
REPLIGEN
INSPIRING ADVANCES IN BIOPROCESSING
2024 ANNUAL REPORT

Innovative
Visionary
Agile
Collaborative
Supportive
Experienced

At the entryway to our brand new Repligen Training and Innovation Center (RTIC) in Waltham, are these bold words that exemplify Repligen's customer centricity. In 2024, we continued to be recognized as the most ***innovative*** company in the bioprocessing space, with our ***supportive*** team of over 1,700 employees worldwide taking a ***collaborative*** approach to overcoming our customers' complex biologics manufacturing challenges. By staying ***agile*** in a dynamic environment, we continued in 2024 to bring disruptive new technologies to market, execute on M&A and achieve our financial targets. Over the past year, we onboarded several ***experienced*** leaders from across the industry, bringing a collective ***visionary*** mindset to uphold our purpose of ***"inspiring advances in bioprocessing".***

2024 Business HIGHLIGHTS

$634M
Total Reported Revenue

$623M
Non-COVID Related Revenue

140
Basis Point Increase in Gross Margin Compared to 2023

~80%
Share of Total Revenue from Highly Differentiated Products

20%
Share of Total Revenue from New Modalities

9
New Product Launches

M&A
Tantti Acquisition, Metenova Integration

–25%
Reduction in Overall GHG Emissions (tons CO_2e) Across Scopes 1, 2 and 3 (2023 vs. 2022)

Our mission is to inspire advances in bioprocessing as a trusted partner in the production of biologic drugs that improve human health worldwide


VISION

Dear SHAREHOLDERS

Welcome to Repligen's 2024 annual report. I am pleased to reflect with you on the achievements of the past year, as Repligen's newly appointed President and Chief Executive Officer. Since joining Repligen in October 2023 as President and Chief Commercial Officer, my alignment with the strategy and vision that Tony Hunt and the team set for Repligen was immediate, and now as CEO since September 2024, I'm excited to be leading this high-performing organization to an even more successful future.

As we outlined in our 2023 annual report, 2024 was expected to be a transition year for the company, as we overcame multiple industry headwinds and faced Repligen-specific pressures. Yet we remained confident that the capabilities of our talented team, and the differentiation of our portfolio of products, would help us to achieve our goals. I'm happy to say that we were able to do so, and I will provide specifics in this report.

At the time of this publication, we've entered 2025 encouraged that the overall bioprocessing market is returning to growth, and at Repligen, we had many reasons to be positive as we exited 2024. Reported revenue was on par with 2023 despite significant headwinds which represented 11 points of growth headwinds, and orders picked up sequentially through the year, to exit at the highest rate since early 2022. CDMOs (contract development and manufacturing organizations) and capital equipment, are areas of the industry that were slower to recover since the decline in COVID-related demand. Both rebounded as the year progressed and we finished 2024 with strong order growth from these more resistant sectors. Non-COVID related demand for consumables and from our biopharmaceutical customers (outside of emerging biotech) remained strong and steady, reaching their highest levels since 2022.

We made good progress operationally, executing on cost reduction activities and process improvements through our Repligen Performance System (RPS), and we continued to consolidate our manufacturing footprint.

When I reflect on the full year, in addition to the forward momentum of the markets and our overall performance, our team worked tirelessly to achieve the 2024 goals that we set at the start of the year.

Achieved Our 2024 Goals

Reporting against the five strategic priorities we defined for 2024:

1. We Grew Our Funnel of Opportunities

Over the last two years, we have prioritized strengthening and expanding our funnel of sales opportunities. This is an important metric that includes the likelihood of customers placing orders in the near- to mid-term. In 2024, we made excellent progress on this goal, expanding our "high probability" (50%+) opportunity funnel through the year, culminating in a fourth quarter orders at their highest levels in over two years. With this momentum, and as our funnel continues to grow, we are well positioned as we enter 2025. Our strong and experienced Sales organization – including our extended Key Account Management team – did excellent work to generate new leads and improve visibility of our entire bioprocessing technology portfolio at our Top 25 Pharmaceutical and CDMO accounts.

2. We Expanded Our Presence in New Modalities

Specific focus on new modalities is part of our growth algorithm to generate above-industry growth. In 2024, our revenues from this customer base grew low double-digit – well above market growth. While new modalities represent about 6% of the total biological drug market, this sector represented approximately 20% of our 2024 revenue, up from 18% in 2023. Growth was generated primarily from our Top 25 accounts, as their clinical programs progressed into late-stage development and commercial approvals. Over several years, we have built a robust portfolio of products well-suited for the production of new modalities (primarily gene therapy, cell therapy and mRNA-based biologics). These biologics are complex and difficult to manufacture, and our customers count on Repligen innovation to address pain points in their new modality production processes. Our strategy to develop and launch tailored solutions for the various new modalities has been very successful and with an expected growth CAGR of greater than 30% for this part of the market, we are ideally positioned to continue capturing market share.

3. We Launched Nine Innovative New Products

We strive to launch disruptive, innovative technologies for customers' unmet needs, adding differentiated products to our portfolio. In 2024, we launched a total of nine new products, keeping pace with our goal of five to ten per year. Most notable during 2024 was the May launch of our KrosFlo® RS 10 RPM™ System, the first and only single-use TFF system for benchscale GMP production, with in-line fully automated protein concentration measurement. Also notable and of strategic significance was the December launch of our AviPure® dsRNA Clear affinity resin, sold in our OPUS® pre-packed columns. This resin – using base matrix beads from our

newly acquired Tantti business – is the first and only affinity resin to remove the double-stranded RNA impurity from transcribed RNA, without the use of heat or solvents. These and other launches in 2024 represent true innovation and add to our highly differentiated portfolio. We estimate that approximately 80% of our business comes from products that are highly differentiated and help us to generate above industry growth.

See *Product Spotlights* later in this report.

4. We Integrated Metenova into Our Fluid Management Business

In 2023, we acquired magnetic mixing technology innovator Metenova AB (October 2023) to strengthen our Fluid Management offering. Metenova adds high power solutions for efficient media and buffer preparation, and low shear solutions for gentle mixing of sensitive proteins. These state-of-the-art technologies are designed to minimize product damage and improve product yield, contributing to an improved ROI for the customer. At the time of our acquisition, Metenova was preparing to enter the single-use mixing market with its MixOne platform, leveraging the success of its stainless steel (repeat-use) product lines. In 2024, we successfully integrated the Metenova team into our Fluid Management team, while our internal R&D developed complementary single-use bags to create a whole-product offering. We are preparing to formally launch the MixOne line of single-use mixers – combined with our proprietary single-use bags - in the first half of 2025.

5. We Expanded Margin and Implemented Cost Controls

Disciplined cost control was an area of focus for the organization in 2024, and our operations team did an excellent job implementing roof top consolidations and additional restructuring actions. While there is more work to be done to optimize processes and controls, the rigor added in 2024 enabled us to achieve targeted productivity gains. We finished the year with adjusted gross margin of 50.4%, an increase of 140 basis points when compared to 2023. More encouraging, our adjusted gross margin expanded a full 200 basis points when excluding the drag from lower COVID volume compared to 2023. Margin expansion continues to be a priority for the team.

In addition to executing on our 2024 strategic priorities, we also onboarded several experienced industry leaders, strengthening our organization to position us for future growth. Areas of focus include but are not limited to Quality, Service, Product Management and Sales. We believe the diversity of talent and experience Repligen has today will enable us to become further fit for growth.

A key element of success for Repligen and our stakeholders is our ability to adapt to change and navigate difficult periods of time. I'm proud to say that our employees and leaders took charge during 2024 – a transition year – strengthening our foundation for continued success.

Navigated a Transition Year for Bioprocessing

Following a challenging bioprocessing market in 2023, where Repligen saw a significant post-pandemic revenue decline of approximately 20%, we welcomed 2024 as a transition year and were able to deliver over $630 million in total revenue – a modest increase year-over-year.

Industry-wide challenges in 2024 included post-pandemic consumables destocking, capital equipment purchasing conservatism, and China headwinds. The biotech funding environment improved overall, but experienced quarterly ups and downs, and the industry was impacted by general geopolitical uncertainties. More specific to Repligen, our company navigated three primary headwinds;

1. Our Proteins franchise transitioned from third party/OEM-driven demand to a go-direct strategy, to secure a more self-dependent and exciting future for the franchise, grounded on Repligen-owned ligands and resins;
2. Our COVID-related revenue fully tapered off – from over $140 million in 2022, to $25 million in 2023, and approximately $11.5 million in 2024 – with $0 forecast in 2025; and,
3. We continued to see declines in demand from China as the country moved to greater "in China, for China" development and manufacturing.

Knowing of and relaying these headwinds as we entered 2024 allowed us to proactively execute on plans to replace the revenue lost to headwinds. This effort was successful and as a result, our underlying business more than offset the 2024 headwinds.

Underlying Business More Than Offset 2024 Headwinds

The abovementioned headwinds, which totaled over $65 million, were comprised of roughly $29 million of Proteins decline, $14 million of COVID-related revenue runoff and approximately $25 million from a softer China environment.

Looking forward, we carry fewer headwinds into 2025; ~$11.5 million of COVID-related revenue that will not repeat, and potentially higher currency impacts.

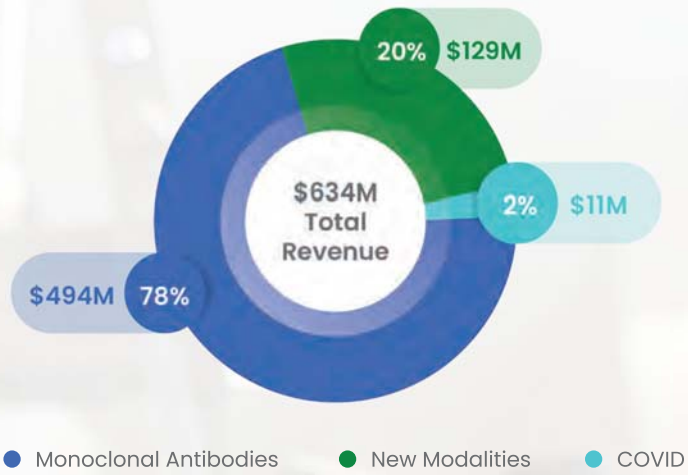
Despite these challenges, our overall revenue performance in 2024 was in line with 2023, driven by our Filtration and Analytics franchises. We also reported better than anticipated Proteins revenue, indicating that the relatively new to market Repligen-owned products in this portfolio are being adopted by customers.

$65M

Headwinds offset by underlying business

Total Revenue

Revenue by Biologic Type



Solid Revenue Performance

Overall Revenue

For the full year 2024, we reported $634 million total revenue. We are delighted with the way 2024 wrapped up, as we exited the year with fourth quarter growth of 13% year-over-year, excluding COVID. The strong finish allowed us to report full year revenue on par with 2023 despite the previously mentioned $65+ million of 2024-specific headwinds and an increase of 3% when excluding COVID.

Revenue Composition

Revenue by Biologic Type. For 2024, monoclonal antibodies again represented a significant portion of our revenue (78%), while new modalities increased to 20%, as our products gain adoption in this growing segment. Demand for COVID-related vaccines continued to decline, and represented only 2% of our business in 2024.

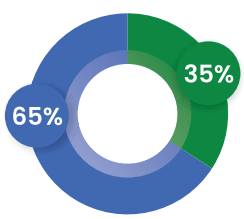
Revenue by Stage of Drug Development. Repligen is set apart from industry peers in terms of clinical to commercial revenue split. As we are "10 years young" in the bioprocessing space, we are more levered towards clinical development programs (65%) compared to commercial stage (35%), which is a benefit to our volume-related growth, as our customers' drug candidates advance through the clinical phases.

Revenue by Customer Type. Similar to previous years, biopharmaceutical developers represented the majority of our revenue (55%). Revenue from our CDMO customers increased to 30%, while OEM/Integrator revenues adjusted to 15% with the unwinding of Protein OEM agreements.

Revenue by Geography. For the year, North America represented 49%, Europe 34% and APAC 17% of total revenue. Within APAC, China declined to 3% of our revenues compared to 7% in 2023.

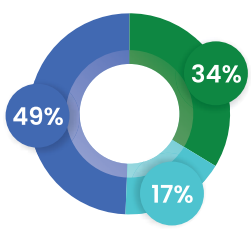
Revenue by Product Type. Part of our ongoing strategy is the build out of our systems portfolio, which can generate a flow of recurring consumables sales. In 2024, approximately 70% of our revenue came from consumables and single-use products, while 25% was derived from equipment. Additionally, service accounted for 5% of overall revenue.

Revenue by Stage of Drug Development



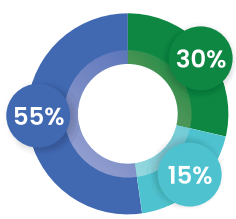
- Clinical
- Commercial

Revenue by Geography



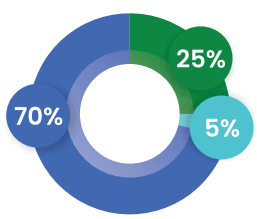
- North America
- Europe
- APAC (China 3%)

Revenue by Customer Type



- Biopharma
- CDMO
- Integrator/Other

Revenue by Product Type



- Consumables
- Equipment
- Service

Franchise Level Revenue and Orders Performance

With an improving bioprocessing backdrop for consumables and capital equipment, our Filtration and Analytics franchises benefited; both delivered revenue growth in 2024 and all franchises excluding Proteins had double-digit order growth for the year.

Filtration

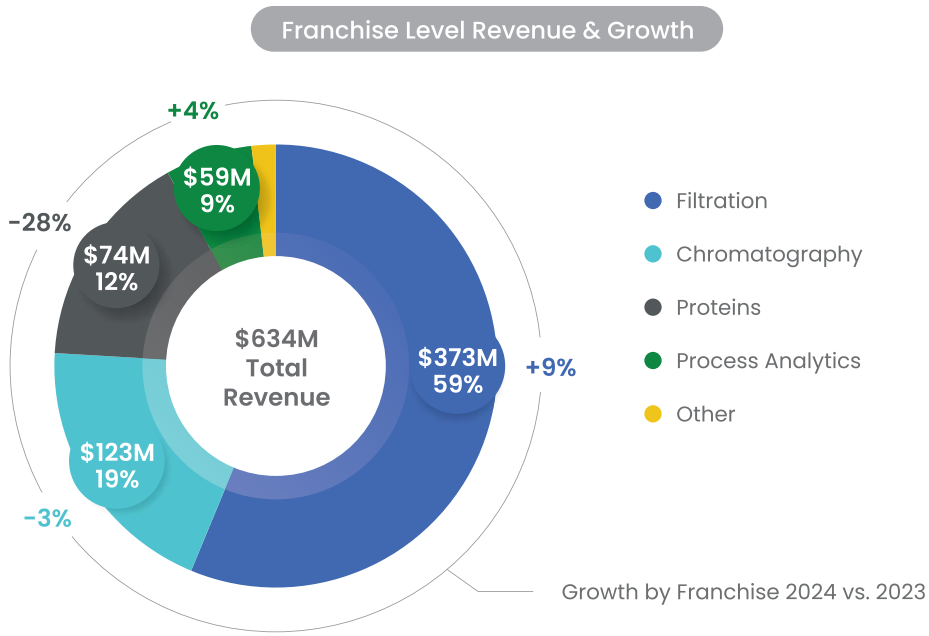
Filtration was a high performer in 2024, accounting for $373 million, or about 60% of total reported revenue. This franchise drove the majority of our total revenue growth for the year, delivering 9% reported growth and 30% growth when excluding COVID. Orders for the franchise were up over 15% for the year, versus 2023, with fourth quarter orders up nearly 30%, both sequentially and year-over-year.

Filtration remains our largest and most diverse franchise, and the strong performance in the year spanned the entire portfolio offering, with especially robust growth of greater than 50% for our XCell® ATF Systems and consumables.

A flagship product line for the company, XCell ATF has been designed in nine late-stage and commercial processes since the beginning of 2023. Among many 2024 wins, ATF was implemented into the manufacturing process for a commercial blockbuster drug. This product line provides a great example of the positive impact of production scale-up by customers, product enhancements through our R&D team (such as dual controllers), and positive brand recognition.

Chromatography

Chromatography delivered revenues of $123 million, a decline of 3% for the year, and represented approximately 20% of total revenue. The decline was impacted by a higher than typical mix of pre-packed OPUS® columns to resin sales. As part of our continued focus on margin expansion, our journey of transitioning customers to drop-ship resins that are packed into our OPUS columns is well underway. While this is a near-term headwind to OPUS revenue we expect to see a long-term benefit to gross margins for this franchise.



In 2024, revenue from XCell ATF Systems and consumables increased 50% compared to 2023. We are particularly excited by the traction for ATF, due to multiple late phase and commercial design-in wins for these Systems, which will add to our growing revenue stream for ATF consumables.

- *ATF controllers are implemented at majority of large pharma and CDMO companies*
- *9 of the Top 10 CDMOs are utilizing ATF Systems for upstream process intensification*

Case Study:
Scaleable and reproducible AAV9 Capture

In collaboration with a gene therapy manufacturing customer and using our KRM™ 10 Chromatography System, we conducted a case study where adeno-associated virus (AAV) capture purification was scaled from 1L (PD) to 500L (Pilot) scale. The results demonstrated an overall recovery increase of >13% with no increase in impurities.

- Zero dead legs via overmolded connections
- Low hold-up volumes via filter and sensor solution to replace bubble trap
- Reduced shear stress for sensitive proteins

Regarding orders, we were pleased to see Chromatography up 15% for the year. Within Chromatography, we recently launched additional KRM™ Chromatography Systems (from ARTeSYN) and expect more sales traction for these systems in 2025. To remove process scale-up challenges, the various sized KRM Systems belong to one family built off of the same design platform. The goal is to streamline scale-up from 1L/h to 3600L/h. We continue to focus on converting more of our large pharma customers to OPUS and our KRM Chromatography systems, leveraging our technology differentiation.

Process Analytics

Despite a very challenging environment for process analytics technologies (PAT) in 2024, this franchise delivered $59 million in revenue, or 4% growth for the year. Orders reached a record level, increasing 10% for the full year, compared to 2023, and up over 20% in the fourth quarter year-over-year. For customers, our analytics devices are equipment purchases – so in light of customer capital conservatism through 2024, we were thrilled to see the year-end order rebound. Demand for our KrosFlo® RPM™ Systems with integrated FlowVPX® continues to increase, as these technologies enable customers to receive real-time drug concentration measurements, mitigating operational risks associated with manual sampling and off-line analysis. We see Process Analytics as a critical franchise for the company, supporting our customers' digitization journey. We are exploring opportunities to expand our PAT offering, to include both upstream and downstream solutions.

Proteins

Lastly, for the year our Proteins franchise contributed revenues of $74 million, declining 28% but exceeding our initial expectations. 2024 was defined as a "reset" year for this part of the business, as our OEM partners are now down to minimum levels of demand. Giving us confidence in our go-direct strategy, Proteins orders outpaced revenues by 10% for the year, driven by numerous custom ligand and resin wins that we believe will be future drivers of growth for this franchise. As an example, we are already seeing healthy demand for our recently launched AVIPure® dsRNA Clear resin.

We believe we are well positioned on our path back to our historical double-digit organic revenue growth (pre-pandemic), and look to our order trends in the second half of 2024 as positive indicators for Repligen.

Favorable Order Trends to Close out the Year

Order improvement throughout the year was a bright spot, as all franchises aside from Proteins returned double-digit order growth.

The beginning of 2024 was met with continued capital conservatism by our large pharma customers, as they worked to rationalize their pipelines and clinical activity. However, as the year progressed, our funnel of opportunities for capital equipment expanded and our second half of 2024 equipment orders were 25% higher than the first half. This in part reflects our success implementing XCell® ATF controllers at a majority of pharma and CDMO companies, as well as platform wins for our KrosFlo® TFF filtration and KRM® Chromatography systems.

Overall, orders grew 10% in the second half of 2024 versus the first half, with fourth quarter being the highest order intake quarter since Q2 2022, driving overall order growth of 9% for the year. Demand for consumable was consistent throughout the year and reached a record level in the fourth quarter when excluding COVID.

