORATION

COMPENSATION RECOVERY POLICY

DEFINITIONS EXHIBIT

"***Applicable Period***" means the three completed fiscal years of the Company immediately preceding the earlier of (i) the date the Board, a committee of the Board, or the officer or officers of the Company authorized to take such action if Board action is not required, concludes (or reasonably should have concluded) that a Restatement is required or (ii) the date a court, regulator, or other legally authorized body directs the Company to prepare a Restatement. The "Applicable Period" also includes any transition period (that results from a change in the Company's fiscal year) within or immediately following the three completed fiscal years identified in the preceding sentence.

"***Board***" means the Board of Directors of the Company.

"***Compensation Committee***" means the Company's committee of independent directors responsible for executive compensation decisions, or in the absence of such a committee, a majority of the independent directors serving on the Board.

"***Covered Person***" means any person who is, or was at any time, during the Applicable Period, an Executive Officer of the Company. For the avoidance of doubt, a Covered Person may include a former Executive Officer who voluntarily or involuntarily terminated employment with the Company, retired, or transitioned to a non-Executive Officer employee role (including after serving as an Executive Officer in an interim capacity) during the Applicable Period.

"***Effective Date***" means October 2, 2023.

"***Executive Officer***" means the Company's president, principal executive officer, principal financial officer, principal accounting officer (or if there is no such accounting officer, the controller), any vice-president in charge of a principal business unit, division, or function (such as sales, administration, or finance), any other officer who performs a policy-making function, or any other person (including an officer of the Company's parent(s) or subsidiaries) who performs similar policy-making functions for the Company.

"***Financial Reporting Measure***" means a measure that is determined and presented in accordance with the accounting principles used in preparing the Company's financial statements (including, but not limited to, "non-GAAP" financial measures, such as those appearing in the Company's earnings releases or Management Discussion and Analysis), and any measure that is derived wholly or in part from such measure. Stock price and total shareholder return (and any measures derived wholly or in part therefrom) shall be considered Financial Reporting Measures.

"***Impracticable.***" The Compensation Committee may determine in good faith that recovery of Recoverable Incentive Compensation is "Impracticable" if: (i) pursuing such recovery would violate home country law of the jurisdiction of incorporation of the Company where that law was adopted prior to November 28, 2022 and the Company provides an opinion of home country counsel to that effect acceptable to the Company's applicable listing exchange; (ii) the direct expense paid to a third party to assist in enforcing this Policy would exceed the Recoverable Incentive Compensation and the Company has (A) made a reasonable attempt to recover such amounts and (B) provided documentation of such attempts to recover to the Company's applicable listing exchange; or (iii) recovery would likely cause an

otherwise tax-qualified retirement plan, under which benefits are broadly available to employees of the Company, to fail to meet the requirements of Section 401(a)(13) or Section 411(a) of the Internal Revenue Code of 1986, as amended.

"***Incentive Compensation***" means any compensation that is granted, earned, or vested based wholly or in part upon the attainment of a Financial Reporting Measure. Incentive Compensation does not include any base salaries (except with respect to any salary increases earned wholly or in part based on the attainment of a Financial Reporting Measure performance goal); bonuses paid solely at the discretion of the Compensation Committee or Board that are not paid from a "bonus pool" that is determined by satisfying a Financial Reporting Measure performance goal; bonuses paid solely upon satisfying one or more subjective standards and/or completion of a specified employment period; non-equity incentive plan awards earned solely upon satisfying one or more strategic measures or operational measures; and equity awards that vest solely based on the passage of time and/or attaining one or more non-Financial Reporting Measures.

"***Received.***" Incentive Compensation is deemed "Received" in the Company's fiscal period during which the Financial Reporting Measure specified in the Incentive Compensation award is attained, even if the payment or grant of the Incentive Compensation occurs after the end of that period.

"***Recoverable Incentive Compensation***" means the amount of any Incentive Compensation (calculated on a pre-tax basis) Received by a Covered Person during the Applicable Period that is in excess of the amount that otherwise would have been Received if the calculation were based on the Restatement. For the avoidance of doubt Recoverable Incentive Compensation does not include any Incentive Compensation Received by a person (i) before such person began service in a position or capacity meeting the definition of an Executive Officer, (ii) who did not serve as an Executive Officer at any time during the performance period for that Incentive Compensation, or (iii) during any period the Company did not have a class of its securities listed on a national securities exchange or a national securities association. For Incentive Compensation based on (or derived from) stock price or total shareholder return where the amount of Recoverable Incentive Compensation is not subject to mathematical recalculation directly from the information in the applicable Restatement, the amount will be determined by the Compensation Committee based on a reasonable estimate of the effect of the Restatement on the stock price or total shareholder return upon which the Incentive Compensation was Received (in which case, the Company will maintain documentation of such determination of that reasonable estimate and provide such documentation to the Company's applicable listing exchange).

"***Restatement***" means an accounting restatement of any of the Company's financial statements filed with the Securities and Exchange Commission under the Exchange Act, or the Securities Act of 1933, as amended, due to the Company's material noncompliance with any financial reporting requirement under U.S. securities laws, regardless of whether the Company or Covered Person misconduct was the cause for such restatement. "Restatement" includes any required accounting restatement to correct an error in previously issued financial statements that is material to the previously issued financial statements (commonly referred to as "Big R" restatements), or that would result in a material misstatement if the error were corrected in the current period or left uncorrected in the current period (commonly referred to as "little r" restatements).

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SOUTH SAN FRANCISCO, CA 94080
TWISTBIOSCIENCE.COM

Executive Officers

Emily M. Leproust, Ph.D.
Chief Executive Officer and Chair of the Board

Patrick Finn, Ph.D.
President and Chief Operating Officer

Adam Laponis
Chief Financial Officer

Dennis Cho
Chief Legal Officer and Corporate Secretary

Paula Green
Senior Vice President of Human Resources

Robert Werner
Chief Accounting Officer

Board of Directors

Emily M. Leproust, Ph.D.
Chief Executive Officer; Chair of the Board

Nelson C. Chan
Member of the Audit and Risk Committee and Nominating and Corporate Governance Committee; Lead Director for Corporate Responsibility

Robert Chess
Lead Independent Director; Chair of the Nominating and Corporate Governance Committee; Member of the Compensation Committee

Keith Crandell
Managing Director at ARCH Venture Management, L.P.; Member of the Compensation Committee and Nominating and Corporate Governance Committee

Jan Johannessen
Advisor at iGlobe Partners; Chair of the Audit and Risk Committee; Member of the Nominating and Corporate Governance Committee

Xiaoying Mai
Executive Director at GF Investments (Hong Kong); Member of the Audit and Risk Committee

Robert Ragusa
Chief Executive Officer at GRAIL, LLC; Member of the Audit and Risk Committee and Compensation Committee

Melissa A. Starovasnik, Ph.D.
Chair of the Compensation Committee