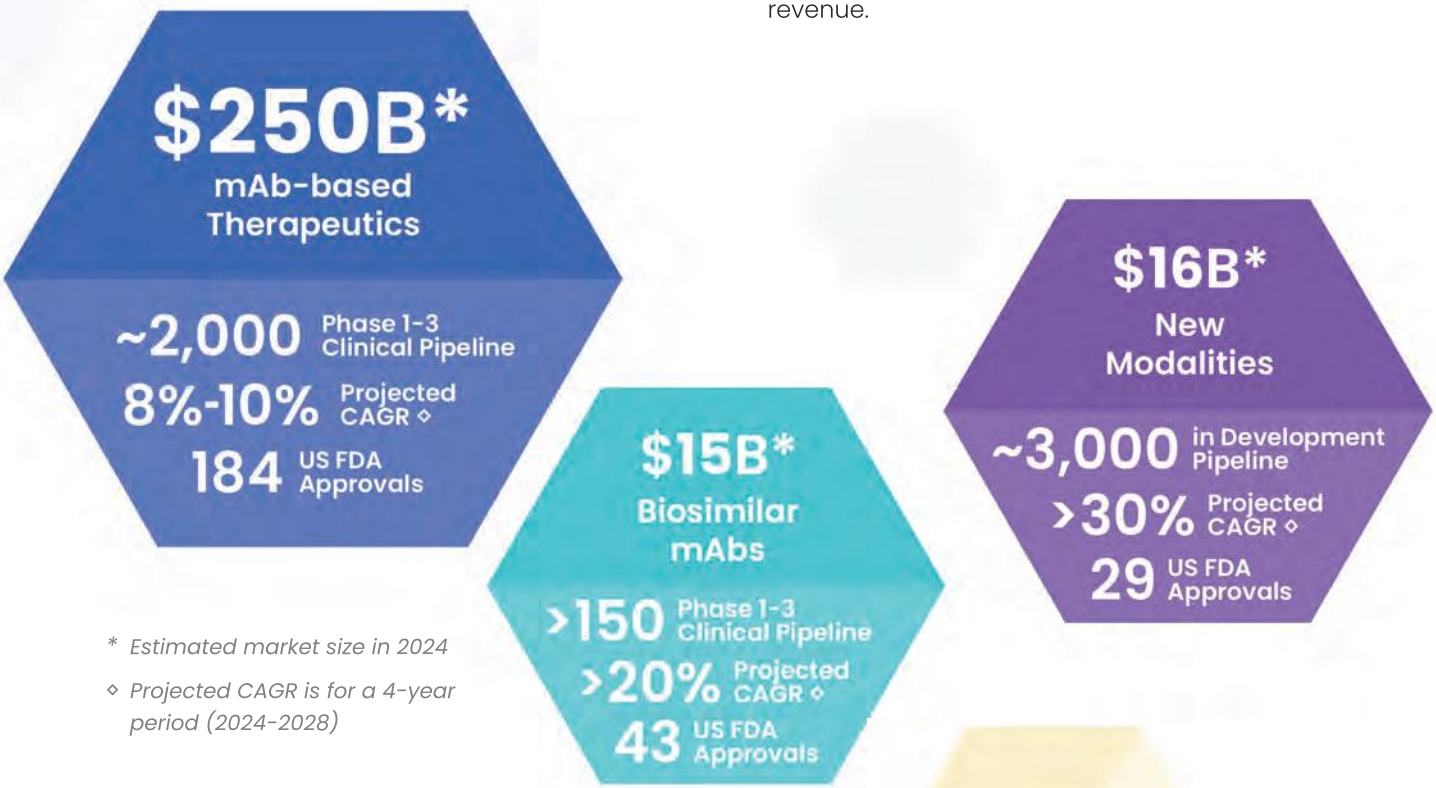
From a regional standpoint, North America orders increased 14%, EMEA was in line with 2023, and APAC demand excluding China grew 30%. We believe that the overall environment in China has stabilized as we saw single-digit order growth in the second half compared to the first half of 2024.

With plenty of positive order trends as we closed out the year, we were also pleased to see end market wins, with an uptick in U.S. biopharmaceutical drug approvals.

Healthy Biopharma End Market

In 2024, we saw a record number of US FDA approvals for monoclonal antibody-based therapeutics ("mAbs"), totaling 25 across 13 originator drugs and 12 biosimilars. In addition, there were seven new modality approvals, inclusive of the first approved mRNA vaccine outside of COVID. At the end of 2024, there were a total of 184 US FDA approved mAb-based therapeutics, and 29 new modality approvals.

Even more encouraging, there were over 2,000 mAbs in phase 1 -3 clinical pipelines, and 3,000-plus new modalities in development at year end 2024, according to our market research. This robust clinical pipeline is favorable to Repligen, as clinical stage (versus commercial) demand accounts for approximately 65% of our total revenue.



* *Estimated market size in 2024*

◇ *Projected CAGR is for a 4-year period (2024-2028)*

In the larger mAbs market, we are seeing the benefits from loss of exclusivity for commercially approved "originator" drugs, as patents expire and face biosimilar competition, providing opportunities for relatively new to market Repligen products to be implemented in biosimilar manufacturing workflows.

Additional trends that we believe will benefit Repligen going forward include an aging population, more personalized drug development and a focus on production efficiencies to decrease our customers' manufacturing costs. We see the great majority of R&D pipelines include new modality development programs and we are purposefully well positioned to serve this market.

Thanks to our Key Account Management initiative we are very well positioned to benefit from these improving market conditions.

Generated Strong Cash Flow

We exited 2024 with $757 million of cash and cash equivalents after deploying $55 million for the acquisition of Tantti. During 2024, we generated $178 million of cash flow from operations, an increase of 56% compared to 2023 on improved working capital management. With a reduction of more than 15% in capital expenditures, we were able to generate $146 million of free cash flow compared to $75 million in 2023. A strong balance sheet enables Repligen to continue to pursue potential acquisitions with a focus on new modalities and process analytical technologies.

$757M
Cash & Cash Equivalents at YE 2024

+56%
Cash Flow From Operations

-15%
Capital Expenditures

M&A Spotlight

In December 2024, we completed the acquisition of chromatography innovator Tantti of Taiwan. Tantti supports our long-term Proteins growth strategy, as we've become less reliant on OEM demand and have leveraged our internal expertise in ligand development. The acquisition of Tantii is a strategic win for our Proteins franchise and supports our technology leadership position in new modalities. The acquisition also complements our Chromatography portfolio, where Repligen-owned resins can now be pre-packed into our OPUS® columns, capturing more of the downstream bioprocessing workflow. By combining Tantti base beads with our Avitide affinity ligands, we now have the building blocks to better serve new modalities markets with Repligen purification resins, while continuing to expand our partnership with Purolite for monoclonal antibody-based purification.

Product Spotlight

tantti

A REPLIGEN COMPANY

AVIPure® dsRNA Clear Resin

In December, 2024 we launched AVIPure® dsRNA Clear OPUS® columns, a groundbreaking solution designed to simplify and enhance the production of mRNA therapeutics and vaccines.

As the market for mRNA-based biologics has expanded, so has the critical need for more effective removal of double-stranded RNA (dsNRA). Doing so enables the highest levels of drug efficacy in patients, while reducing or preventing undesirable immune responses. The AVIPure dsRNA Clear OPUS columns directly address this need, with a convenient, closed system for mRNA manufacturers. Unlike other approaches, this novel resin enables customers to remove dsRNA from transcribed RNA, in a safe, scalable way without the need for high heat or solvents with toxic reagents. Designed for flexibility and performance, the resins come pre-packed in OPUS chromatography columns, ensuring seamless integration into biomanufacturing workflows.

The AVIPure dsRNA Clear resin combines Tantti's innovative DuloCore® bead technology with our AVIPure affinity ligands. Add on OPUS, and we believe this is just our first step toward building a portfolio of gold standard products for new modality purification. This launch reaffirms our commitment to enabling our customers to deliver safe, high quality biotherapeutics while reducing costs.

Umay Saplakoğlu, Vice President
Proteins and Incubator

Product Spotlight

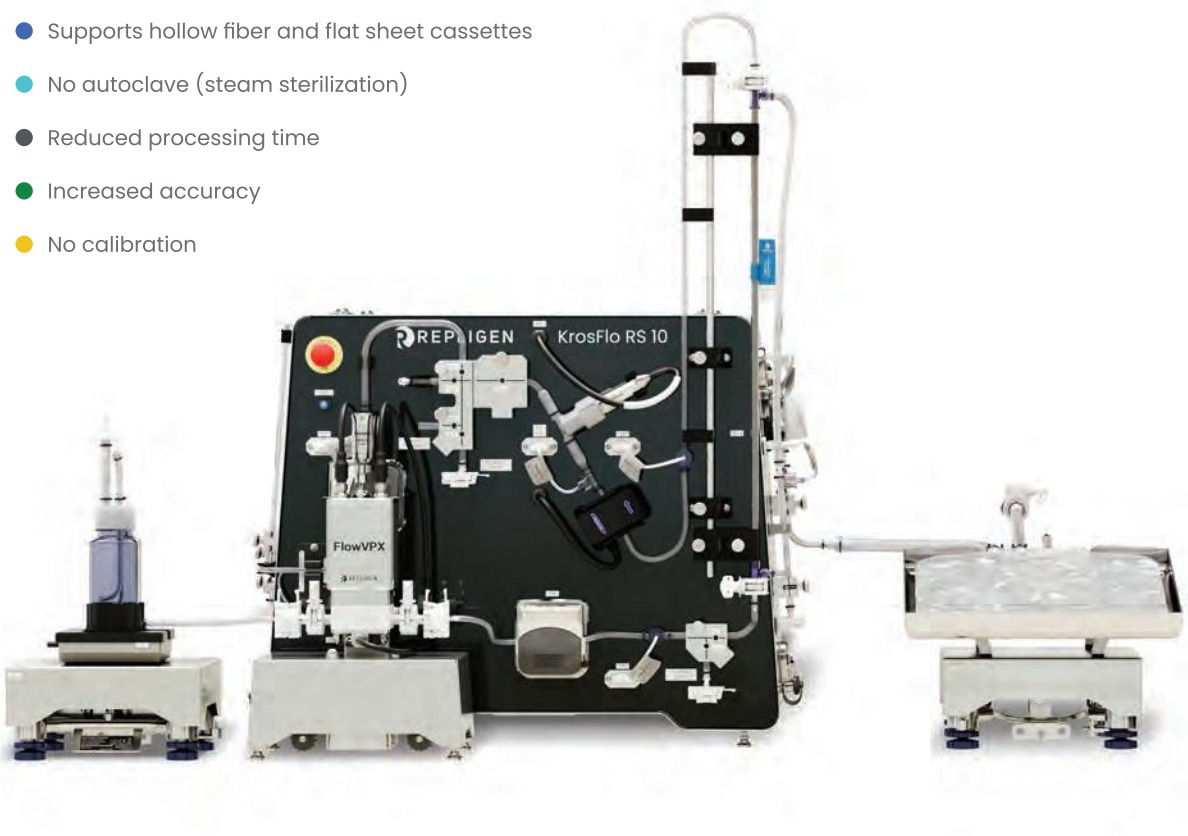
KrosFlo® RS 10 RPM TFF system

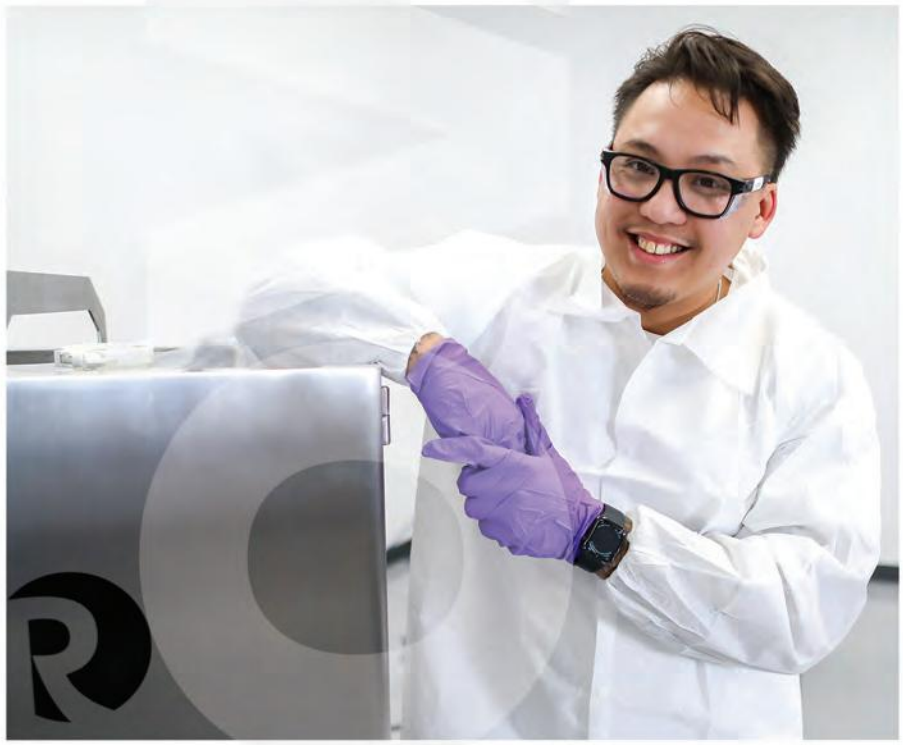
In April 2024 we unveiled our KrosFlo® RS 10 RPM Tangential Flow Filtration (TFF) system, the industry's first-to-market bench-scale TFF system with in-line analytics at its scale, built specifically for cGMP production with end-to-end automation. The technology is positioned for the manufacturing of new modalities, inclusive of gene therapy, cell therapy and mRNA-based biologics.

As the industry continues to shift towards personalized medicine, there is a growing need to manufacture therapeutics in small batches while controlling the relatively high costs. Addressing this unmet need is the KrosFlo RS 10 RPM system. Compared to conventional small-scale TFF systems, the automated nature of RS-10 translates into less human error, better record keeping and compliance, and overall improved process efficiency and consistency among batches. RS-10 utilizes Repligen's valve block technology, minimizing hold-up volumes for maximum recovery of high value modalities.

The products we have highlighted are good examples of Repligen's responsiveness to our customers' unmet needs, and our ability to step up to the challenge, through select development, acquisition and introduction of highly differentiated solutions. We believe this approach elevates the customer experience and builds value for our shareholders.

- Supports hollow fiber and flat sheet cassettes
- No autoclave (steam sterilization)
- Reduced processing time
- Increased accuracy
- No calibration





9 Notable 2024 Product Launches

Proteins

- 2 resin launches (Purolite)
- 2 resin launches (Avitide)

Chromatography

- Single-use valves for use on OPUS columns

Filtration

- KrosFlo RS 10 RPM TFF system
- ProConnex self-assembly kits
- 2D and 3D single-use bags with proprietary RG-V film

Process Analytics

- Expanded light source option for CTech FlowVPX

We Elevated the Customer Experience at the Repligen Training & Innovation Center

As a commitment to the customer experience, we hosted a grand opening of the Repligen Training & Innovation Center "RTIC" in September 2024. Located at our Waltham, MA headquarters, RTIC is a 7,500 square foot dedicated space that features product exhibits, demonstration space and technical training areas. We can now showcase all of Repligen's bioprocessing technologies under one roof, spanning both upstream and downstream products, providing customers with pre- and post-sales support to provide a hands-on experience with our innovative bioprocessing solutions.

An important factor in our decision to build the RTIC space was efficiency and sustainability; allowing our team, our customers and our investors to visit one location to see the wide range of bioprocessing products that we manufacture and assemble at 16 locations worldwide. We continue to integrate Sustainability initiatives as we set our business plans for the years ahead.

We Advanced Impacts in Sustainability

Formally embracing sustainability into our mindset and daily operations influences how we work and enables us to effect positive change. At Repligen, we are committed to building a culture where all people can grow and thrive, promoting inclusivity at all levels. We are pleased to have published in 2024 our "*Advancing Impacts*" report for the year 2023, demonstrating how we are moving our sustainability strategy forward.

Repligen innovation unlocks opportunity by enabling our customers to speed up their development and manufacture of biological drugs. By enabling them to generate more product in less space and with less waste, we contribute to global sustainability goals.

In 2024, we advanced multiple waste reduction initiatives, and as part of our quarterly business reviews with specific key suppliers, we now include discussions on human rights, anti-bribery and anti-corruption; upholding of our high principles is being incorporated into our Master Service Agreements (MSAs) and supplier management framework.

On the next page are some of our 2023 Sustainability Report highlights, and we look forward to publishing our 2024 Sustainability Report later in 2025.

I'm especially proud to have led the development of this reformatted corporate sustainability report and to be leading the build-out of our SBTi submission plan to lower total GHG emissions in alignment with the latest climate science. This publication also serves as Repligen Corporation's 2023 Communication on Progress in fulfillment of our annual commitment to the UNGC (United Nations Global Compact).

Dianne Heiler, Vice President of Sustainability and Global Head of Packaging Engineering

Advancing Impacts: Report Highlights

88%

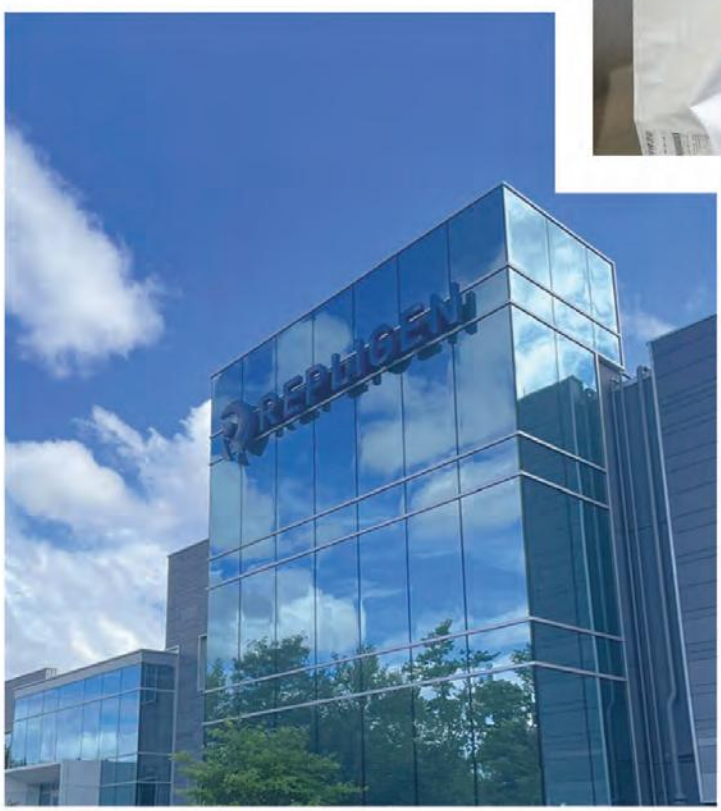
13 of our 18 manufacturing sites were powered by 100% renewable electricity, up from 9 sites in 2022, and representing 88% of our global consumption

29%

Percent of women in management, defined as Associate Director and above, compared to 27% in 2022

–25%

Reduction in overall GHG emissions (tons CO_2e) compared to 2022 across Scopes 1, 2 and 3



+60%

Increase in productivity savings through the Repligen Performance System (RPS) compared to 2022

2050

Committed to net-zero emissions by 2050 with Science Based Targets initiative (SBTi)

Our Positive 2025 Outlook and Strategic Priorities

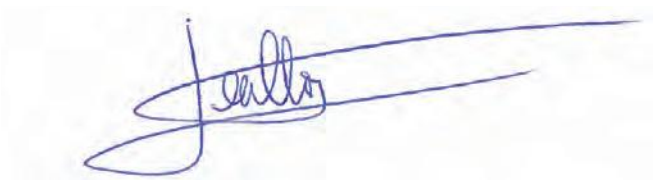
There are many reasons to be excited as we move into 2025, with the overall bioprocessing market showing many signs of improvement. As we exit 2024 with strong order momentum, a growing opportunity funnel and a laser-focus on commercial execution, we remain confident in our ability to achieve our 2025 goals.

In order to deliver on our financial targets, our strategic priorities will center on the following:

1. Accelerating our revenue growth and maintaining growth above market
2. Capitalizing on our best-in-class innovation with increased investment in R&D
3. Expanding our margins by 100–200 basis points
4. Maintaining our ambition of acquiring companies and/or technology assets to further strengthen and expand our business
5. Becoming further fit for growth as we position ourselves to become a significantly larger business

Combining Talent, Discipline & Innovation: Fit For Growth

We enter 2025 with a remarkably talented team of employees and a deeply experienced leadership team. I believe we have the right combination of talent, vision and discipline that will enable us to execute on our 2025 goals and priorities. As our markets continue to improve and as we become further fit for growth, we remain steadfast in our commitment to deliver true innovation to our customers, and drive long-term reward for our shareholders.



Olivier Loeillot
President and CEO

10-K

2024

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

FORM 10-K

☒ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**
For the fiscal year ended December 31, 2024
OR
☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from to
Commission File Number 000-14656

REPLIGEN CORPORATION

(Exact name of registrant as specified in its charter)

Delaware	**04-2729386**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**
41 Seyon Street, Bldg. 1, Suite 100 Waltham, MA	**02453**
(Address of principal executive offices)	**(Zip Code)**

Registrant's telephone number, including area code: (781) 250-0111

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

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock, par value $0.01 per share	RGEN	The Nasdaq Global Select Market

Securities registered pursuant to Section 12(g) of the Act: None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☒ No ☐

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes ☐ No ☒

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

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

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

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

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. Yes ☐ No ☐

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

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

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

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

The aggregate market value of the voting and non-voting common equity held by non-affiliates as of June 30, 2024, the last business day of the registrant's most recently completed second fiscal quarter, was $5,979,282,111.

The number of shares of the registrant's common stock outstanding as of March 11, 2025, was 56,148,556.

Documents Incorporated By Reference

The registrant intends to file a proxy statement pursuant to Regulation 14A within 120 days of the end of the fiscal year ended December 31, 2024. Portions of such proxy statement are incorporated by reference into Part III of this Annual Report on Form 10-K.

Auditor Firm Id	Auditor Name	Auditor Location
42	Ernst & Young LLP	Boston, Massachusetts, United States

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Summary of the Material Risks Associated with Our Business

Our business is subject to numerous risks and uncertainties that you should be aware of in evaluating our business. These risks include, but are not limited to, the following:

- Our product revenue may be negatively impacted by a number of factors, including without limitation, competition in the bioprocessing market, our historical reliance on a limited number of large customers, our ability to develop or acquire additional bioprocessing products in the future, our ability to manufacture our bioprocessing products sufficiently and timely, supply chain issues and/or disruption, and our ability to effectively penetrate the bioprocessing products market.
- We rely on a limited number of suppliers or, for certain of our products, one supplier, and we may not be able to find replacements or immediately transition to alternative suppliers, which could have a material adverse effect on our financial condition, results of operations and reputation.
- The market may not be receptive to our new bioprocessing products upon their introduction.
- If our products do not perform as expected or the reliability of the technology on which our products are based is questioned, we could experience lost revenue, delayed or reduced market acceptance, increased cost and damage to our reputation.
- If we are unable to manufacture our products in sufficient quantities and in a timely manner, our operating results will be harmed, our ability to generate revenue could be diminished and our gross margin may be negatively impacted.
- Our acquisitions expose us to risks that could adversely affect our business, and we may not achieve the anticipated benefits of acquisitions of businesses or technologies.
- Our results of operations could be negatively affected by potential fluctuations in foreign currency exchange rates.
- Changes in tariffs, import/export restrictions, or trade policies could significantly impact our costs and ability to deliver products to customers in a timely manner.
- Our corporate restructuring and the associated headcount reduction may not result in anticipated savings, could result in total costs and expenses that are greater than expected which could disrupt our business.
- If we are unable to continue to hire and retain skilled personnel, then we will have trouble developing and marketing our products.
- If we are unable to obtain, maintain and protect our intellectual property rights related to our products, we may not be able to succeed commercially.
- Climate change, climate change-related regulation and sustainability concerns could adversely affect our businesses and the operations of our subsidiaries, and any actions we take or fail to take in response to such matters could damage our reputation.
- Natural disasters, geopolitical unrest, war, terrorism, public health issues, the ongoing conflicts between Russia and Ukraine and Israel and Palestine, or other catastrophic events could disrupt the supply, delivery or demand of products, which could negatively affect our operations and performance.
- Our internal computer systems, or those of our customers, collaborators or other contractors, may be subject to cyber-attacks or security breaches, which could result in a material disruption of our product development programs.

FORWARD-LOOKING STATEMENTS

This Annual Report on Form 10-K ("Form 10-K") contains forward-looking statements which are made pursuant to the safe harbor provisions of Section 27A of the Securities Act of 1933, as amended, (the "Securities Act") and Section 21E of the Securities Exchange Act of 1934, as amended. These statements may be identified by such forward-looking terminology as "may," "should," "expects," "intends," "plans," "anticipates," "believes," "estimates," "predicts," "potential," "continue" or the negative of these terms or other comparable terminology. The forward-looking statements in this Form 10-K do not constitute guarantees of future performance. Investors are cautioned that express or implied statements in this Form 10-K that are not strictly historical statements, including, without limitation, statements regarding current or future financial performance, potential impairment of future earnings, management's strategy, plans and objectives for future operations or acquisitions, product development and sales, research and development, selling, general and administrative expenditures, intellectual property and adequacy of capital resources and financing plans constitute forward-looking statements. Such forward-looking statements are subject to a number of risks and uncertainties that could cause actual results to differ materially from those anticipated, including, without limitation, the risks identified under the caption "Risk Factors" and other risks detailed in this Form 10-K and our other filings with the Securities and Exchange Commission. We assume no obligation to update any forward-looking information contained in this Form 10-K, except as required by law.

PART I

ITEM 1. BUSINESS

The following discussion of our business contains forward-looking statements that involve risks and uncertainties. When used in this report, the words "intend," "anticipate," "believe," "estimate," "plan" and "expect" and similar expressions as they relate to us are included to identify forward-looking statements. Our actual results could differ materially from those anticipated in these forward-looking statements and are a result of certain factors, including those set forth under "Risk Factors" and elsewhere in this Annual Report on Form 10-K ("Form 10-K").

References throughout this Form 10-K to "Repligen Corporation", "Repligen", "we", "us", "our", or the "Company" refer to Repligen Corporation and its subsidiaries, taken as a whole, unless the context otherwise indicates.

Overview

Repligen Corporation is a global life sciences company that develops and commercializes highly innovative bioprocessing technologies and systems that increase efficiencies and flexibility in the process of manufacturing biological drugs.

As the overall market for biologics continues to grow and expand, our primary customers – global biopharmaceutical companies, contract development and manufacturing organizations and other life science companies (integrators) – face critical production cost, capacity, quality and time pressures. Built to address these concerns, our products help set new standards for the way biologics are manufactured. We are committed to inspiring advances in bioprocessing as a trusted partner in the production of critical biologic drugs – including monoclonal antibodies ("mAbs") and mAb derivatives, recombinant proteins, RNA-based therapeutics and vaccines, and cell and gene therapies ("C&GT") – that are improving human health worldwide. Increasingly, our technologies are being implemented to overcome challenges in processing plasmid DNA (a starting material for the production of mRNA) and gene delivery vectors such as lentivirus and adeno-associated viral vectors.

We currently operate as one bioprocessing business, with a comprehensive suite of products to serve both upstream and downstream processes in biological drug manufacturing. Building on over 40 years of industry expertise, we have developed a broad and diversified product portfolio that reflects our passion for innovation and the customer-first culture that drives our entire organization. We continue to capitalize on opportunities to maximize the value of our product platform through both organic growth initiatives (internal innovation and commercial leverage) and targeted acquisitions.

Our corporate headquarters are located in Waltham, Massachusetts, with additional administrative and manufacturing operations worldwide. A majority of our 16 manufacturing sites are located in the United States (California, Massachusetts, New Hampshire, New Jersey, and New York). Outside the United States, we have manufacturing sites in Estonia, France, Germany, Ireland, the Netherlands, Sweden, and Taiwan.

Our Products

Our bioprocessing business is comprised of four main franchises: Filtration (including Fluid Management); Chromatography; Process Analytics; and Proteins.

Since 2012, we have purposely built a highly diversified portfolio of products offered under these franchises, developing high-value technologies that enable more efficient drug manufacturing processes for our customers, through internal research and development ("R&D") programs and strategic acquisitions. We are committed to sustainable innovation and have earned a reputation as an innovation leader in bioprocessing. We have consistently introduced disruptive new products that solve for specific bioprocessing challenges faced by customers. Our growth strategy continues to expand our geographic scope and customer base and broaden the applications of our technologies.

To support our sales goals for these products, we make ongoing investments in our commercial organization, our R&D programs, our business systems and our manufacturing capacity. We regularly evaluate and invest in these areas as needed to ensure timely deliveries and to stay ahead of customer demand for our products.

The majority of our revenue is derived from consumable and/or single-campaign ("single-use") product sales, as compared to associated hardware and equipment. The customization, scalability and plug-and-play convenience of these products, and in many cases the closed nature of our technologies, make them ideal for use in biologics manufacturing processes where contamination risk is a critical concern of our customers.

Shifting to Integrated Solutions

Since 2012, and through year end 2024, we have completed 14 acquisitions across our four franchises, building a base of technology assets that we can improve upon and/or develop next-generation versions of through our internal R&D team. Our acquisition strategy is purposeful, considering the potential for integration with our internally-developed technologies, and across products and franchises.

In 2024, the results of our mergers and acquisitions and R&D efforts are reflected in our ability to offer more integrated solutions across the bioproduction workflow. Our commercial approach is shifting from "individual product" to "whole system" sales that can support entire unit operations, the management of fluids between unit operations, and in-line advanced analytics. For example, providing filtration systems for production and harvest steps (upstream), and connecting those to chromatography and filtration systems for purification and formulation steps (downstream).

Key Products Within Each of Our Franchises

FILTRATION

Filtration is our largest franchise with the broadest product offering covering upstream and downstream technologies. Below is a description of some of our key products:

XCell ATF® Cell Retention Systems

Our filtration products offer a number of advantages to manufacturers of biologic drugs and are used in process development and process scale (clinical and commercial) production. Our XCell ATF systems are used in upstream perfusion (continuous) and N-1 (intensified fed-batch or hybrid perfusion) cell culture processing.

XCell ATF is a cell retention technology. The system is comprised of an advanced hollow fiber ("HF") filtration device, a low shear pump and a controller. The XCell ATF system is connected to a bioreactor and enables the cell culture to be run continuously, with cells being retained in the bioreactor, fresh nutrients (cell culture media) being fed into the reactor continuously, and clarified biological product and cell waste being removed (harvested) continuously. The cells are maintained in a consistent nutrient-rich environment and can reach cell densities two- and three-times higher than those achieved by standard fed-batch culture. As a result, product yield is increased, which improves facility utilization and can reduce the size of a bioreactor required to manufacture a given volume of biologic drug product. XCell ATF systems are available in a wide range of sizes that can easily scale from laboratory use through full production with bioreactors as large as 5,000 liters.

In 2023, we introduced next-generation XCell® Large-Scale controllers, enabling increased process intensification through dual-operation of two ATF devices from a single controller, and through advanced monitoring and control of flow rates with smart sensor technology. Our ATF large-scale controllers are designed for scalability from bench top to commercial manufacturing, and for versatility of applications, including perfusion and modified fed-batch (N-1) manufacturing.

Tangential Flow Filtration Consumables

Our TangenX® product portfolio includes flat sheet ("FS") tangential flow filtration ("TFF") cassettes that are used primarily in downstream, ultrafiltration processes, e.g., biologic drug concentration, buffer exchange and formulation processes, our single-use SIUS® line, including our reusable PRO line of cassettes, providing customers with a high-performance, cost saving alternative to other companies' TFF cassette offerings and our TangenX SC Device, the industry's first holder-free, self-contained ("SC") TFF device, which was launched in November 2023.

TFF is a rapid and efficient method for the concentration and formulation of biomolecules that is widely used in many applications in biopharmaceutical development and manufacturing. Our TangenX FS TFF cassettes feature high performing-membrane chemistries that offer superior selectivity for a wide range of applications. A controlled manufacturing process that balances flux and selectivity delivers maximum

flux for increased productivity and tight control of the membrane pore size for enhanced selectivity and recovery. Each single-use cassette is delivered pre-sanitized and ready to be equilibrated and used for tangential flow, ultrafiltration and diafiltration applications.

Use of SIUS TFF cassettes eliminates non-value-added steps (cleaning, testing between uses, storage and flushing) that are required with reusable TFF products, providing cost and time savings. For process economics requiring reusable cassettes, TangenX PRO cassettes are available with the same high performance membranes used in SIUS cassettes. Our TangenX cassettes are interchangeable with filter hardware from multiple manufacturers, simplifying customer trial and adoption. In 2020, we introduced SIUS Gamma single-use device, which we engineered to harness the performance and efficiencies of TangenX SIUS membranes and cassettes, while also providing the convenience of a fully assembled, aseptically closed and gamma-irradiated, sterile device. The device is delivered as a single unit composed of the cassette, fluid manifold, clamps, tubing and aseptic connectors. The SIUS Gamma device is ideal for adenovirus C&GT and other processes where large volumes need to be concentrated in a sterile, closed environment.

Our TangenX® SC Device simplifies and streamlines downstream flat sheet UF/DF processes by reducing set up time by 80%, eliminating holders and torquing requirements which reduces the risk of product loss caused by changes in compression or cassette misalignment during installation, allowing users to seamlessly transition from traditional cassettes and reducing bioburden risk and enhancing safety because it is aseptically closed and gamma irradiated and isolates operators from potentially hazardous materials.

Tangential Flow Filtration Systems: *KrosFlo® TFF*

Our KrosFlo systems for TFF combine significant configurability with premium quality manufacturing. Our TFF systems are designed for scalability from small to large (up to 5,000 liters) volumes, flexibility between HF and FS filter formats, and the ability to use the same system in different unit operations while deploying ready-to-use application-specific flow paths.

Our KrosFlo TFF systems are turnkey solutions for TFF, offered with either TangenX FS cassettes or with our HF filters.

KrosFlo® Flat Sheet TFF Systems

Our 2020 acquisition of ARTeSYN Biosolutions Holdings Ireland Limited ("ARTeSYN") enabled us to develop and market KrosFlo RS TFF systems that integrate our consumable and equipment offering, providing greater convenience and efficiency for our customers.

We launched our KrosFlo RS 20 series systems in 2022, focusing their use in mRNA and C&GT therapy applications, where they are used primarily in downstream formulation. These responsive TFF systems completely automate sanitization, concentration and product recovery processes. The combination of injection molded tubing, over-molded connectors and valve blocks significantly lowers product hold-up volume to maximize product recovery. With the same software, hardware, controls and cGMP compliance built into every system, and with pre-assembled flow kits for error-free installation, the KrosFlo RS platform offers operational simplicity that can easily be scalable from lab- through production-scale use. KrosFlo FS systems integrate over 10 components with specifications to process volumes between 140 milliliters and 500 liters.

KrosFlo® Hollow Fiber TFF Systems

Our filtration business is strengthened by a leading portfolio of Spectrum® HF filtration solutions, including fully integrated KrosFlo TFF systems with Konduit automated process monitoring and ProConnex® Flow Path single-use assemblies. The KrosFlo family of HF TFF systems integrate multiple components with specifications to process volume between 2 milliliters and 5,000 liters – from lab-scale through commercial manufacturing.

In early 2023 we introduced our RS 30 series of KrosFlo TFF systems, featuring increased automation capabilities. The RS 30 series systems integrate a single-use tulip tank re-circulation vessel, which allows for dynamic control and response to changing fluid levels for maximum product recovery in fed-batch, batch concentration and diafiltration processes. The cGMP compliant, fully automated 1/2 inch single-use TFF system delivers outstanding performance in a small footprint. In alignment with our integrated systems strategy, the system includes ProConnex flow paths to integrate advanced fluid management technologies including overmolded connections, pump heads, tubing filters and sensors in a single-use device. Flow paths easily attach to the system to simplify operation and increase process efficiency.

KrosFlo®RPM™ Systems with integrated CTech™ FlowVPX® Technology

In 2022, we completed the development of a hollow fiber system that combines KrosFlo TFF with CTech FlowVPX Real-Time Process Management ("RPM"®) technology, enabling "walk-away automation" of downstream UF/DF processes. Toward the end of 2022, we launched KrosFlo KR2i RPM for low-volume, high concentration applications. This was the first-to-market TFF system to incorporate real-time process monitoring for in-line protein concentration management. By coupling KrosFlo TFF and FlowVPX functionality, customers can benefit from improved process control and efficiency, while reducing process risk by ensuring accurate concentration throughout the TFF process.

KrosFlo RPM systems monitor concentration during UF/DF runs without having to depend on mass inputs and off-line fixed pathlength UV-Vis spectrophotometers. Risk is further mitigated with fully enclosed ProConnex custom flow paths as a part of the automated TFF process.

Since the debut of the KrosFlo KR2i RPM (2 mL-15L) system, we expanded the KrosFlo RPM offering, introducing KrosFlo FS-15 RPM (150mL-15L) toward the end of 2023. In 2024 we introduced KrosFlo RS-10 – the first bench sacle TFF system built specifically for cGMP production, with end-to-end automation.

The KrosFlo RPM Sytems portfolio continues to expand to cover a wide range of volumes from lab-to production-scale requirements. We believe KrosFlo RPM solutions provide key process insights to users to reduce cycling time and minimize batch risks, both highly value attributes for bioprocessing users.

Tangential Flow Depth Filtration Systems: KrosFlo® TFDF®

Our KrosFlo® TFDF® systems are a unique technology that combines the benefits of both tangential flow and depth filtration, simplifying and intensifying upstream perfusion for viral vector production for Cell and Gene Therapy. Combining advanced control hardware, novel high-throughput tubular depth filters, and ProConnex® TFDF® flow paths, the system offers high flux, superior capacity, and low turbidity. Integrated sensors streamline validation, while low hold-up volume, high recovery, and a small footprint reduce processing time and simplify setup. TFDF technology provides a scalable, efficient technology to increase viral vector production.

Strengthening our Filtration Franchise through Acquisitions

With our acquisition of Polymem S.A. ("Polymem") on July 1, 2021, we further expanded our HF membrane and module production capabilities and added core R&D, engineering and production expertise in HF technology for both industrial and bioprocessing markets. The Polymem business complements our Spectrum HF product line, which includes KrosFlo HF TFF systems and ProConnex fluid management. The acquisition of Polymem accelerated our HF manufacturing buildout and added a Europe-based HF manufacturing center of excellence.

With our acquisition of BioFlex Solutions LLC ("BioFlex") and Newton T&M Corp. ("NTM") on December 16, 2021, we complemented and expanded our filtration franchise, as both BioFlex and NTM focus on single-use fluid management components, including single-use clamps, adapters, end caps and hose assemblies. These products are essential components in our upstream and downstream product offerings – especially our systems with line-sets and flow paths. These acquisitions streamline and increase our control over many components in our single-use supply chain, which ultimately should drive reduced lead-times for our customers in the coming years.

We acquired FlexBiosys, Inc. ("FlexBiosys") on April 17, 2023, further complementing and expanding our fluid management portfolio of offerings with its expert design and custom manufacturing of single-use bioprocessing products and a comprehensive range of products that include bioprocessing bags, bottles, and tubing assemblies.

With our acquisition of Metenova Holding AB ("Metenova") on October 2, 2023, we strengthened our fluid management portfolio with the addition of magnetic mixing and drive train technologies that are widely used by global biopharmaceutical companies and contract development and manufacturing organizations.

The growth of our filtration business has allowed us to substantially increase our direct sales presence in Europe and Asia and diversify our end markets to include all biologic classes, including mAbs, vaccines, recombinant proteins and C&GT.

CHROMATOGRAPHY

Our chromatography franchise includes a number of products used in downstream purification, development, manufacturing and quality control of biological drugs. The main driver of growth in this portfolio is our OPUS® pre-packed column ("PPC") product line.

In addition to OPUS, with our acquisition of ARTeSYN in 2020, we added chromatography systems to our offerings, providing greater flexibility and market opportunity as we scale and expand our systems portfolio.

Additional chromatography products include our ELISA test kits, used by quality control departments to detect and measure the presence of leached Protein A and/or growth factor in the final product. Our chromatography ligand and resin products are part of our Proteins portfolio.

OPUS Pre-Packed Columns

Our chromatography franchise features a wide range of OPUS columns, which we deliver to our customers sealed and pre-packed with their choice of resin. These are single-use or campaign-use disposable columns that replace the use of customer-packed glass columns for downstream purification. By designing OPUS columns to be a technologically advanced and flexible option for the purification of biologics from process development through clinical and commercial-scale manufacturing, Repligen has become a leader in the PPC market. Our biomanufacturing customers value the significant cost savings that OPUS columns can deliver by reducing set up time, labor, equipment and facility costs – in addition to delivering product consistency and "plug-and-play" convenience.

We launched our first production scale OPUS columns in 2012 and have since added larger diameter options that scale up to use with 2,000 liter bioreactors. Our OPUS 80R column is the largest available PPC on the market for use in late-stage clinical or commercial purification processes. We offer unique features such as a resin recovery port on our larger columns, which allows our customers to remove and reuse the recovered resin in other applications. We believe the OPUS 5-80R product line is the most flexible product line available in the market, serving the purification needs of customers manufacturing mAbs and other biologics such as vaccines and C&GT.

In addition to our larger scale OPUS columns, our portfolio includes our smaller-scale OPUS columns, including our RoboColumn®, MiniChrom® and ValiChrom® columns used for process development ("PD") and validation. These columns are used in high-throughput PD screening, viral clearance validation studies and scale down validation of chromatography processes.

We maintain customer-facing and manufacturing centers in both the United States and Europe for our OPUS column customers, and offer a premier ability to pack any of hundreds of chromatography capture resins available, as per our customers' choice.

KRM™ Chromatography Systems

Through our acquisition of ARTeSYN in 2020, we gained state-of-the-art, configurable chromatography systems that can integrate a wide range of hardware, components and consumable products to simplify bioprocessing operations for our customers. Our KRM chromatography systems are precision engineered for high product recovery (low hold-up volumes), high bioactivity (less stress on the product of interest) and reduced risk of deviation (simple changeovers and pre-assembled flow kits). The KRM systems contain closed single-use flow paths (less risk of contamination and product loss) and other advanced fluid management technologies (over-molded connectors, pump heads, filters and pressure sensors), intuitive software and our process analytics technology enabled.

PROCESS ANALYTICS

Our process analytics products complement and support our filtration, chromatography and proteins franchises as they allow end-users to make at-line or in-line absorbance measurements allowing for the determination of protein concentration in filtration, chromatography formulation and fill-finish applications.

SoloVPE® Device

Our SoloVPE slope spectroscopy system is the industry standard for offline and at-line absorbance measurements for protein concentration determination in process development, manufacturing and quality control settings.

FlowVPE® Device

Our FlowVPE slope spectroscopy system enhances the power of slope spectroscopy and provides in-line protein concentration measurement for filtration, chromatography and fill-finish applications. A key benefit of this in-line solution is the ability to monitor a manufacturing process in real time.

FlowVPX® System

FlowVPX slope spectroscopy system is our next-generation FlowVPE launched at the beginning of 2021 and designed to meet the rigors of regulatory GMP requirements. FlowVPX offers reliable real-time results with integrated ease for concentration measurements during every stage of the downstream GMP-compliant production-scale biologics manufacturing.

Use of slope spectroscopy systems delivers multiple process benefits for our biopharmaceutical manufacturing customers, compared to traditional UV-Vis approaches. Key benefits include: the elimination of manual dilutions and sample transfers from process development/manufacturing to labs, rapid time to results (minutes versus hours), improved precision, built-in data quality for improved reporting and validation, and ease of use.

KrosFlo® RPM™ Systems with integrated FlowVPX® Technology

In 2022, we completed the development of a hollow fiber system that combines KrosFlo TFF with CTech FlowVPX Real-Time Process Management ("RPM"") technology, enabling "walk-away automation" of downstream UF/DF processes. See more about KrosFlo RPM systems under "FILTRATION", page 5.

Culpeo® QCL-IR Liquid Analyzer

Pursuant to a 15-year license agreement that we entered into with DRS Daylight Solutions, Inc. ("Daylight") in September 2022, we obtained the exclusive right to use Daylight's quantum cascade laser technology ("QCL"), including its Culpeo® QCL-IR Liquid Analyzer ("Culpeo") specifically in the field of bioprocessing. In November 2024, the Company amended the Daylight license agreement to extend the License Agreement one additional year. Culpeo is a compact, intelligent spectrometer that uses the power of QCL to analyze and identify chemicals. Our in-licensing of these rights complements our existing process analytics franchise. Adding mid-IR (higher sensitivity QCL-IR) to UV spectroscopy, we believe this will serve to accelerate and expand adoption of off-line and in-line process monitoring in the bioprocessing industry. Additionally, we are focused on expanding the QCL portfolio, with plans to integrate these solutions into our chromatography and filtration systems.

PROTEINS

Our proteins franchise is represented by our affinity ligands and resins used to purify a wide range of biological drugs including monoclonal antibodies and new modalities. Our proteins franchise also includes cell culture growth factor products, which are a key component of cell culture media used in upstream bioprocessing to increase cell density and improve product yield.

Protein A Affinity Ligands

Protein A ligands are the essential "binding" component of Protein A affinity chromatography resins used in the purification of virtually all mAb-based drugs on the market or in development. Historically, we manufactured multiple forms of Protein A ligands under long-term supply agreements with major life sciences companies including Cytiva (a standalone operating company owned by Danaher Corporation), MilliporeSigma and Ecolab Life Sciences ("Ecolab") for their Purolite ("Purolite") resin business. These life sciences companies in turn sell their chromatography resins to end users (pharmaceutical developers and manufacturers). Cytiva has fully transitioned to in-house manufacturing for their ligand needs, however we continue to manufacture our ligands for integrators including Purolite.

Our Affinity Ligand Collaborations

In June 2018, we entered into an agreement with Navigo Proteins GmbH ("Navigo") for the exclusive co-development of multiple affinity ligands for which Repligen holds commercialization rights. We manufacture and exclusively supply the first of these ligands, NGL-Impact® A, to Purolite, for use with their Purolite™ Praesto™ Jetted A50 Protein A resin product.

In September 2021, the Company and Navigo successfully completed co-development of a novel affinity ligand that addresses aggregation issues associated with pH sensitive antibodies and Fc-fusion proteins. We are manufacturing and supplying this ligand, NGL-Impact® HipH, to Purolite. We have a long-term supply agreement with Purolite for NGL-Impact and potential additional affinity ligands that may advance from our Navigo collaboration.

Our Purolite Agreement

In October 2022, we extended our long-term supply agreement with Purolite Purolite through 2032 and broadened its scope to include affinity ligands targeting antibody fragments in addition to those targeting mAbs and Fc-fusion proteins. This extension and product line expansion aligns with our Proteins strategy and supports the acceleration in market adoption of the Praesto® affinity resin portfolio. It provides Purolite with exclusive access to mAb fragment ligands developed at Avitide, Inc. ("Avitide"), in addition to the NGL portfolio developed at Navigo. Repligen will continue to receive access to Purolite's leading-edge base bead technology, as we proceed with the development and commercialization of novel affinity resins focused on new modalities and C&GT.

In 2024, the Company and Ecolab announced the commercial launch of Praesto® CH1, a cross-linked agarose-based affinity resin designed to purify specialized mAbs such as bispecific antibodies and recombinant antibody fragments. This resin utilizes mAb fragment ligands developed at Avitide, and provides an alternative for the purification of antibody variants when Protein A resins are not suitable.

Adeno-Associated Virus Affinity Ligands and Resins from Avitide

In September 2021, we completed our strategic acquisition of Avitide, a market leader in affinity ligand discovery and development. This acquisition was a major step forward in building our proteins franchise, moving Repligen into affinity resin solutions for C&GT and other emerging modalities.

In February 2022, we launched three advanced affinity chromatography resins for use in gene therapy manufacturing workflows. The resins AVIPure®-AAV9; AVIPure®-AAV8; and AVIPure®-AAV2, were developed by Avitide and are specific to the major adeno-associated virus ("AAV") C&GT vectors used today. AAV vectors are the leading platform for gene delivery for the treatment of a variety of human diseases. In 2023, a new affinity resin for AAV5 was also launched, expanding the portfolio.

With our acquisition of Tantti Laboratory Inc. ("Tantti") on December 2, 2024, we expect to accelerate our expansion into new modality markets with unique, scalable purification solutions for these larger molecule biologics.

In December 2024, we launched AviPure® dsRNA Clear resin, pre-packed in OPUS columns. The AVIPure dsRNA Clear resin combines Avitide proprietary affinity ligands with Tantt's Dulocore® base bead technology to improve the purification of mRNA therapeutics and vaccines. This is double stranded RNA resin, the first affinity resin to remove the double stranded RNA impurity from transcribed RNA without heat or solvents.

Growth Factors

Most biopharmaceuticals are produced through an upstream mammalian cell culture process. In order to stimulate increased cell growth and maximize overall yield from a bioreactor, manufacturers often add growth factors, such as insulin, to their cell culture media. Our cell culture growth factor additives include LONG® R^3 IGF 1, our insulin-like growth factor that has been shown to be up to 100 times more biologically potent than insulin (the industry standard), thereby increasing recombinant protein production in cell culture fermentation applications.

Corporate Information

We are a Delaware corporation with our global headquarters in Waltham, Massachusetts. We were incorporated in 1981 and became a publicly traded company in 1986. Our common stock is listed on the Nasdaq Global Market under the symbol "RGEN". We have approximately 1,800 employees and operate globally with offices and manufacturing sites located at multiple locations in the United States, Europe and Asia. Our principal executive offices are located at 41 Seyon Street, Waltham, Massachusetts 02453, our website is www.repligen.com and our telephone number is (781) 250-0111.

2024 Acquisition

Tantti Laboratory Inc.

On December 2, 2024, the Company's subsidiary, Repligen Sweden AB acquired Tantti Laboratory Inc. ("Tantti") from the former shareholders of Tantti ("Tantti Seller") pursuant to a share swap agreement, dated as of July 27, 2024 (such acquisition, the "Tantti Acquisition"), by and among Repligen Sweden AB, the Tantti Seller, and the Company, in its capacity as guarantor of the obligations of Repligen Sweden AB under the Share Purchase Agreement.

Tantti, headquartered in Taoyuan City, Taiwan, has developed a unique portfolio of macroporous chromatography beads to optimize the purification of new modalities including viral vectors, viruses, nucleic acids and other large molecule biologics. The addition of Tantti further strengthens our portfolio in the new modality space.

Our Market Opportunity

Bioprocessing Addressable Market

The global addressable market for bioprocessing products is estimated to be approximately $20 billion of which we estimate Repligen's addressable market to be approximately $12 billion at year end 2024. This market includes bioprocessing products used to manufacture therapeutic antibodies, recombinant proteins and vaccines, as well as C&GTs.

Monoclonal Antibody Market

Antibody-based biologics alone accounted for approximately $250 billion of global biopharma revenue in 2024. Industry sources project the mAbs market to grow in the range of approximately 8% to 10% annually through 2027, driven by new approvals and expanded clinical uses for marketed antibodies, as well as the emergence of biosimilar versions of originator mAbs. As of December 31, 2024, over 180 mAbs were approved by the U.S. Food and Drug Administration ("FDA") to treat a wide range of diseases. Biological R&D remains robust, with more than 2,000 active mAb clinical trials ongoing to address a wide range of medical conditions.

In addition to investments in the discovery and development of novel biologic drugs, there has been substantial investment in follow-on products (biosimilars) by generic and specialty pharmaceutical as well as large biopharmaceutical companies. Development of follow-on products accelerated as the first major mAbs came off patent in the European Union and United States. Due to the high cost of biologic drugs, many countries in developing and emerging markets have been aggressively investing in biomanufacturing capabilities to supply lower cost biosimilars for the local markets. For both originator and follow-on biologics manufacturing, Repligen products are well-positioned to enable greater manufacturing flexibility, production yields and lower costs through improved process efficiencies.

New Modalities Markets

New modalities encompass cell and gene therapy, RNA based therapeutics and vaccines, and other non-mAb based biological drugs. New modalities have emerged in the past few years to become a rapidly growing area of biological drug development, with an estimated global market of greater than $15 billion in 2024, and over 3,000 active clinical trials underway at year-end 2024 according to industry sources. Statements by the FDA are supported by industry reports that estimate annual revenue growth of over 20% for new modalities markets over the next several years. The scientifically advanced therapeutic approaches have unique manufacturing challenges that many of our products can help address. We believe we are well positioned to participate in new modalities production, particularly in the manufacture of plasmids and viral vectors. Within new modalities, market, mRNA-based therapeutic programs have become an area of focus and investment by several large biopharmaceutical companies, following the regulatory approval of mRNA-based vaccines during the COVID-19 pandemic.

Our Strategy

We are focused on the development, production and commercialization of highly differentiated, technology-leading systems and solutions that address specific pressure points in the biologics manufacturing process and deliver substantial value to our customers. Our products are designed to optimize our customers' workflow to maximize productivity and we are committed to supporting our customers with strong customer service and applications expertise.

We intend to build on our history of developing market-leading solutions and delivering strong financial performance through the following strategies:

- *Continued innovation*. We plan to capitalize on our internal technological expertise to develop products that address unmet needs in upstream and downstream bioprocessing. We continue to invest in platform and derivative products to support our proteins, filtration, chromatography and process analytics franchises. We plan to strengthen our existing product lines with complementary products and technologies, including fluid management products, that are designed to allow us to provide customers with an integrated, more automated and more efficient manufacturing process on one or more measures including flexibility, convenience, time savings, cost reduction and product yield.
- *Platforming our products.* A key strategy for accelerating market adoption of our products is delivery of enabling technologies that become the standard, or "platform," technology in markets where we compete. We focus our efforts on winning early-stage technology evaluations through direct interaction with the key biomanufacturing decision makers in process development labs. This strategy is designed to establish early adoption of our enabling technologies at key accounts, with opportunity for customers to scale up as the biologic advances to later stages of development and potential commercialization. We believe this approach can accelerate the implementation of our products as platform products, thereby strengthening our competitive advantage and contributing to long-term growth.
- *Targeted acquisitions*. We intend to continue to selectively pursue acquisitions of innovative technologies and products. We intend to leverage our consolidated balance sheets to acquire technologies and products that improve our overall financial performance by improving our competitiveness in filtration (including fluid management), chromatography or process analytics, or by moving us into adjacent markets with common commercial call points.
- *Geographical expansion*. We intend to expand our global commercial presence by continuing to selectively build out our global sales, marketing, field applications and services infrastructure.
- *Operational efficiency*. We seek to expand operating margins through capacity utilization and process optimization strategies designed to increase our manufacturing yields. We plan to invest in systems to support our global operations, optimizing resources across our global footprint to maximize productivity.

Research and Development

Our R&D activities are focused on developing new high-value bioprocessing products across all of our franchises. We strive to continue to introduce truly differentiated products that address specific pain points in the biologics manufacturing process. Our commitment to innovation is core to the Repligen culture and our success as a company.

Sales and Marketing

Our sales and marketing strategy supports our objective of strengthening our position as a leading provider of products and services, addressing upstream, downstream and quality control needs of bioprocessing customers in the biopharmaceutical industry.

Our Commercial Team

To support our sales goals for our direct-to-consumer products, we have invested in our commercial organization. Since 2018, we have significantly expanded our global commercial organization from 103, to a commercial team of 334 employees as of December 31, 2024. This includes 273 people in field positions (sales, field applications and field service), 37 people in customer service and 24 in marketing. Geographically, 170 members of our commercial team are located in North America, 92 in Europe and 72 in Asia-Pacific ("APAC") regions.

Our bioprocess account managers are supported in each region by bioprocess sales specialists with expertise in filtration, chromatography or process analytics, and by technically trained field applications specialists and field service providers, who can work closely with customers on

product demonstrations, implementation and support. We believe that this model helps drive further adoption at our key accounts and also open up new sales opportunities within each region.

Ligand Supply Agreements

For our proteins franchise, we are committed to be a partner of choice for our customers with distributor and supply agreements in place with large life sciences companies such as Cytiva, MilliporeSigma and Purolite. The Cytiva Protein A supply agreement relating to our Waltham, Massachusetts facility was amended in September 2021 and pursuant to its amended terms, runs through 2025. Our Protein A amended supply agreement with Purolite was amended in October 2022 and, pursuant to its amended terms, runs through 2032. Our dual manufacturing capability provides strong business continuity and reduces overall supply risk for our ligand customers.

Significant Customers and Geographic Reporting

Customers for our bioprocessing products include major life sciences companies, contract manufacturing organizations, biopharmaceutical companies, diagnostics companies and laboratory researchers.

The following table represents the Company's total revenue by geographic area (based on the location of the customer):

	For the Years Ended December 31,		
	2024	2023	2022
Revenue by customers' geographic locations:			
North America	50%	44%	43%
Europe	34%	36%	37%
APAC/Other	16%	20%	20%
Total revenue	100%	100%	100%

There was no revenue from customers that represented 10% or more of the Company's total revenue for the years ended December 31, 2024, 2023 and 2022.

Human Capital

Employees

Repligen performs in a highly competitive industry and recognizes that our continued success hinges upon our ability to attract, develop and retain an inclusive team of talented individuals. We place high value on the satisfaction and well-being of our employees and operate with fair labor standards and industry-competitive compensation and benefits globally. As of December 31, 2024, we employed 1,778 full-time and part-time employees, a decrease of 5 since December 31, 2023. This total includes 334 employees in our commercial organization (273 field and 61 internal), 260 in engineering and R&D, 612 in manufacturing, 179 in quality, 89 in supply chain roles and 304 in administrative functions. Each of our employees has signed a confidentiality agreement. None of our U.S. employees are covered by collective bargaining agreements. We have one collective bargaining agreement with two unions that covers 75 employees in Sweden, comprising approximately 4% of our total workforce. We renewed this collective bargaining agreement in March 2023, and it expires at the end of March 2025. In France, 55 employees are under the relevant national and local collective bargaining agreements for metallurgy, comprising approximately 3% of our total workforce.

Code of Business Conduct and Ethics

Repligen is committed to conducting business in accordance with the highest ethical standards. This means how we conduct ourselves and our global work is more than just a matter of policy and law; it's a reflection of our core principles. Our Code of Business Conduct and Ethics reflects Repligen's five core principles – (1) trustworthiness, (2) respectfulness, (3) responsibility, (4) fairness and (5) corporate citizenship. Our Code of Business Conduct and Ethics applies to all Repligen employees, including those who are integrated into the Company through acquisitions. The full text of our Code of Business Conduct and Ethics is posted on our website and can be found at www.repligen.com.

Inclusive Workforce

Repligen maintains a resolute commitment to fostering an inclusive workplace. We have rigorous, established talent acquisition processes, as well as training and employee engagement resources, including inclusive workforce initiatives, to drive the principles of "belonging" for all employees at all levels of our organization starting with our Board of Directors ("Board") and our Leadership team.

We believe that our employees should reflect the communities in which we live, work, and serve. In our hiring practices, we strive to hire the most qualified person for the job by ensuring that qualified, inclusive slates of applicants are identified and considered for all roles within our workforce. As a result of our ongoing commitment to, and focus on, talent identification, recruitment, hiring, engagement, development, and succession planning, we have been particularly effective in building a strong workforce with a broad and deep talent pipeline.

Employee Engagement and Development

Our goal is to develop and maintain a talented, engaged and inclusive workforce that has a positive impact on our performance and on our customers. We regularly conduct engagement surveys to gain insight on employee perspectives. Additional channels for employee engagement include Company-wide all-hands meetings led by our Chief Executive Officer ("CEO") and site town halls ran by site leaders. We are committed to colleague recognition, which includes acknowledging, appreciating and celebrating each other's contributions and achievements. Our CEO-led all-hands meetings serve as a platform for CEO awards and platinum awards, which reward and recognize both teams and individual colleagues who have made significant and notable contributions to Repligen's success. We also offer a range of programs to develop our managers and enhance our leadership across the Company. Our professional development efforts are aimed at increasing organizational talent and capabilities as well as identifying and developing potential successors for key leadership positions.

Health, Safety and Well-Being

We actively promote the safety, health and well-being of our employees and end users of our products. Creating a culture where all employees feel supported and valued is paramount to our corporate mission. Our well-being goals are for employees to physically thrive, flourish mentally and emotionally, be socially connected and achieve financial security. We are proud to provide all of our full time employees in the United States with access to an employee assistance program ("EAP"). Our EAP offers employees and their eligible dependents counseling and well-being resources 24 hours a day, seven days a week by phone, online or via the mobile site. Our environmental health and safety policy advances our vision of zero workplace incidents and our efforts to reduce our environmental impacts.

Repligen Performance System

In 2022, we formalized the Repligen Performance System ("RPS"), to provide the tools and a framework for engaging employees across the organization to continuously improve operational performance, with a focus on product quality, customer lead times, material supply, production costs and sustainability. Through a standard implementation network, all teams were empowered to implement just-do-it process improvements, solve priority problems through stand-up meetings and improve key processes through kaizen events. We believe RPS improved our teams' ability to continuously resolve customer challenges, enhance product quality and improve operational efficiencies. The impact of RPS has been seen in productivity savings, customer lead-time reductions, manufacturing capacity expansions, product quality improvements and significant reductions in manufacturing scrap at several key sites. There are a number of programs setup using RPS over the next twelve months.

Sustainability - Environmental, Social and Governance Matters

Our Commitment to Sustainability

We believe our commitment to Environmental, Social and Governance ("ESG") topics across all our global facilities matters and is an important part of creating long-term business value for all stakeholders. We are deeply committed to corporate responsibility and transparency, and we continue to factor sustainability into our business decisions and integrate its core principles into our daily operations.

In establishing a formal approach to ESG, we joined the United Nations Global Compact in 2020 in support of its Ten Principles related to human rights, labor, the environment, and anti-corruption. The actions we have taken while building and implementing our robust ESG strategy demonstrate our long-term commitment to being a responsible global corporate citizen.

In preparation for our initial sustainability report, published in 2021, we formed a Corporate Responsibility Team ("CRT") with oversight by our Board. The CRT was headed by a member of our operations leadership team and represented multiple disciplines within the organization. We completed our first materiality assessment gleaning insights from internal and external stakeholders, and we established a financial grade ESG software platform to inform current and future ESG-related reporting and decisions.

Together, we are advancing our ESG initiatives at an ambitious pace and taking bold steps to engage stakeholders throughout our upstream and downstream value chain.

Our Reporting Frameworks

We have become an active participant in the sustainability reporting ecosystem through our alignment with the Greenhouse Gas Protocol and membership with the United Nations Global Compact ("UNGC"), the Global Reporting Initiative ("GRI") and the International Financial Reporting Standards Sustainability Alliance, which now includes the International Sustainability Standards Board standards. Sustainability Accounting Standards Board ("SASB") standards and Task Force on Climate-related Financial Disclosures ("TCFD") recommendations. In 2023, we completed our first CDP Climate and CDP Water surveys, and submitted our commitment letter to the Science Based Targets Initiative to develop a greenhouse gas emissions reduction plan aligned with the latest climate science.

With our 2023 sustainability report, "Advancing Impacts," which was published in December 2024 (the "2023 Sustainability Report"), we continued to disclose against internationally recognized reporting frameworks, including the Global Reporting Initiative (GRI) Universal Standard 2021 and the Sustainability Accounting Standards Board (SASB) standards. We have elevated our formalized reporting commitment by submitting our first Carbon Disclosure Project survey responses for Climate and Water (with 2022 data) using guidance from the GHG Protocol and the Task Force on Climate-related Financial Disclosures (TCFD). Additionally, as a signatory of the UNGC (since 2020), we also reinforced our commitment to the Ten Principles on human rights, labor, the environment and anti-corruption and integrated the seven Sustainable Development Goals identified as most relevant to our business into our reporting.

Oversight of ESG Matters

The Nominating and Corporate Governance ("N&CG") Committee of our Board oversees our ESG program. The N&CG Committee meets regularly and reviews and advises on ESG strategy and apprises the full Board in order to ensure that our ESG program and strategy align with the Company's mission. In addition, the Audit Committee of the Board regularly reviews ESG-related topics such as enterprise risk management, anti-corruption, ethics and compliance, supply chain management, human rights protections, and cybersecurity and data privacy.

The Head of Sustainability, under strategic direction of our CEO and Chief Operating Officer, is responsible for the development and implementation of our expanding ESG program. In collaboration with all key business functions, the mandate of this globally focused role is to consider our existing ESG initiatives, understand stakeholder perspectives, identify business-relevant areas of opportunity to make a positive impact on global ESG efforts, and work collaboratively to drive initiatives designed to accelerate our ESG progress and stretch our ESG ambition.

Intellectual Property

We are committed to protecting our intellectual property through a combination of patents, trade secrets, copyrights and trademarks, as well as confidentiality and material transfer agreements. As further described below, we own or have exclusive rights to at least 207 active patent grants and 142 pending patent applications in the United States and other foreign jurisdictions including Australia, Canada, China, France, Germany, India, Japan, South Korea, Sweden and the United Kingdom.

Our policy is to require each of our employees, consultants, business partners, potential collaborators and customers to execute confidentiality agreements upon the commencement of an employment, consulting, business relationship, or product related audit or research evaluation. These agreements provide that all confidential information developed or made known to the other party during the course of the relationship with us is to be kept confidential and not disclosed to third parties except in specific circumstances. In the case of employees and consultants, the agreements generally provide that all inventions conceived by the individual in the course of employment or rendering services to Repligen shall be our exclusive property and must be assigned to Repligen.

Filtration

For our filtration franchise, our patent grants include coverage for ATF filtration, TFDF and TFF HF and FS systems, membranes, filters, mixers, flow paths and single-use technologies. We continually seek to improve upon these technologies and have multiple new patent filings including patents covering next generation TFDF filters, next generation ATF filtration technologies, and proprietary reduced cost system components.

Through the Metenova Acquisition in 2023, our patent portfolio includes magnetic low shear mixers and carboy assemblies. These products bolster our upstream system capabilities.

Chromatography

Our patent grants include coverage for certain unique methods and features of our OPUS PPC, including methods of manufacturing column components, systems for removing air using specialized tubing and valve systems, medium recovery systems, methods for packing, as well as systems for testing chromatography columns. We strive to improve upon our chromatography technologies, including developing potentially disruptive technology related to gamma irradiated columns and resin packing methods.

Through the ARTeSYN Acquisition in 2020, our patent portfolio includes exo-technology, valves, integrated sensors and integrated flow path systems. We also have multiple patent grants pertaining to our single-use replacement valves and liners used in combination with our modular configurable encapsulated flow systems to provide sterilized flow paths for various bioprocessing applications.

Through the Tantti Acquisition in 2024, our patent portfolio includes macroporous resin and mirocarrier structures. These products permit alternative chromatography solutions by offering convective mass transport.

Process Analytics

Through our 2019 acquisition of C Technologies, Inc. (“C Technologies”), we hold patent grants to various slope spectroscopy instruments, including interactive variable pathlength devices and related methods of use. C Technologies’ scientists are continually developing new analytical tools using our state-of-the-art slope spectroscopy technology, for which we continue to file patent applications.

Proteins

We currently hold a patent grant for “Nucleic Acids Encoding Recombinant Protein A,” which claims sequences that encode a truncated recombinant Protein A but are otherwise identical to the natural Protein A, which is used for bioprocessing applications.

Pursuant to our collaboration with Navigo, we also have multiple patent grants and multiple pending patent applications globally covering Protein A-based affinity ligands through our collaboration with Navigo. These include ligands for antibody purification, as well as ligands for purifying COVID-19 vaccines.

In addition, following the acquisition of Avitide in September 2021, we continue to file multiple patent applications globally covering affinity ligands.

Trademarks

We procure and maintain trademark registrations globally for the Repligen trademark and our various product brands. We prioritize our "housemarks", (e.g., Repligen, the stylized "R" logo, Spectrum, TangenX, C Technologies, ARTeSYN, Polymem, Avitide, Metenova, etc.), and ensure continued protection globally. We also have trademark registrations for various product lines, including OPUS, XCell, XCell ATF, TFDF, KrosFlo, SIUS, ProConnex, Spectra/Por, NGL-Impact, SoloVPE, FlowVPE, FlowVPX, RPM, XO and AVIPure, that provide valuable company recognition and goodwill with our customers.

We have a comprehensive branding policy that includes trademark usage guidelines to ensure Repligen trademarks are used in accordance with our worldwide registrations and we actively police any unauthorized trademark usage as well as enforce the rights we have under our trademarks.

Licensing Agreements

We have entered into multiple licensing and collaboration relationships with third-party business partners in an effort to fully exploit our technology and advance our bioprocessing business strategy. For example, we entered into a 15-year exclusive License Agreement with Daylight (the "Daylight Agreement"), giving us exclusive license and commercialization rights to use certain technology and intellectual property subject to conditions set forth in the Daylight Agreement. See Note 14, "*Commitments and Contingencies*" to our consolidated financial statements included in this report for more information on this license agreement.

Competition

Our bioprocessing products compete on the basis of value proposition, performance, quality, cost effectiveness, and application suitability with numerous established technologies. Additional products using new technologies that may be competitive with our products may also be introduced. Many of the companies selling or developing competitive products have greater financial and human resources, and greater R&D, manufacturing and marketing experience than we do. They may undertake their own development of products that are substantially similar to or compete with our products and they may succeed in developing products that are more effective or less costly than any that we may develop. These competitors may also prove to be more successful in their production, marketing and commercialization activities. We cannot be certain that the research, development and commercialization efforts of our competitors will not render any of our existing or potential products obsolete.

Manufacturing

A majority of our 16 manufacturing sites are located in the United States (California, Massachusetts, New Hampshire, New Jersey, and New York). Outside the United States, we have manufacturing sites in Estonia, France, Germany, Ireland, the Netherlands, Sweden, and Taiwan.

The protein products we provide are manufactured at our sites in Waltham, Massachusetts and Lund, Sweden. Native Protein A ligands and our growth factor products are manufactured in Lund, while recombinant Protein A ligands are manufactured in both Waltham and Lund. Our primary chromatography assembly and manufacturing sites are located in Waltham, Massachusetts, Ravensburg, Germany and Breda, the Netherlands. Our primary filtration manufacturing sites, including manufacturing of fluid management systems, products and consumables, are located in Marlborough, Massachusetts; Rancho Dominguez, California; Clifton Park, New York; Auburn, Massachusetts; Waterford, Ireland; Juri, Estonia and Toulouse, France. Our facility in Marlborough, is focused on XCell ATF, FS TFF, Spectrum HF products, while in Rancho Dominguez the focus is on Spectrum HF, TFDF and ProConnex products. Our process analytics products are manufactured in Bridgewater, New Jersey.. As part of our capacity expansion activities, we have added a site in Hopkinton, Massachusetts that serves as an assembly center for single-use products and the capacity to manufacture our protein products. With our six acquisitions since the beginning of 2021, we gained manufacturing sites in Molndal, Sweden (Metenova), Toulouse, France (Polymem), Lebanon, New Hampshire (Avitide), and Taoyuan City, Taiwan (Tantti). We undertook restructuring activities in 2023 that continued into 2024 and included consolidating a portion of our manufacturing operations between certain U.S. locations and discontinuing the sale of certain product SKUs. In addition, we continuously evaluate the net realizable value of finished goods and raw materials, including those secured during the 2020-2022 pandemic period. As a result of these activities, we closed manufacturing sites in Newton, New Jersey, Branchburg, New Jersey, Dallas Texas, Simi Valley, California, and Oceanside, California.

We utilize our facilities in Waltham, Massachusetts and Lund, Sweden to carry out fermentation and recovery operations, and purification, immobilization, packaging and quality control testing of our protein-based bioprocessing products. Our facilities located in Waltham, Massachusetts; Marlborough, Massachusetts; Lund, Sweden; Ravensburg, Germany; Bridgewater, New Jersey; Clifton Park, New York; and Rancho Dominguez, California among other sites, are ISO® 9001:2015 certified and maintain formal quality systems to maintain process control,

traceability, and product conformance. Additionally, our facilities in Irving, Texas and Auburn, Massachusetts are ISO® 13485:2016 certified. We practice continuous improvement initiatives based on routine internal audits as well as external feedback and audits performed by our partners and customers. In addition, we maintain a business continuity management system that focuses on key areas such as contingency planning, security stocks and off-site storage of raw materials and finished goods to ensure continuous supply of our products.

Available Information

We maintain a website with the address www.repligen.com. We are not including the information contained on our website as a part of, or incorporating it by reference into, this Form 10-K. We make available free of charge through our website our Form 10-Ks, Quarterly Reports on Form 10-Q and Current Reports on Form 8-K, including exhibits and amendments to these reports, as soon as reasonably practicable after we electronically file such materials with, or furnish such materials to, the Securities and Exchange Commission ("SEC"). We also provide corporate governance, such as our Code of Business Conduct and Ethics and other information, including our 2023 Sustainability Report, free of charge, through our website.

Our filings with the SEC may be accessed through the SEC's Electronic Data Gathering, Analysis and Retrieval system at www.sec.gov.

ITEM 1A. RISK FACTORS

Investors should carefully consider the risk factors described below before making an investment decision.

If any of the events described in the following risk factors occur, our business, financial condition or results of operations could be materially harmed. In that case, the trading price of our common stock could decline and investors may lose all or part of their investment. Additional risks and uncertainties that we are unaware of or that we currently deem immaterial may also become important factors that affect Repligen.

This Annual Report on Form 10-K ("Form 10-K") contains forward looking statements that involve risks and uncertainties. Our actual results could differ materially from those anticipated in these forward-looking statements as a result of certain factors, including the risks faced by us described below and elsewhere in this Form 10-K.

Risks Related to Our Business

We compete with life sciences, pharmaceutical and biotechnology companies that are capable of developing new approaches that could make our products and technology obsolete.

The bioprocessing market is intensely competitive, subject to rapid change and significantly affected by new product introductions and other market activities of industry participants.

We compete with several medium and small companies in each of our product categories as well as several large companies, including Danaher Corporation (Pall Corporation and Cytiva), Thermo Fisher Scientific Inc., MilliporeSigma and Sartorius. Many of our competitors are large, well-capitalized companies that may have greater financial, manufacturing, marketing, research and development ("R&D") resources than we have, as well as stronger name recognition, longer operating histories and benefits derived from greater economies of scale. As a consequence, they are able to spend more aggressively on product development, marketing, sales and other product initiatives than we can, and may have additional lines of products and the ability to bundle products.

These factors, among others, may enable our competitors to market their products at lower prices or on terms more advantageous to customers than what we can offer. Competition may result in price reduction, reduced gross margins and loss of market share, any of which could have a material adverse effect on our business, financial condition and results of operations.

Our current and future competitors, including certain of our customers, may at any time develop additional products that compete with our products. If any company develops products that compete with or are superior to our products, our revenue may decline. Additionally, new approaches by these competitors may make our products and technologies obsolete or noncompetitive.

If we are unable to continue to hire and retain skilled personnel, then we will have trouble developing and marketing our products.

Our success depends largely upon the continued service of our management and scientific staff and our ability to attract, retain and motivate highly skilled technical, scientific, management and marketing personnel. We also face significant competition in the hiring and retention of such personnel from other companies, research and academic institutions, government and other organizations that have superior funding and resources. The loss of key personnel or our inability to hire and retain skilled personnel could materially and adversely affect our product development efforts and our business.

Despite our increasingly diversified client base, we have historically depended on a limited number of customers for a high percentage of our revenues.

The loss of, or a significant reduction in orders from, any of our large customers, including following any termination or failure to renew a long-term supply contract, would significantly reduce our revenues and harm our results of operations. If a large customer purchases fewer of our products, defers orders or fails to place additional orders with us for any reason, including for business continuity purposes, our revenue could decline, and our operating results may not meet market expectations.

In addition, if our customers order our products, but fail to pay on time or at all, our liquidity and operating results could be materially and adversely affected. Furthermore, if any of our current or future products compete with those of any of our largest customers, these customers may place fewer orders with us or cease placing orders with us, which would negatively affect our revenues and operating results.

Certain of our products are used by customers in the production of gene therapies, which represent a relatively new and still-developing mode of treatment. Unforeseen adverse events, negative clinical outcomes, or increased regulatory scrutiny of cell and gene therapy ("C&GT") and its financial cost may damage public perception of the safety, utility, or efficacy of gene therapies and may harm our customers' ability to conduct their business. Such events may negatively impact our revenues and have an adverse effect on our performance.

C&GT remains a relatively new and developing treatment method, with only a limited number of gene therapies approved to date by regulatory authorities. Public perception may be influenced by claims that C&GT is unsafe or ineffective, and C&GT may not gain the acceptance of the public or the medical community. In addition, ethical, social, legal, and financial concerns about C&GT and genetic testing could result in additional regulations, limitations or even prohibitions on certain C&GTs or C&GT-related products. More restrictive regulations or negative public perception could reduce certain of our customers' use of our products, which could negatively affect our revenue and performance.

Risks Related to Product Development and Acquisitions

If we are unable to expand our product portfolio, our ability to generate revenue could be adversely affected.

We are increasingly seeking to develop and commercialize our portfolio of products. Our future financial performance will depend, in part, on our ability to successfully develop and acquire additional bioprocessing products. There is no guarantee that we will be able to successfully acquire or develop additional bioprocessing products, and our financial performance will likely suffer if we are unable to do so.

Our acquisitions expose us to risks that could adversely affect our business, and we may not achieve the anticipated benefits of acquisitions of businesses or technologies.

As a part of our growth strategy, we may make selected acquisitions of complementary products and/or businesses, such as our most recent acquisitions of Tantti Laboratory Inc., Metenova Holding AB and FlexBiosys, Inc. Any acquisition involves numerous risks and operational, financial, and managerial challenges, including the following, any of which could adversely affect our business, financial condition, or results of operations:

- difficulties in integrating new operations, technologies, products, and personnel;
- problems maintaining uniform procedures, controls and policies with respect to our financial accounting systems;
- lack of synergies or the inability to realize expected synergies and cost-savings;
- difficulties in managing geographically dispersed operations, including risks associated with entering foreign markets in which we have no or limited prior experience;
- underperformance of any acquired technology, product, or business relative to our expectations and the price we paid;
- negative near-term impacts on financial results after an acquisition, including acquisition-related earnings charges;
- the potential loss of key employees, customers, and strategic partners of acquired companies;
- claims by terminated employees and shareholders of acquired companies or other third parties related to the transaction;
- the assumption or incurrence of additional debt obligations or expenses, or use of substantial portions of our cash;
- the issuance of equity securities to finance or to use as consideration for any acquisitions that dilute the ownership of our stockholders;
- the issuance of equity securities to finance or to use as consideration for any acquisitions may not be an option if the price of our common stock is low or volatile which could preclude us from completing any such acquisitions;
- any collaboration, strategic alliance and licensing arrangement may require us to relinquish valuable rights to our technologies or product candidates, or grant licenses on terms that are not favorable to us;
- diversion of management's attention and company resources from existing operations of the business;
- inconsistencies in standards, controls, procedures, and policies;
- assumption of, or exposure to, historical liabilities of the acquired business, including unknown contingent or similar liabilities that are difficult to identify or accurately quantify; and
- risks associated with acquiring intellectual property, including potential disputes regarding acquired companies' intellectual property.

In addition, the successful integration of acquired businesses requires significant efforts and expense across all operational areas, including sales and marketing, R&D, manufacturing, finance, legal, and information technologies. There can be no assurance that any of the acquisitions we may make will be successful or will be, or will remain, profitable. Our failure to successfully address the foregoing risks may prevent us from achieving the anticipated benefits from any acquisition in a reasonable time frame, or at all.

If intangible assets and goodwill that we recorded in connection with our acquisitions become impaired, we may have to take significant charges against earnings.

In connection with the accounting for our completed acquisitions, we recorded a significant amount of intangible assets, including developed technology and customer relationships relating to the acquired product lines, and goodwill. Under accounting principles generally accepted in the United States, we must assess, at least annually and potentially more frequently, whether the value of intangible assets and goodwill has been impaired. Intangible assets and goodwill will be assessed for impairment in the event of an impairment indicator. Any reduction or impairment of the value of intangible assets and goodwill will result in a charge against earnings, which could materially adversely affect our results of operations and shareholders' equity in future periods.

Risks Related to Manufacturing and Supply

If we are unable to manufacture our products in sufficient quantities and in a timely manner, our operating results will be harmed, our ability to generate revenue could be diminished and our gross margin may be negatively impacted.

Our revenues and other operating results will depend in large part on our ability to manufacture and assemble our products in sufficient quantities and in a timely manner. Any interruptions we experience in the manufacturing or shipping of our products could delay our ability to recognize revenues in a particular quarter. Manufacturing problems can and do arise, and as demand for our products increases, any such problems could have an increasingly significant impact on our operating results. While we have not generally experienced problems with, or delays in, our production capabilities that resulted in delays in our ability to ship finished products, there can be no assurance that we will not encounter such problems in the future. We may not be able to quickly ship products and recognize anticipated revenues for a given period if we experience significant delays in the manufacturing process. In addition, we must maintain sufficient production capacity in order to meet anticipated customer demand, which carries fixed costs that we may not be able to offset if orders were to slow, which would adversely affect our operating margins. If we are unable to manufacture our products consistently, in sufficient quantities, and on a timely basis, our bioprocessing revenue, gross margins and our other operating results will be materially and adversely affected.

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

There are only a limited number of suppliers of materials for certain of our products. An interruption in operations of the business related to these products could occur if we encounter delays or difficulties in securing the required materials, or if we cannot then obtain an acceptable substitute. Any such interruption could significantly affect the business related to these products and our financial condition, results of operations and reputation. For example, we believe that only a small number of suppliers are currently qualified to supply materials for the XCell ATF® systems. The use of materials furnished by these replacement suppliers would require us to alter our operations related to the XCell ATF systems. Transitioning to a new supplier for our products would be time-consuming and expensive, may result in interruptions in our operations, could affect the performance specifications of our product lines or could require that we revalidate the materials.

There can be no assurance that we will be able to secure alternative materials and bring such materials online and revalidate them without experiencing interruptions in our workflow. If we should encounter delays or difficulties in securing, reconfiguring or revalidating the materials required for our products, our business related to these products and our financial condition, results of operations and reputation could be adversely affected.

Risks Related to Our Financial Position and Need for Additional Capital

Servicing our debt will require a significant amount of cash, and we may not have sufficient cash flow from our business to make payments on our debt and we may not have the ability to raise the funds necessary to settle for cash conversions of our Notes or to repurchase the Notes for cash upon a fundamental change, which could adversely affect our business and results of operations.

In December 2023, we incurred significant indebtedness with the issuance of $600.0 million in aggregate principal amount of 1.00% Convertible Senior Notes due 2028 (the "2023 Notes") where $309.9 million principal amount of the 2023 Notes were issued in exchange for $217.7 million principal amount of our 0.375% Convertible Senior Notes due 2024 (the "2019 Notes", and together with the 2023 Notes, the "Notes") and $290.1 million principal amount of the 2023 Notes were issued for $290.1 million in cash. As of December 31, 2024, $600.0 million in aggregate principal amount of the 2023 Notes remain outstanding. Our ability to make scheduled payments of the principal of, to pay interest on, or to refinance our indebtedness, including the Notes, depends on our future performance, which is subject to economic, financial, competitive and other factors that may be beyond our control. Our business may not continue to generate cash flow from operations in the future sufficient to service our debt and make necessary capital expenditures. If we are unable to generate such cash flow, we may be required to adopt one or more alternatives, such as selling assets, restructuring debt or obtaining additional equity capital on terms that may be onerous or highly dilutive. Our ability to refinance our indebtedness will depend on the capital markets and our financial condition at such time. We may not be able to engage in any of these activities or engage in these activities on desirable terms, which could result in a default on our debt obligations, including the Notes.

In addition, holders of the Notes have the right, subject to certain conditions, to require us to repurchase all or any portion of their Notes upon the occurrence of a "fundamental change" (as defined in the indentures governing the Notes) at a fundamental change repurchase price equal to 100% of the principal amount of the Notes to be repurchased, plus accrued and unpaid interest, if any, but excluding the fundamental change repurchase date. Upon any conversion of Notes, we will also be required to make cash payments for each $1,000 principal amount of 2023 Notes converted of at least the lesser of $1,000 and the sum of the "daily conversion values" (as defined in the indenture governing the 2023 Notes). However, we may not have enough available cash or be able to obtain financing at the time we are required to make repurchases of Notes surrendered therefor or pay cash with respect to Notes being converted. In addition, our ability to repurchase the Notes or to pay cash upon conversions of the Notes may be limited by law, by regulatory authority or by agreements governing our future indebtedness. Our failure to repurchase Notes at a time when the repurchase is required by the applicable indenture or to pay any cash payable on future conversions of the Notes as required by the applicable indenture would constitute a default under such indenture. A default under either indenture governing the Notes or the fundamental change itself could also lead to a default under agreements governing our future indebtedness. If the repayment of the related indebtedness were to be accelerated after any applicable notice or grace periods, we may not have sufficient funds to repay the indebtedness and repurchase the Notes or make cash payments upon conversions thereof.

In addition, our significant indebtedness, combined with our other financial obligations and contractual commitments, could have other important consequences. For example, it could:

- make us more vulnerable to adverse changes in general U.S. and worldwide economic, industry and competitive conditions and adverse changes in government regulation;
- limit our flexibility in planning for, or reacting to, changes in our business and our industry;
- place us at a disadvantage compared to our competitors who have less debt; and
- limit our ability to borrow additional amounts for working capital and other general corporate purposes, including to fund possible acquisitions of, or investments in, complementary businesses, products, services and technologies.

Any of these factors could materially and adversely affect our business, financial condition and results of operations. In addition, if we incur additional indebtedness, the risks related to our business and our ability to service or repay our indebtedness would increase.

The conditional conversion feature of the Notes, if triggered, may adversely affect our financial condition and liquidity.

In the event the conditional conversion feature of the Notes is triggered, holders of Notes will be entitled to convert the Notes at any time during specified periods at their option, as described in the indentures governing the Notes. If one or more holders elect to convert their Notes, we would be required to settle any converted principal through the payment of cash, which could adversely affect our liquidity. In addition, even if holders do not elect to convert their Notes, we could be required under applicable accounting rules to reclassify all or a portion of the outstanding principal of the notes as a current rather than long-term liability, which would result in a material reduction of our net working capital.

Future strategic transactions or acquisitions may require us to seek additional financing, which we may not be able to secure on favorable terms, if at all.

We plan to continue a strategy of growth and development for our bioprocessing business, and we actively evaluate various strategic transactions on an ongoing basis, including licensing or acquiring complementary products, technologies or businesses that would complement our existing portfolio of development programs. In order to complete such strategic transactions, we may need to seek additional financing to fund these investments and acquisitions. Should we need to do so, we may not be able to secure such financing, or obtain such financing on favorable terms because of the volatile nature of the biotechnology marketplace. In addition, future acquisitions may require the issuance or sale of additional equity or debt securities, which may result in additional dilution to our stockholders.

Our corporate restructuring and the associated headcount reduction may not result in anticipated savings, could result in total costs and expenses that are greater than expected and could disrupt our business.

In July 2023, our Board of Directors ("Board") authorized the Company's management team to undertake restructuring activities to simplify and streamline our organization and strengthen the overall effectiveness of our operations (the "Restructuring Plan"). As part of the Restructuring Plan, we consolidated a portion of our manufacturing business between certain U.S. locations and reduced our headcount. We may not realize, in full or in part, the anticipated benefits, savings and improvements in our cost structure from our restructuring efforts due to unforeseen difficulties, delays or unexpected costs. If we are unable to realize the expected operational efficiencies and cost savings from the Restructuring Plan, our operating results and financial condition could be adversely affected. Furthermore, the Restructuring Plan may be disruptive to our operations. Further restructuring and cost-cutting activities may be required and could yield unintended consequences and costs, such as a reduction in morale among our remaining employees, adverse effects to our reputation as both an employer and with respect to customers, the loss of institutional knowledge and expertise, and increased likelihood of turnover of key members of management and employees, all of which can impede our ability to successfully implement our business strategy, and consequently, our business, financial condition, and results of operations could be materially and adversely affected.

Our exposure to political, economic and other risks that arise from operating a multinational business has and may continue to increase.

We operate on a global basis with offices or activities in Japan, South Korea, China, India, Taiwan, Europe and North America. Our operations and sales outside of the United States have increased as a result of our strategic acquisitions and the continued expansion of our commercial organization. Risks related to these increased foreign operations include:

- fluctuations in foreign currency exchange rates, which may affect the costs incurred in international operations and foreign acquisitions and could harm our results of operations and financial condition;
- changes in general economic and political conditions in countries where we operate, particularly as a result of ongoing economic instability within foreign jurisdictions;
- the occurrence of a trade war, or other governmental action related to tariffs or trade agreements;
- differing protection of intellectual property, technology and data in foreign jurisdictions;
- difficulty in staffing and managing widespread operations;
- being subject to complex and restrictive employment and labor laws and regulations, as well as union and works council restrictions;
- changes in tax laws or rulings in the United States or other foreign jurisdictions that may have an adverse impact on our effective tax rate;
- being subject to burdensome foreign laws and regulations, including regulations that may place an increased tax burden on our operations;

- being subject to longer payment cycles from customers and experiencing greater difficulties in timely accounts receivable collections; and
- required compliance with a variety of foreign laws and regulations, such as data privacy requirements, real estate and property laws, anti-competition regulations, import and trade restrictions, export requirements, U.S. laws such as the Foreign Corrupt Practices Act of 1977 (the "FCPA") and the U.S. Department of Commerce's Export Administration Regulations, and other U.S. federal laws and regulations established by the Office of Foreign Assets Control, local laws such as the U.K. Bribery Act of 2010 or other local laws that prohibit corrupt payments to governmental officials or certain payments or remunerations to customers.

Our business success depends in part on our ability to anticipate and effectively manage these and other related factors. We cannot assure you that these and other related factors will not materially adversely affect our international operations or business as a whole.

In addition, a deterioration in diplomatic relations between the United States and any country where we conduct business could adversely affect our future operations and lead to a decline in profitability.

We may be unable to efficiently manage our growth as a larger and more geographically expansive organization.

Our strategic acquisitions, the continued expansion of our commercial sales operations, and our organic growth have increased the scope and complexity of our business. As a result, we will face challenges inherent in efficiently managing a more complex business with an increased number of employees over large geographic distances, including the need to implement appropriate systems, policies, benefits and compliance programs. Our inability to manage successfully the geographically and culturally expansive, and substantially larger combined organization could materially adversely affect our operating results and, as a result, the market price of our common stock.

Our results of operations could be negatively affected by potential fluctuations in foreign currency exchange rates.

We conduct a large portion of our business in international markets. For the fiscal year ended December 31, 2024, 37.0% of our revenues were denominated in foreign currencies with the primary foreign currency exposures being the Swedish krona, Euro and Chinese yuan. We are exposed to the risk of an increase or decrease in the value of the foreign currencies relative to the U.S. dollar, which could decrease the value of our revenue and increase the value of our expenses and costs when measured in U.S. dollars. These fluctuations could also adversely affect the demand for products and services provided by us. As a result, our results of operation may be influenced by the effects of future exchange rate fluctuations and such effects may have an adverse impact on our common stock price.

Natural disasters, geopolitical unrest, war, terrorism, public health issues or other catastrophic events could disrupt the supply, delivery or demand of products, which could negatively affect our operations and performance.

We are subject to the risk of disruption by earthquakes, floods and other natural disasters, fire, power shortages, geopolitical unrest, war, terrorist attacks and other hostile acts, public health issues, epidemics or pandemics and other events beyond our control and the control of the third parties on which we depend. Any of these catastrophic events may have a strong negative impact on our employees, facilities, partners, suppliers, distributors or customers, and could decrease demand for our products, create delays and inefficiencies in our supply chain and make it difficult or impossible for us to deliver products to our customers.

In addition, a catastrophic event that results in the destruction or disruption of our data centers or our critical business or information technology systems would severely affect our ability to conduct normal business operations and, as a result, our operating results would be adversely affected.

Our business, financial condition and results from operations could be adversely affected by disruptions in the global economy caused by geopolitical events, such as the ongoing conflicts between Russia and Ukraine and Israel and Palestine.

Global conflicts could increase costs and limit availability of fuel, energy, and other resources we depend upon for our business operations. For example, while we do not operate in Russia or Ukraine, the increasing tensions between the United States and Russia and the other effects of the ongoing conflict of Ukraine, have resulted in many broader economic impacts such as the United States and European Union imposing sanctions and bans against Russia and Russian products imported into the United States and Europe, respectively. Such sanctions and bans have impacted and may continue to impact commodity pricing such as fuel and energy costs, making it more expensive for us and our partners to deliver products to our customers. Further sanctions, bans or other economic actions in response to the ongoing conflict between Russia and Ukraine or in response to any other global conflict such as the ongoing conflict between Israel and Palestine, could result in, among other things, cyber-attacks, supply disruptions, lower consumer demand, and changes to foreign exchange rates and financial markets, any of which may adversely affect our business and supply chain. In addition, the effects of the ongoing conflict could heighten many of our known risks described in this section.

Adverse developments affecting the financial services industry, such as actual events or concerns involving liquidity, defaults, or non-performance by financial institutions or transactional counterparties, could adversely affect our current and projected business operations and our financial condition and results of operations.

Actual events involving limited liquidity, defaults, non-performance or other adverse developments that affect financial institutions, transactional counterparties or other companies in the financial services industry or the financial services industry generally, or concerns or rumors about any events of these kinds or other similar risks, have in the past and may in the future lead to market-wide liquidity problems. For example, on March 10, 2023, Silicon Valley Bank ("SVB") was closed by the California Department of Financial Protection and Innovation, which appointed the Federal Deposit Insurance Corporation ("FDIC") as receiver. Similarly, on March 12, 2023, Signature Bank and Silvergate Capital Corp. were each swept into receivership. If any of our lenders or counterparties to any such instruments were to be placed into receivership, we may be unable to access such funds. We have a banking relationship with SVB and hold cash, cash equivalents and marketable securities of $0.3 million as of December 31, 2024 in SVB depository accounts to cover short-term operational payments. While we have not experienced any losses in such accounts, the recent failure of SVB caused us to utilize our accounts at other financial institutions in order to mitigate potential operational risks stemming from the temporary inability to access funds in our SVB operating accounts. In addition, if any of our customers, suppliers or other parties with whom we conduct business are unable to access funds pursuant to such instruments or lending arrangements with such a financial institution, such parties' ability to pay their obligations to us or to enter into new commercial arrangements requiring additional payments to us could be adversely affected.

Inflation and rapid increases in interest rates have led to a decline in the trading value of previously issued government securities with interest rates below current market interest rates. Although the U.S. Department of Treasury, FDIC and Federal Reserve Board have announced a program to provide up to $25 billion of loans to financial institutions secured by certain of such government securities held by financial institutions to mitigate the risk of potential losses on the sale of such instruments, widespread demands for customer withdrawals or other liquidity needs of financial institutions for immediately liquidity may exceed the capacity of such program. Additionally, there is no guarantee that the U.S. Department of Treasury, FDIC and Federal Reserve Board will provide access to uninsured funds in the future in the event of the closure of other banks or financial institutions, or that they would do so in a timely fashion.

Although we assess our banking and customer relationships as we believe necessary or appropriate, our access to funding sources and other credit arrangements in amounts adequate to finance or capitalize our current and projected future business operations could be significantly impaired by factors that affect the Company, the financial institutions with which the Company has credit agreements or arrangements directly, or the financial services industry or economy in general. These factors could include, among others, events such as liquidity constraints or failures, the ability to perform obligations under various types of financial, credit or liquidity agreements or arrangements, disruptions or instability in the financial services industry or financial markets, or concerns or negative expectations about the prospects for companies in the financial services industry. These factors could involve financial institutions or financial services industry companies with which the Company has financial or business relationships, but could also include factors involving financial markets or the financial services industry generally. The results of events or concerns that involve one or more of these factors could include a variety of material and adverse impacts on our current and projected business operations and our financial condition and results of operations.

In addition, investor concerns regarding the U.S. or international financial systems could result in less favorable commercial financing terms, including higher interest rates or costs and tighter financial and operating covenants, or systemic limitations on access to credit and liquidity sources, thereby making it more difficult for us to acquire financing on acceptable terms or at all. Any decline in available funding or access to our cash and liquidity resources could, among other risks, adversely impact our ability to meet our operating expenses, financial obligations or fulfill our other obligations, result in breaches of our financial and/or contractual obligations or result in violations of federal or state wage and hour laws. Any of these impacts, or any other impacts resulting from the factors described above or other related or similar factors not described above, could have material adverse impacts on our liquidity and our current and/or projected business operations and financial condition and results of operations.

In addition, any further deterioration in the global economy or financial services industry, including but not limited to the change in the U.S. presidential administration, or increased U.S. trade tariffs and trade disputes with other countries could lead to losses or defaults by our suppliers, which in turn, could have a material adverse effect on our current and/or projected business operations and results of operations and financial condition. For example, increased tariffs on essential materials could raise production costs and reduce profitability if we are unable to pass these costs on to customers. Additionally, retaliatory trade measures by other countries could limit our access to key international markets, restricting revenue growth. Any delays or disruptions in our supply chain due to geopolitical tensions, regulatory changes, or trade disputes could adversely affect our ability to manufacture and deliver products, potentially impacting our financial performance and customer relationships.

Risks Related to Ownership of Our Common Stock

Risks Related to Investment in Our Securities

Our operating results may fluctuate significantly, our customers' future purchases are difficult to predict and any failure to meet financial expectations may result in a decline in our stock price.

Our quarterly operating results may fluctuate in the future due to many factors, such as the impact of seasonal spending patterns, changes in overall spending levels in the life sciences industry, the inability of some of our customers to consummate anticipated purchases of our products due to changes in end-user demand, and other unpredictable factors that may affect ordering patterns. Because our revenue and operating results are difficult to predict, we believe that our past results of operations are not necessarily a good indicator of our future performance. Additionally, if revenue declines in a quarter, whether due to a delay in recognizing expected revenue, adverse economic conditions or otherwise, our results of operations will be harmed because many of our expenses are relatively fixed. In particular, a large portion of our manufacturing costs, our R&D, sales and marketing and general and administrative expenses are not significantly affected by variations in revenue. Further, our gross margins are dependent on product mix. A shift in sales away from our higher-margin products to lower margin products will adversely affect our gross margins. If our quarterly operating results fail to meet investor expectations, the price of our common stock may decline.

Securities or industry analysts may not publish favorable research or reports about our business or may publish no information, which could cause our stock price or trading volume to decline.

The trading market for our common stock is influenced by the research and reports that industry or securities analysts publish about us and our business. We do not have any control over these analysts, and we cannot provide any assurance that analysts will cover us or provide favorable coverage. If any of the analysts who cover us issue an adverse opinion regarding our stock price, our business or stock price would likely decline. If one or more of these analysts cease coverage of our company or fail to regularly publish reports covering us, we could lose visibility in the market, which in turn could cause our stock price or trading volume to decline.

Our stock price could be volatile, which could cause shareholders to lose part or all of their investment.

The market price of our common stock, like that of the common stock of many other companies with similar market capitalizations, is highly volatile. The stock market in general, and the market for life sciences, biotechnology and pharmaceutical companies in particular, have experienced extreme price and volume fluctuations that have often been unrelated or disproportionate to the operating performance of specific companies, the conflict in Ukraine and Israel, and rising inflation and interest rates in the United States, which have resulted in decreased stock prices for many companies notwithstanding the lack of a fundamental change in their underlying business models or prospects. Broad market and industry factors, including potentially worsening economic conditions, may adversely affect the market price of our common stock, regardless of our actual operating performance.

We have identified material weaknesses in our internal control over financial reporting and may identify additional material weaknesses in the future or otherwise fail to maintain effective internal control over financial reporting, which may result in a material misstatement of our consolidated financial statements or cause us to fail to meet our periodic reporting obligations.

Effective internal controls are necessary to provide reliable financial reports and to assist in the effective prevention of fraud. Any inability to provide reliable financial reports or prevent fraud could harm our business. We regularly review and update our internal controls, disclosure controls and procedures, and corporate governance policies. In addition, we are required under the Sarbanes-Oxley Act of 2002 to report annually on our internal control over financial reporting. Any system of internal controls, however well designed and operated, is based in part on certain assumptions and can provide only reasonable, not absolute, assurances that the objectives of the system are met, including objectives that may involve our reliance on third-party advisors and professionals

As discussed below in Part II, Item 9A, "Controls and Procedures," of this report, we have identified material weaknesses in our internal control over financial reporting related to (i) controls related to revenue recognition specific to the evaluation of accounting for contract terms, (ii) information technology ("IT") general controls for information systems that are relevant to the preparation of our financial statements, and (iii) business process-level controls related to inventory valuation and the financial statement close process either in a timely manner or with an appropriate precision threshold. As a result of these material weaknesses, our management concluded that our internal control over financial reporting was not effective as of December 31, 2024.

Following identification of these material weaknesses, and as part of our commitment to strengthen our internal control over financial reporting, we are implementing remedial actions under the oversight of the Audit Committee of our Board to address these deficiencies. Our remediation activities will include the following:

Our remediation activities include the following with respect to revenue recognition:

- Designing and implementing new internal controls to validate there is a complete listing of revenue contracts that have non-standard terms, which require incremental accounting analysis under ASC 606.
- Designing and implementing new internal controls evaluating the accounting for contract amendments, including amendments accounted for as contract modifications.
- Enhancing and expanding our existing revenue recognition control procedures and attributes when evaluating the accounting impact of non-standard contract terms and contract modifications.
- Increased education for internal resources on accounting for contracts within the scope of ASC 606 and deploying enablers to facilitate documentation of accounting analyses and conclusions.

Our remediation activities will include the following with respect to IT general controls:

- Reassessing the operating effectiveness of internal controls related to the program and data change management and user access processes; and
- Expanding the management and governance over IT system controls.

Our remediation activities will include the following with respect to certain business process-level controls:

- Reassessing the operating effectiveness of these controls, including precision thresholds, timely execution, and documentation requirements for control owners;
- Assessing the frequency of our control monitoring activities to ensure that they are conducted in a timely manner; and
- Hiring additional staff, including external experts, to enhance the performance, documentation, and monitoring of such controls. This includes providing training for control owners setting out expectations as it relates to the control risk and design, execution and monitoring of such controls, including enhancements to the documentation to evidence the execution of the control.

We will continue to monitor the design and operating effectiveness of these and other processes, procedures and controls and make any further changes management determines appropriate. While we are undertaking efforts to remediate these material weaknesses, the material weaknesses will not be considered remediated until our remediation plan has been fully implemented, the applicable controls operate for a sufficient period of time, and we have concluded, through testing, that the newly implemented and enhanced controls are operating effectively. At this time, we cannot predict the success of such efforts or the outcome of our assessment of the remediation efforts. We can give no assurance that our efforts will remediate these material weaknesses in our internal control over financial reporting, or that additional material weaknesses will not be identified in the future. The effectiveness of our internal control over financial reporting is subject to various inherent limitations, including cost limitations, judgments used in decision making, assumptions about the likelihood of future events, the possibility of

human error and the risk of fraud. If we are unable to remediate the material weaknesses, our ability to record, process and report financial information accurately, and to prepare the consolidated financial statements within the time periods specified by the rules and regulations of the SEC, could be adversely affected which, in turn, may adversely affect our reputation and business and the trading price of our common stock.

Any failure to implement new or improved controls, or difficulties encountered in their implementation, could result in errors in our consolidated financial statements that could result in a restatement of our financial statements and could cause us to fail to meet our reporting obligations, any of which could diminish investor confidence in us and cause a decline in the price of our common stock. In addition, any such failures could result in litigation or regulatory actions by the SEC or other regulatory authorities, loss of investor confidence, delisting of our securities and harm to our reputation and financial condition, or diversion of financial and management resources from the operation of our business.

The restatement of our previously issued financial statements may affect stockholder and investor confidence in us or harm our reputation, and may subject us to additional risks and uncertainties, including increased costs and the increased possibility of legal proceedings and regulatory inquiries, sanctions or investigations

Upon identifying the revenue recognition material weakness described above, we amended and restated certain items in our Quarterly Reports on Form 10-Q for the fiscal quarters ended March 31, 2023 through June 30, 2024, as well as certain items in our Annual Report on Form 10-K for the fiscal year ended December 31, 2023. As a result of this restatement, we have incurred, and may continue to incur, unanticipated costs for accounting and legal fees in connection with, or related to, such restatement. In addition, such restatements could subject us to a number of additional risks and uncertainties, including the increased possibility of legal proceedings and inquiries, sanctions or investigations by the SEC or other regulatory authorities. Any of the foregoing may adversely affect our reputation, the accuracy and timing of our financial reporting, or our business, results of operations, liquidity and financial condition, or cause stockholders, investors, members and customers to lose confidence in the accuracy and completeness of our financial reports or cause the market price of our common stock to decline. As of the date of this Form 10-K, we have no knowledge of any such legal proceedings and regulatory inquiries, sanctions or investigation. However, we can provide no assurance that such legal proceedings and regulatory inquiries, sanctions or investigation will not arise in the future. Any such legal proceedings and regulatory inquiries, sanctions or investigation, whether successful or not, could adversely affect our business, financial condition and results of operations.

Risks Related to Our Charter and Bylaws

Anti-takeover provisions in our charter documents, certain of our contracts with third parties, and under Delaware law could make an acquisition of us, even one that may be beneficial to our stockholders, more difficult and may prevent attempts by our stockholders to replace or remove our current management.

Provisions in our certificate of incorporation and by-laws may delay or prevent an acquisition of us or a change in our management. These provisions include the ability of our Board to issue preferred stock without stockholder approval. In addition, because we are incorporated in Delaware, we are governed by the provisions of Section 203 of the Delaware General Corporation Law, which limits the ability of stockholders owning in excess of 15% of our outstanding voting stock to merge or combine with us. Although we believe these provisions collectively provide for an opportunity to obtain greater value for stockholders by requiring potential acquirers to negotiate with the Board, they would apply even if an offer rejected by our board was considered beneficial by some stockholders. Additionally, certain of our contracts with third parties allow for termination upon specified change of control transactions. Anti-takeover 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 the Board, which is responsible for appointing the members of our management, and anti-takeover or change of control contract termination rights may frustrate or prevent any attempts by a third-party to acquire or attempt to acquire us.

Risks Related to Tax Matters

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, or interpretations thereof, could materially impact our 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 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. There is no assurance that our actual income tax liability will not be materially different than what is reflected in our income tax (benefit) provisions and accruals as a result of changes in tax laws.

In addition, many countries are beginning to implement legislation and other guidance to align their international tax rules with the Organisation 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. Because of the heightened scrutiny of corporate taxation policies, prior decisions by tax authorities regarding treatments and positions of corporate income taxes could be subject to enforcement activities, and legislative investigation and inquiry, which could also result in changes in tax policies or prior tax rulings. Any such changes in policies or rulings may also result in the taxes we previously paid being subject to change.

Due to the large scale of our international business activities, any substantial changes in international corporate tax policies, enforcement activities or legislative initiatives may materially adversely affect our business, the amount of taxes we are required to pay and our financial condition and results of operations generally.

Our ability to use net operating loss and tax credit carryforwards and certain built-in losses to reduce future tax payments is limited by provisions of the Internal Revenue Code, and it is possible that certain transactions or a combination of certain transactions may result in material additional limitations on our ability to use our net operating loss and tax credit carryforwards.

Section 382 and 383 of the Internal Revenue Code of 1986, as amended, contain rules that limit the ability of a company that undergoes an ownership change, which is generally any change in ownership of more than 50 percentage points of its stock over a three-year period, to utilize its net operating loss and tax credit carryforwards and certain built-in losses recognized in years after the ownership change. These rules generally operate by focusing on ownership changes involving stockholders owning directly or indirectly 5% or more of the stock of a company and any change in ownership arising from a new issuance of stock by the company. Generally, if an ownership change occurs, the yearly taxable income limitation on the use of net operating loss and tax credit carryforwards and certain built-in losses is equal to the product of the applicable long-term, tax-exempt rate and the value of the company's stock immediately before the ownership change. We may be unable to offset our taxable income with losses, or our tax liability with credits, before such losses and credits expire and therefore would incur larger federal income tax liability. Federal net operating losses generated after December 31, 2017, are not subject to expiration and generally may not be carried back to prior taxable years except that, under the Coronavirus Aid, Relief, and Economic Security Act, net operating losses generated in 2018, 2019 and 2020 may be carried back five taxable years. Additionally, for taxable years beginning after December 31, 2020, the deductibility of such deferral net operating losses is limited to 80% of our taxable income in any future taxable year.

Risks Related to Government Regulation

Risks Related to Regulations and Compliance

We are subject to export and import control laws and regulations that could impair our ability to compete in international markets or subject us to liability if we violate such laws and regulations.

We are subject to U.S. export controls and sanctions regulations that restrict the shipment or provision of certain products and services to certain countries, governments, and persons. While we take precautions to prevent our products and services from being exported in violation of these laws, we cannot guarantee that the precautions we take will prevent violations of export control and sanctions laws. We believe that, in the past, we and our subsidiaries may have exported certain products without a required export license in apparent violation of U.S. export control laws. As a result, we have submitted to the U.S. Department of Commerce's Bureau of Industry and Security various notices of voluntary self-disclosure concerning potential violations. If we are found to be in violation of U.S. sanctions or export control laws, it could result in substantial fines and penalties for us and for the individuals working for us. We may also be adversely affected through other penalties, reputational harm, loss of access to certain markets, or otherwise.

Complying with export control and sanction regulations may be time-consuming and may result in the delay or loss of sales opportunities or impose other costs. Any change in export or import regulations, economic sanctions or related legislation, or change in the countries, governments, persons or technologies targeted by such regulations, could result in our decreased ability to export or sell certain products to existing or potential customers in affected jurisdictions.

Our business is subject to a number of environmental risks.

Our manufacturing business involves the controlled use of hazardous materials and chemicals and is therefore subject to numerous environmental and safety laws and regulations and periodic inspections for possible violations of these laws and regulations. In addition to these hazardous materials and chemicals, our facility in Sweden also uses Staphylococcus aureus and toxins produced by Staphylococcus aureus in some of its manufacturing processes. Staphylococcus aureus and the toxins it produces, particularly enterotoxins, can cause severe illness in humans. The costs of compliance with environmental and safety laws and regulations are significant. Any violations, even if inadvertent or accidental, of current or future environmental and safety laws or regulations and the cost of compliance with any resulting order or fine could adversely affect our operations.

Climate change, climate change-related regulation and sustainability concerns could adversely affect our businesses and the operations of our subsidiaries, and any actions we take or fail to take in response to such matters could damage our reputation.

Investor advocacy groups, certain institutional investors, investment funds, other market participants and other stakeholders have focused increasingly on the Environmental, Social and Governance ("ESG") practices of companies, including those associated with climate change. These parties have placed increased importance on the importance on the implications of the social cost of their investments. If our ESG practices do not meet investor or other industry stakeholder expectations and standards, which continue to evolve, our reputation and associate retention may be negatively impacted based on an assessment of our ESG practices. Any sustainability disclosures we make may include our policies and practices on a variety of social and ethical matters, including corporate governance, environmental compliance, employee health and safety practices, human capital management, product quality, supply chain management, and workforce inclusion. It is possible that stakeholders may not be satisfied with our ESG practices or the speed of their adoption, or that we may not sufficiently communicate our ESG practices sufficiently to stakeholders. We could also incur additional costs and require additional resources to monitor, report, and comply with various ESG practices. In addition, investors may decide to refrain from investing in us as a result of their assessment of our approach to and consideration of the ESG factors.

In addition, we face physical risks associated with climate change. These physical risks include risks to our manufacturing and supply chain from flooding, severe storms, wildfires, droughts or extreme temperatures, all of which could increase costs and impair our ability to meet customer demands in a timely manner. To date, we have not experienced material losses or disruptions to our operations related to climate change, and we do not anticipate that these risks will have a material impact to our Company in the near term.

Health care reform measures could adversely affect our business.

The efforts of governmental and third-party payors to contain or reduce the costs of health care may adversely affect the business and financial condition of pharmaceutical and biotechnology companies, including ours. Specifically, in both the United States and some foreign jurisdictions, there have been a number of legislative and regulatory proposals to change the health care system in ways that could affect our ability to sell our products profitably. For the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act of 2010 (together, the "ACA"), substantially changed the way health care is financed by both governmental and private insurers. The ACA and other federal and state proposals and health care reforms could limit the prices that can be charged for the products we develop and may limit our commercial opportunity.

In August 2022, the Inflation Reduction Act of 2022 (the "IRA") was signed into law. The IRA includes several provisions that will impact our business to varying degrees, including provisions that create a $2,000 out-of-pocket cap for Medicare Part D beneficiaries, impose new manufacturer financial liability on all drugs in Medicare Part D, allow the U.S. government to negotiate Medicare Part B and Part D pricing for certain high-cost drugs and biologics without generic or biosimilar competition, require companies to pay rebates to Medicare for drug prices that increase faster than inflation, and delay the rebate rule that would require pass through of pharmacy benefit manager rebates to beneficiaries. The implementation of the IRA is currently subject to ongoing litigation challenging the constitutionality of the IRA's Medicare drug price negotiation program. The effect of IRA on our business and the healthcare industry in general is not yet known.

Additionally, the federal government and individual states in the United States have also become increasingly active in passing legislation and implementing regulations designed to control pharmaceutical product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access and marketing cost disclosure and transparency measures, and, in some cases, designed to encourage importation from other countries and bulk purchasing. President Biden has issued multiple executive orders that have sought to reduce prescription drug costs. In February 2023, HHS also issued a proposal in response to an October 2022 executive order from President Biden that includes a proposed prescription drug pricing model that will test whether targeted Medicare payment adjustments will sufficiently incentivize manufacturers to complete confirmatory trials for drugs approved through the U.S. Food and Drug Administration's ("FDA's") accelerated approval pathway. Although a number of these and other proposed measures may require authorization through additional legislation to become effective, and the Biden administration may reverse or otherwise change these measures, both the Biden administration and Congress have indicated that they will continue to seek new legislation measures to control drug costs.

Legally mandated price controls on payment amounts by third-party payors or other restrictions could harm our business, financial condition, results of operations and prospects. In addition, regional healthcare authorities and individual hospitals are increasingly using bidding procedures to determine what pharmaceutical products and which suppliers will be included in their prescription drug and other healthcare programs. This could reduce the ultimate demand for our products or put pressure on drug pricing, which could negatively affect our business, financial condition, results of operations and prospects. We expect that additional state and federal healthcare reform measures will be adopted in the future.

We may be exposed to liabilities under the Foreign Corrupt Practices Act, and any determination that we violated the Foreign Corrupt Practices Act could have a material adverse effect on our business.

We are subject to the FCPA and other laws that prohibit improper payments or offers of payments to foreign governments and their officials and political parties by U.S. persons and issuers as defined by the statute for the purpose of obtaining or retaining business. We have operations and agreements with third parties and make sales in jurisdictions outside of the United States, which may experience corruption. Our activities in jurisdictions outside of the United States create the risk of unauthorized payments or offers of payments by one of our employees, consultants, sales agents or distributors, because these parties are not always subject to our control. These risks have increased following our recent acquisitions of overseas operations and facilities. It is our policy to implement safeguards to discourage these practices by our employees. However, our existing safeguards and any future improvements may prove to be less than effective, and the employees, consultants, sales agents or distributors of Repligen may engage in conduct for which we might be held responsible. Violations of the FCPA may result in severe criminal or civil sanctions, and we may be subject to other liabilities, which could negatively affect our business, operating results and financial condition. In addition, the government may seek to hold us liable for successor liability FCPA violations committed by any companies in which we invest or that we acquire.

Changes in accounting standards and subjective assumptions, estimates, and judgments by management related to complex accounting matters could significantly affect our financial results or financial condition.

Generally accepted accounting principles and related accounting pronouncements, implementation guidelines, and interpretations with regard to a wide range of matters that are relevant to our business, such as revenue recognition, asset impairment and fair value determinations, inventories, business combinations and intangible asset valuations, leases, and litigation, are highly complex and involve many subjective assumptions, estimates, and judgments. Changes in these rules or their interpretation or changes in underlying assumptions, estimates, or judgments could significantly change our reported or expected financial performance or financial condition.

Risks Related to Data and Privacy

Our internal computer systems, or those of our customers, collaborators or other contractors, may be subject to cyber-attacks or security incidents or compromises, which could result in a material disruption of our product development programs.

Despite the implementation of security measures, our internal computer systems and those of our customers, collaborators cloud-based platform service providers, and other contractors are vulnerable to damage from unauthorized access and from cyber-attacks, such as computer viruses, malware, ransomware, phishing denial-of-service attacks, social engineering and other means to affect service reliability and threaten the confidentiality, integrity and availability of information. We have in the past experienced threats and security incidents related to our data and systems, and we may in the future experience other threats, compromises, breaches, or incidents. A material cyber-attack or security incident or compromise could cause interruptions in our operations and could result in a material disruption of our business operations, damage to our reputation or a loss of revenues.

In the ordinary course of our business, we collect and store sensitive data, including, among other things, personally identifiable information about our employees, intellectual property, and proprietary business information. In addition, we could be subject to risks caused by misappropriation, misuse, leakage, falsification or intentional or accidental release or loss of information maintained in the information systems and networks of our company and our vendors, including personal information of our employees, and company and vendor confidential data. Like other companies, we have on occasion experienced, and believe we will continue to experience, data security incidents involving access to company data threats to our data and systems. As previously disclosed, recent cybersecurity incidents and compromises affecting similarly situated companies, including an incident that affected us in 2024, suggest that the risk of such events is significant, even if privacy protection and security measures are implemented and enforced. If a material breach of our information technology systems or those of our vendors occurs, the market perception of the effectiveness of our security measures could be harmed and our reputation and credibility could be damaged.

We could be required to expend significant amounts of money and other resources to respond to these threats or breaches, and to repair or replace information systems or networks and could suffer financial loss or the loss of valuable confidential information. In addition, we could be subject to regulatory actions and/or claims made by individuals and groups in private litigation involving privacy issues related to data collection and use practices and other data privacy laws and regulations, including claims for misuse or inappropriate disclosure of data, as well as unfair or deceptive practices. Moreover, despite our efforts, the possibility of these events occurring cannot be eliminated entirely and there can be no assurance that any measures we take will prevent cyber-attacks or security incidents or compromises that could adversely affect our business.

Changes in laws and regulations governing the privacy and protection of data and personal information could adversely affect our business.

We are subject to data privacy and protection laws and regulations that apply to the collection, transmission, storage and use of proprietary information and personally-identifying information, which among other things, imposes certain requirements relating to the privacy, security and transmission of certain individually identifiable information. In addition, numerous other federal and state laws, including state security breach notification laws, state health information privacy laws and federal and state consumer protection laws, govern the collection, use, disclosure and security of personal information. These laws continue to change and evolve and are increasing in breadth and impact.

For example, with respect to the collection and processing of personal data relating to the European Union (“EU”), European Economic Area (“EEA”) and United kingdom (“UK”), we are subject to the EU General Data Protection Regulation (EU GDPR), the UK General Data Protection Regulation (UK GDPR), as well as applicable data protection laws in effect in the Member States of the EEA and in the UK (including the UK Data Protection Act 2018) which govern the processing of personal data in connection with (a) the offering of goods or services to/the monitoring of the behavior of individuals in the UK and EEA; or (b) the activities of our establishments in the UK and any EEA Member State. The UK’s data protection regime is independent from but aligned to the EU’s data protection regime. In this Form 10-K, “GDPR” refers to both the EU GDPR and the UK GDPR, unless specified otherwise. The GDPR is wide-ranging in scope and imposes numerous requirements on companies that process personal data, including imposing special requirements in respect of the processing of health and other sensitive data, requiring that consent of individuals to whom the personal data relates is obtained in certain circumstances, requiring additional disclosures to individuals regarding data processing activities, requiring that safeguards are implemented to protect the security and confidentiality of personal data, limiting retention periods for personal data, creating mandatory data breach notification requirements in certain circumstances, and requiring that certain measures (including contractual requirements) are put in place when engaging third-party service providers. The GDPR also imposes strict rules on the transfer of personal data to countries outside of the UK and EEA that do not ensure an adequate level of protection, including

the United States in certain circumstances, unless derogation exists or a valid GDPR transfer mechanism (for example, the European Commission approved Standard Contractual Clauses (SCCs) and the UK International Data Transfer Agreement or Addendum (UK IDTA) have been put in place, and transfer impact assessments conducted. Any inability to transfer personal data from the UK or EEA to the United States in compliance with data protection laws may impede our operations and may adversely affect our business and financial position. Following the UK's exit from the EU, or Brexit, there will be increasing scope for divergence in application, interpretation and enforcement of the data protection laws between these territories. For example, the UK has introduced the Data Reform Bill into the UK legislative process with the intention for this bill to reform the UK's data protection regime following Brexit. If passed, the final version of the Data Reform Bill may have the effect of further altering the similarities between the UK and EEA data protection regimes and threaten the UK adequacy decision from the EU Commission allowing the free flow of personal data from the UK to the EEA, which may lead to additional compliance costs and could increase our overall risk. This lack of clarity on future UK laws and regulations and their interaction with those of the EEA could add legal risk, uncertainty, complexity, and cost to our handling of European personal data and our privacy and security compliance programs, and could require us to implement different compliance measures for the UK and EEA. Failure to comply with the requirements of the GDPR and the related national data protection laws of the EEA Member States and the UK may result in fines up to €20 million (17.5 million for the UK GDPR) or 4% of a company's global annual revenues for the preceding financial year, whichever is higher. The GDPR also confers a private right of action on data subjects and consumer associations to lodge complaints with supervisory authorities, seek judicial remedies, and obtain compensation for damages resulting from violations of the GDPR. Complying with these European data protection laws may impose significant costs or otherwise require us to divert resources or implement changes to our business processes, and any actual or perceived non-compliance could result in significant penalties, claims and reputational damage.

Additionally, we face risks from evolving and uncertain privacy standards in our industry. For example, the California Consumer Privacy Act ("CCPA") is a comprehensive privacy law that creates individual privacy rights and increased privacy and security obligations on businesses handling the personal data of California residents. The CCPA requires covered businesses to provide certain disclosures to consumers about data collection, use and sharing practices, to allow California residents to opt out of certain sales and disclosures of personal information, and to opt out of certain uses of sensitive personal information, including health information. The law also created a new regulatory agency in California and that agency's finalized and proposed regulations are continuing to change the standard of privacy protection we are required to meet. Numerous other states have passed similar consumer privacy laws that are or will be implemented and enforced by various state regulators. Like the CCPA, these laws grant consumers rights in relation to their personal information and impose new obligations on regulated businesses, including, in some instances, broader data security requirements.

In addition, federal and state legislators and regulators are imposing new and heightened protections for health and other sensitive information that could impact our business. For example, the Federal Trade Commission ("FTC") has imposed stringent requirements on the collection and disclosure of sensitive categories of personal information, including health information, and has expanded the application of its Health Breach Notification Rule. Through executive and legislative action, the federal government has also taken steps to restrict data transactions involving certain sensitive data categories – including health data, genetic data, and biospecimens – with persons affiliated with China, Russia, and other countries of concern. Washington's My Health My Data Act, which went into effect in March 2024, requires regulated entities to obtain consent to collect health information, grants consumers certain rights, including to request deletion, and provides for robust enforcement mechanisms, including enforcement by the state attorney-general and by litigants through a private right of action for consumer claims. These current and future data privacy laws and regulations may require us to modify our data collection or processing practices and policies, incur substantial costs and expenses in an effort to comply and increase our potential exposure to regulatory enforcement, reputational damage, and/or litigation.

Also, our customers may be subject to different privacy laws, rules and legislation, which may mean that they require us to be bound by varying contractual requirements applicable to certain other jurisdictions. Adherence to such contractual requirements may impact our collection, use, processing, storage, sharing and disclosure of information. As we expand our customer base, these requirements may vary from customer to customer, further increasing the cost of compliance and doing business.

The use of new and evolving technologies, such as artificial intelligence ("AI"), in our offerings may present risks and challenges that can impact our business including by posing security risks to our confidential information, proprietary information, and personal data.
We may build and integrate AI into our business practices, and the evolving nature of AI technologies and the surrounding legal and regulatory environment presents risks and uncertainties that could affect our business. The use of AI technology can give rise to intellectual property risks, including compromises to proprietary intellectual property and intellectual property infringement. Additionally, we expect to see increasing government regulation related to artificial intelligence use and ethics, which may also significantly increase the burden and cost of research, development and compliance in this area. For example, in the U.S., a number of states have proposed and passed laws regulating various uses of AI, and federal regulators have issued guidance affecting the use of AI in regulated sectors. In Europe, the EU's Artificial Intelligence Act ("AI Act") — which entered into force on August 1, 2024 and, with some exceptions, will begin to apply as of August 2, 2026 — imposes significant obligations on providers and deployers of high-risk artificial intelligence systems, and encourages providers and deployers of artificial intelligence systems to account for EU ethical principles in their development and use of these systems. If we develop or deploy AI systems that are governed by these laws and regulations, we may be required to adopt higher standards of data quality, transparency, and human oversight, and adhere to specific and potentially burdensome and costly ethical, accountability, and administrative requirements. Even in the absence of dedicate AI laws and regulations, we may be subject to novel legal and business risks relating to our adoption of these new technologies. Our vendors may in turn incorporate AI tools into their own offerings, and the providers of these AI tools may not meet existing or rapidly evolving regulatory or industry standards, including with respect to privacy and data security. Further, bad actors around the world use increasingly sophisticated methods, including the use of AI, to engage in illegal activities involving the theft and misuse of personal information, confidential information, and intellectual property. Any of these outcomes could damage our reputation, result in the loss of valuable property and information, and adversely impact our business.

Risks Related to Our Products and Technology

Risks Related to Our Intellectual Property

If we are unable to obtain or maintain our intellectual property, we may not be able to succeed commercially.

We endeavor to obtain and maintain trade secrets and pursue strategic patent protection in order to protect our products and processes from unauthorized use, and to produce a financial return consistent with the significant time and expense required to bring our products to market and continue to be competitive in our technical fields. Our success depends, in part, on our ability to:

- preserve our trade secrets, know-how and confidential information;
- operate without infringing the proprietary rights of third parties;
- obtain and maintain patent protection for our products and processes; and
- secure any necessary licenses from others on acceptable terms.

We consider trade secrets, know-how and other forms of market protection to be among the most important elements of our proprietary position, in particular, as it relates to many of the products that currently account for a majority of our revenue. We also own or have exclusive rights to U.S. patents and U.S. pending patent applications as well as corresponding foreign patents and patent applications. We continue to actively and selectively pursue patent protection and seek to expand our patent estate, particularly for our products currently in development, and we cannot be sure that any patent applications that we will file in the future or that any currently pending applications will issue on a timely basis, if ever. We cannot be certain that we were the first to conceive the invention(s) described by each of our pending patent applications or that we were the first to file patent applications for such invention(s). Even if patents are issued, the degree of protection afforded by such patents will depend upon the:

- scope of the patent claims;
- validity and enforceability of the claims obtained in such patents; and
- our willingness and financial ability to enforce and/or defend them.

Patents that may be granted to us in certain foreign countries may be subject to opposition proceedings brought by third parties or result in suits by us, which may be costly and result in adverse consequences for us.

In some cases, litigation or other proceedings may be necessary to assert claims of infringement, to enforce patents issued to us or our licensors, to protect trade secrets, know-how or other intellectual property rights we own or to determine the scope and validity of the proprietary rights of third parties. Such litigation could result in substantial costs to us and diversion of our resources. An adverse outcome in any such litigation or proceeding could have a material adverse effect on our business, financial condition and results of operations. If our competitors prepare and file patent applications that claim technology also claimed by us, we may be required to participate in interference proceedings declared by Patent Offices to determine priority of invention, which would result in substantial costs to us.

While we continue to obtain patent grants directed towards Protein A, other patent grants directed towards Protein A have expired, and as a result, we may face increased competition, which could harm our results of operations, financial condition, cash flow and future prospects.

Other companies could begin manufacturing and selling native or some of the commercial forms of recombinant Protein A in the United States and may directly compete with us on certain Protein A products. This may induce us to sell Protein A at lower prices and may erode our market share, which could adversely affect our results of operations, financial condition, cash flow and future prospects.

Our freedom to develop our products may be challenged by others, and we may have to engage in litigation to determine the scope and validity of competitors' patents and proprietary rights, which, if we do not prevail, could harm our business, results of operations, financial condition, cash flow and future prospects.

There has been substantial litigation and other proceedings regarding the complex patent and other intellectual property rights in the life sciences industry. We have been a party to, and in the future may become a party to, patent litigation or other proceedings regarding intellectual property rights.

We may become involved in patent litigation or other intellectual property proceedings, including the following situations:

- We may initiate litigation or other proceedings against third parties to seek to invalidate the patents held by such third parties or to obtain a judgment that our products or services do not infringe on such third parties' patents.
- We may initiate litigation or other proceedings against third parties to seek to enforce our patents against infringers.
- If our competitors file patent applications that claim technology also claimed by us, we may participate in interference or opposition proceedings to determine the priority of invention.
- If third parties initiate litigation claiming that our processes or products infringe their patent or other intellectual property rights, we will need to defend against such claims.

The cost to us of any patent litigation or other proceeding, even if resolved in our favor, could be substantial. Some of our competitors may be able to sustain the cost of such litigation or proceedings more effectively than we can because of their substantially greater financial resources. If a patent litigation or other intellectual property proceeding is resolved in a way that is unfavorable to us, we or our collaborative or strategic partners may be enjoined from manufacturing or selling our products and services without a license from the other party and be held liable for significant damages. The failure to obtain any required license on commercially acceptable terms or at all may harm our business, results of operations, financial condition, cash flow and future prospects.
Uncertainties resulting from the initiation and continuation of patent litigation or other proceedings could have a material adverse effect on our ability to compete in the marketplace. Patent litigation and other proceedings may also absorb significant management time, attention and resources.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

ITEM 1C. CYBERSECURITY

Governance Related to Cybersecurity Risks

Our Board of Directors ("Board") holds overall oversight responsibility for the Company's strategy and risk management, including in relation to cybersecurity risks. Our Board exercises its oversight function through the Audit Committee, which oversees the management of risk exposure across various areas, including data security risks, in accordance with its charter. The Audit Committee receives quarterly reports from our Chief

Information Officer ("CIO") on the status of the Company's cybersecurity program, including measures implemented to monitor and address cybersecurity risks and threats, as appropriate.

Our enterprise risk management committee ("ERMC") is composed of senior management, including the CIO and other senior executives. The ERMC monitors and oversees risk areas that potentially could pose a high impact to the business, and cybersecurity currently is one of the ERMC's priority focus areas. The ERMC reports on our top identified risks and steps to address those risks to the full Board on a semi-annual basis. Our CIO has over twenty years of information technology experience.

Our IT Infrastructure & Security Operations teams manage the day-to-day administration of our cybersecurity program. We also work with a managed security service provider to monitor for vulnerabilities and threats. The service provider has the authority to take actions to remediate critical and high vulnerabilities, and these are reported to the IT Infrastructure & Security Operations team and up to the CIO and other members of senior management, where appropriate. We engage employees in our cybersecurity efforts through a quarterly process for employees to complete mandatory security and awareness training as well as monthly simulated phishing campaigns. We also conduct specific training and tabletop exercises for key personnel involved in cybersecurity risk management.

Cybersecurity Risk Management and Strategy

We maintain a cybersecurity program, which is informed by industry standards, that includes processes for identification, assessment, and management of cybersecurity risks and which is integrated into our larger enterprise-wide risk management program . We conduct periodic risk assessments, including with support from external vendors, to assess our cyber program, identify areas of enhancement, and develop strategies for the mitigation of cyber risks. We also conduct regular security penetration testing and have established a vulnerability management process supported by security testing, for the treatment of identified security risks based on severity. Third-parties that access, process, collect, share, create, store, transmit or destroy our information or have access to our systems may have additional contractual controls.

Our IT Infrastructure & Security Operations team is informed about and monitors the prevention, detection, mitigation, and remediation of cybersecurity risks through various means, including by leveraging managed security service providers and other third-party security software and technology services. In addition, we institute processes and technologies for the monitoring of security alerts from internal parties and external resources, including from information security research sources. We also have implemented processes and technologies for network monitoring and data loss prevention procedures.

We have been subject to cybersecurity incidents in the past, including the publicly disclosed July 2024 security incident. Although we do not believe that risks from cybersecurity threats, including as a result of any previous cybersecurity incidents have materially affected us, our business strategy, results of operations or financial condition, there is no guarantee that past security incidents and any future incidents will not have a material impact on our business strategy, results of operations, or financial condition in the future. See Item 1A, "Risk Factors," to this report for more information.

ITEM 2. PROPERTIES

Our material office, manufacturing and warehouse leases are detailed below:

Location	Square Feet		Principal Use	Lease Expiration
Waltham, Massachusetts	182,243		Corporate headquarters, manufacturing, research and development, marketing and administrative offices	October 31, 2030
Rancho Dominguez, California	140,983	(1)	Manufacturing, research and development, marketing and administrative operations	July 15, 2035
Shrewsbury, Massachusetts	139,000	(2)	Warehouse	January 31, 2034
Marlborough, Massachusetts	130,700		Manufacturing operations	November 30, 2033
Jüri, Estonia	76,000	(3)	Office, manufacturing and storage space	March 13, 2024
Toulouse, France	67,285		Manufacturing and administrative operations	March 31, 2032
Lund, Sweden	65,240		Manufacturing and administrative operations	December 31, 2026
Hopkinton, Massachusetts	64,000		Manufacturing, assembly site	July 13, 2034
Bridgewater, New Jersey	57,739		Manufacturing and administrative operations	February 1, 2034
Compton, California	54,060		Warehouse	May 31, 2029
Waterford, Ireland	50,311		Manufacturing, administrative operations and assembly site	January 31, 2037
Clifton Park, New York	34,386		Manufacturing operations	November 30, 2029
Lebanon, New Hampshire	31,313		Research and development and administrative operations	July 31, 2026

(1) On December 1, 2024, we expanded our Rancho Dominguez facilities, adding an additional 72,000 square feet.

(2) On February 1, 2024, we leased approximately 139,000 square feet of primarily warehouse space in Shrewsbury, Massachusetts.

(3) On January 1, 2024, we leased approximately 76,000 square feet of office, manufacturing and storage space in Jüri, Estonia.

During the year ended December 31, 2024, we incurred total rental costs for all facilities of $28.8 million.

ITEM 3. LEGAL PROCEEDINGS

From time to time, we may be subject to legal proceedings and claims in the ordinary course of business. We are not currently aware of any such proceedings or claims that we believe will have, individually or in the aggregate, a material adverse effect on our business, financial condition or results of operations.

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 is traded on the Nasdaq Global Select Market under the symbol "RGEN."

Stockholders and Dividends

As of March 11, 2025, there were 222 stockholders of record of our common stock. We have not paid any dividends since our inception and do not intend to pay any dividends on our common stock in the foreseeable future. We anticipate that we will retain all earnings, if any, to support our operations. Any future determination as to the payment of dividends will be at the sole discretion of our Board of Directors ("Board") and will depend on our financial condition, results of operations, capital requirements and other factors the Board deems relevant.

Equity Compensation Plan Information

The following table sets forth information as of December 31, 2024, regarding shares of common stock that may be issued under the Company's equity compensation plans, consisting of the Amended and Restated 2012 Stock Option and Incentive Plan and the 2018 Stock Option and Incentive Plan.

Plan Category	Number of securities to be issued upon exercise of outstanding options, warrants and rights	Weighted-average exercise price of outstanding options, warrants and rights	Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in column (a))
	(a)	(b)	(c)
Equity compensation plans approved by security holders	1,131,790[1]	$ 98.64[2]	1,479,932

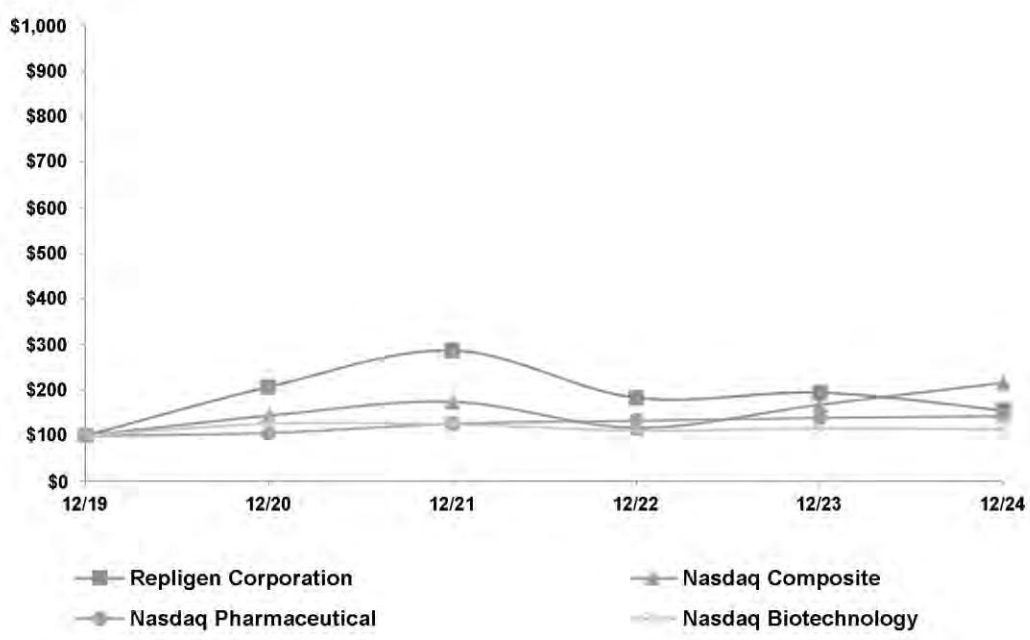
(1) Includes 661,178 shares of common stock issuable upon the exercise of outstanding options and 470,612 shares of common stock issuable upon the vesting of stock units, which include restricted stock units and performance stock units. No shares of restricted stock are outstanding.

(2) Since stock units do not have any exercise price, such units are not included in the weighted average exercise price calculation.

Stock Performance Graph

The graph below matches Repligen Corporation's cumulative 5-year total shareholder return on common stock with the cumulative total returns of the Nasdaq Composite index, the Nasdaq Pharmaceutical index, and the Nasdaq Biotechnology index. The graph tracks the performance of a $100 investment in our common stock and in each index (with the reinvestment of all dividends) from December 31, 2019 to December 31, 2024. The comparisons shown in the graph below are based upon historical data. We caution that the stock price performance shown in the graph below is not necessarily indicative of, nor is it intended to forecast, the potential future performance of our common stock.

COMPARISON OF 5 YEAR CUMULATIVE TOTAL RETURN*
Among Repligen Corporation, the Nasdaq Composite Index,
the Nasdaq Pharmaceutical Index and the Nasdaq Biotechnology Index



*$100 invested on December 31, 2019 in stock or index, including reinvestment of dividends. Fiscal year ending December 31.

The information contained in the performance graph shall not be deemed to be "soliciting material" or to be "filed" with the Securities and Exchange Commission, and such information shall not be incorporated by reference into any future filing under the Securities Act of 1933, as amended (the "Securities Act") or the Securities Exchange Act of 1934, as amended (the "Exchange Act"), except to the extent that Repligen specifically incorporates it by reference into such filing.

Issuer Purchases of Equity Securities

In June 2008, the Board authorized a program to repurchase up to 1.25 million shares of our common stock to be repurchased at the discretion of management from time to time in the open market or through privately negotiated transactions (the "2008 Share Repurchase Program"). The 2008 Repurchase Program has no set expiration date and may be suspended or discontinued at any time. We did not repurchase any shares of common stock under the 2008 Repurchase Program during the year ended December 31, 2024. In prior years, we repurchased a total of 592,827 shares, leaving 657,173 shares remaining under this authorization.

In December 2023, the Board authorized and approved a stock repurchase, separate from the 2008 Share Repurchase Program, of up to $25.0 million of our common stock concurrent with the issuance of $600.0 million aggregate principal amount of 1.00% Convertible Senior Notes due 2028 ("2023 Notes"). See Note 15, "*Convertible Senior Notes,*" included in this report for more information on the issuance. We used $14.4 million of the proceeds from the issuance of the 2023 Notes to repurchase 92,090 shares at a price of $156.22, including transaction costs, to offset the impact of dilution from the issuance of 2023 Notes and equity compensation programs as well as to reduce our outstanding share count ("2023 Share Repurchase Program"). We have elected to retire the shares repurchased to date under the 2023 Share Repurchase Program. Retired shares become part of the pool of authorized but unissued shares. The purchase price of the retired shares in excess of par value, including transaction costs, is recorded as a decrease to additional paid-in capital in our consolidated balance sheets as of December 31, 2023.

ITEM 6. [RESERVED]

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

Information pertaining to fiscal years 2023 and 2022 was included in the Company's Annual Report on Form 10-K/A ("Form 10-K/A") for the year ended December 31, 2023, on pages 36 through 50 under Part II, Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations," which was filed with the Securities and Exchange Commission on November 18, 2024 and Form 10-K for the year ended December 31, 2022, on pages 37 through 53 under Part II, Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations," which was filed with the Securities and Exchange Commission on February 22, 2023, respectively.

Repligen and its subsidiaries, collectively doing business as Repligen Corporation ("Repligen", "we", "our", or "the Company") is a global life sciences company that develops and commercializes highly innovated bioprocessing technology and systems that increase efficiencies and flexibility in the process of manufacturing biological drugs.

As the overall market for biologics continues to grow and expand, our customers – primarily large biopharmaceutical companies and contract development and manufacturing organizations and other life sciences companies (integrators) – face critical production cost, capacity, quality and time pressures. Built to address these concerns, our products help set new standards for the way biologics are manufactured. We are committed to inspiring advances in bioprocessing as a trusted partner in the production of critical biologic drugs – including monoclonal antibodies ("mAbs"), recombinant proteins, vaccines and cell and gene therapies ("C&GT") – that are improving human health worldwide. Increasingly, our technologies are being implemented to overcome challenges in processing plasmid DNA (a starting material for the production of mRNA) and gene delivery vectors such as lentivirus and adeno-associated viral vectors. For more information regarding our business, products and acquisitions, see above sections in Part I, Item 1. *"Business"* including "Overview", "Our Products", "2024 Acquisitions", "2023 Acquisitions" and "Our Market Opportunity" sections therein.

Macroeconomic Trends

As a result of our global presence, a significant portion of our revenue and expenses is denominated in currencies other than the U.S. dollar. We are therefore subject to non-U.S. exchange exposure. Exchange rates can be volatile and a substantial weakening or strengthening of foreign currencies against the U.S. dollar could increase or reduce our revenue and gross profit margin and impact the comparability of results from period to period.

We have experienced, and expect to continue to experience, cost inflation, primarily in raw materials, and other supply chain costs, as a result of global macroeconomic trends, including global geopolitical conflicts and labor shortages. Actions taken to mitigate supply chain disruptions and inflation, including price increases and productivity improvements, have generally been successful in offsetting the impact of these trends. In addition, decreasing demand for vaccines for the COVID-19 pandemic, including all subsequent variants of the SARS-CoV-1 coronavirus ("COVID-19") is driving a reduction in future demand of our products related to these vaccines. We expect that these trends will continue to impact our results for 2025 as well.

Critical Accounting Policies and Estimates

While our significant accounting policies are more fully described in the notes to our consolidated financial statements, we have identified the policies and estimates below as being critical to our business operations and the understanding of our results of operations. These policies require management's most difficult, subjective or complex judgments, often as a result of the need to make estimates about the effect of matters that are inherently uncertain. The impact of and any associated risks related to these policies on our business operations are discussed throughout "Management's Discussion and Analysis of Financial Condition and Results of Operations," specifically in the "Results of Operations" section, where such policies affect our reported and expected financial results. Although we believe that our estimates, assumptions, and judgments are reasonable, they are based upon information presently available. Actual results may differ significantly from these estimates under different assumptions, judgments, or conditions.

Revenue recognition

We generate revenue from the sale of bioprocessing products, equipment devices, and related consumables used with these equipment devices to customers in the life science and biopharmaceutical industries. Under Accounting Standards Codification ("ASC") Topic 606, "Revenue from Contracts with Customers," revenue is recognized when, or as, obligations under the terms of a contract are satisfied, which occurs when control of the promised products or services is transferred to customers. Revenue is measured as the amount of consideration we expect to receive in exchange for transferring products or services to a customer ("transaction price"). To the extent the transaction price includes variable consideration, we estimate the amount of variable consideration that should be included in the transaction price utilizing the

expected value method or the most likely amount method, depending on the facts and circumstances relative to the contract. Variable consideration is included in the transaction price if, in our judgment, it is probable that a significant future reversal of cumulative revenue under the contract will not occur. Estimates of variable consideration and the determination of whether to include estimated amounts in the transaction price are based largely on an assessment of our anticipated performance and all information (historical, current and forecasted) that is reasonably available. Sales, value add, and other taxes collected on behalf of third parties are excluded from revenue.

When determining the transaction price of a contract, an adjustment is made if payment from a customer occurs either significantly before or significantly after performance, resulting in a significant financing component. We do not assess whether a significant financing component exists if the period between when we perform our obligations under the contract and when the customer pays is one year or less. None of our contracts contained a significant financing component as of December 31, 2024.

Contracts with customers may contain multiple performance obligations. For such arrangements, the transaction price is allocated to each performance obligation based on the estimated relative standalone selling prices of the promised products or services underlying each performance obligation. We determine standalone selling prices based on the price at which the performance obligation is sold separately. If the standalone selling price is not observable through past transactions, we estimate the standalone selling price taking into account available information such as market conditions and internally approved pricing guidelines related to the performance obligations.

We recognize product revenue under the terms of each customer agreement upon transfer of control to the customer, which occurs at a point in time.

Shipping and handling fees are recorded as a component of product revenue, with the associated costs recorded as a component of cost of goods sold in our consolidated statements of comprehensive income.

Inventories

We value inventory at cost or, if lower, net realizable value, using the first-in, first-out method. We review our inventory at least quarterly and record a provision for excess and obsolete inventory based on our estimates of expected sales volume, production capacity and expiration dates of raw materials, work-in-process and finished products. We write down inventory that has become obsolete, inventory that has a cost basis in excess of its expected net realizable value, and inventory in excess of expected requirements to cost of goods sold in our consolidated statements of comprehensive income. Manufacturing of bioprocessing finished goods is done to order and tested for quality specifications prior to shipment.

A change in the estimated timing or amount of demand for our products could result in additional provisions for excess inventory quantities on hand. Any significant unanticipated changes in demand or unexpected quality failures could have a significant impact on the value of inventory and reported operating results. In 2024, we recorded $36.0 million in inventory adjustments, which includes the impact of the Company discontinuing the sale of certain product SKUs and the impact of having proactively secured materials during the pandemic to meet accelerated demand during a challenging supply chain environment in the industry. Where demand has reduced, finished goods and raw materials, whose value exceeded the projected requirements to be used before reaching their expiration date, or in a reasonable time horizon, were written down to their realizable value. The Restructuring Plan described in Note 7, "*Restructuring Activities and Other Inventory-Related Charges*," to our consolidated financial statements, also includes the closing of manufacturing facilities and excess production lines, which included inventory that could not be repurposed.

Business combinations

Total consideration transferred for acquisitions is allocated to the tangible and intangible assets acquired and liabilities assumed, if any, based on their fair values at the dates of acquisition. This purchase price allocation process requires management to make significant estimates and assumptions with respect to intangible assets and deferred revenue obligations. The fair value of identifiable intangible assets is based on detailed valuations that use information and assumptions determined by management. Any excess of purchase price over the fair value of the net tangible and intangible assets acquired is allocated to goodwill. While we use our best estimates and assumptions to accurately value assets acquired and liabilities assumed at the acquisition date as well as any contingent consideration, where applicable, our estimates are inherently uncertain and subject to refinement. As a result, during the measurement period, which may be up to one year from the acquisition date, we record adjustments to the assets acquired and liabilities assumed with the corresponding offset to goodwill. Upon conclusion of the measurement period or final determination of the values of assets acquired or liabilities assumed, whichever comes first, any subsequent adjustments are recorded to our consolidated statements of comprehensive income. The Company estimates the fair value of the contingent

consideration earnouts using a Monte Carlo Simulation and updates the fair value of the contingent consideration at each reporting period based on the estimated probability of achieving the earnout targets and applying a discount rate that captures the risk associated with the expected contingent payments. To the extent that our estimates change in the future regarding the likelihood of achieving these targets, we may need to record material adjustments to our accrued contingent consideration. Such changes in the fair value of contingent consideration are recorded as contingent consideration in our consolidated statements of comprehensive income. The fair value of contingent consideration obligations for the year ended December 31, 2024 had a net change of $3.2 million primarily related to the change in the contingent consideration obligations from the acquisition of Avitide, Inc. (“Avitide”) in September 2021.

We use the income approach to determine the fair value of certain identifiable intangible assets including customer relationships and developed technology. This approach determines fair value by estimating after-tax cash flows attributable to these assets over their respective useful lives and then discounting these after-tax cash flows back to a present value. We base our assumptions on estimates of future cash flows, expected growth rates, expected trends in technology, etc. We base the discount rates used to arrive at a present value as of the date of acquisition on the time value of money and certain industry-specific risk factors. We believe the estimated purchased customer relationships, developed technologies, trademark/tradename, patents, non-competition agreements and in-process research and development ("R&D") amounts so determined represent the fair value at the date of acquisition and do not exceed the amount a third-party would pay for the assets.

Intangible assets and goodwill

Intangible assets

Intangible assets with a definite life are amortized over their useful lives using the straight-line method and the amortization expense is recorded within cost of goods sold, research and development, and selling, general and administrative expense in the consolidated statements of comprehensive income. Intangible assets and their related useful lives are reviewed at least annually to determine if any adverse conditions exist, that would indicate the carrying value of these assets may not be recoverable. More frequent impairment assessments are conducted if certain conditions exist, including a change in the competitive landscape, any internal decisions to pursue new or different technology strategies, a loss of a significant customer, or a significant change in the marketplace, including changes in the prices paid for the Company’s products or changes in the size of the market for the Company’s products. If impairment indicators are present, the Company determines whether the underlying intangible asset is recoverable through estimated future undiscounted cash flows. If the asset is not found to be recoverable, it is written down to the estimated fair value of the asset based on the sum of the future discounted cash flows expected to result from the use and disposition of the asset. If the estimate of an intangible asset’s remaining useful life is changed, the remaining carrying amount of the intangible asset is amortized prospectively over the revised remaining useful life. The Company continues to believe that its definite-lived intangible assets are recoverable at December 31, 2024.

Indefinite-lived intangible assets are tested for impairment at least annually. There has been no impairment of our intangible assets for the periods presented.

Goodwill

We test goodwill for impairment on an annual basis and between annual tests if events and circumstances indicate it is more likely than not that the fair value of a reporting unit is less than its carrying value. Events that would indicate impairment and trigger an interim impairment assessment include, but are not limited to, macroeconomic conditions, industry and market conditions, entity specific factors such as strategies and financial performance, a significant adverse change in legal factors and an adverse action or assessment by a regulator. Goodwill is tested for impairment as of October 1 of each year, or more frequently as warranted by events or changes in circumstances mentioned above. Accounting guidance also permits an optional qualitative assessment for goodwill to determine whether it is more likely than not that the carrying value of a reporting unit exceeds its fair value. If, after this qualitative assessment, we determine that it is not more likely than not that the fair value of a reporting unit is less than its carrying amount, then no further quantitative testing would be necessary. A quantitative assessment is performed if the qualitative assessment results in a more likely than not determination or if a qualitative assessment is not performed. The quantitative assessment considers whether the carrying amount of a reporting unit exceeds its fair value, in which case an impairment charge is recorded to the extent the reporting unit’s carrying value exceeds its fair value.

We operate as one reporting unit. We performed a qualitative assessment for our reporting unit as of October 1, 2024, December 31, 2023 and December 31, 2022. Based on the assessment, we concluded that it was more likely than not that the estimated fair value of our reporting unit for 2024, 2023 and 2022 was higher than its carrying value for such years, and that the performance of the quantitative impairment test was not required. Therefore, no impairment was required for any of the periods presented.

Prior to fiscal year 2024, testing of impairment on our goodwill occurred annually as of our measurement date of December 31st, pursuant to Company policy. Subsequent to the 2023 annual impairment test, which was completed on December 31, 2023, we voluntarily changed our annual impairment assessment date from December 31st to October 1st, the first day of our fourth quarter, beginning on October 1, 2024. The change is being made to better align the annual impairment assessment date with our annual planning and budgeting process as well as the long-term planning and forecasting process. We have determined that this voluntary change in accounting principle is preferable and will not impact our consolidated financial statements nor is it being done to accelerate, avoid or trigger an impairment charge. This change is not going to be applied retrospectively as it is impracticable to do so because retrospective application would require application of significant estimates and assumptions with the use of hindsight. Therefore, the change will be applied prospectively.

Debt accounting

In December 2023, we issued $600.0 million aggregate principal amount of 1.00% Convertible Senior Notes due 2028 ("2023 Notes") in a private placement pursuant to separate, privately negotiated exchange and subscription agreements (the "Exchange and Subscription Agreements") with a limited number of holders of our outstanding 0.375% Convertible Senior Notes due 2024 ("2019 Notes") and certain other qualified institutional buyers pursuant to Rule 144A under the Securities Act of 1933, as amended. Pursuant to the Exchange and Subscription Agreements, we exchanged $217.7 million of our 2019 Notes for $309.9 million aggregate principal amount of the 2023 Notes (the "Exchange Transaction") and issued $290.1 million aggregate principal amount of the 2023 Notes in a private placement to accredited institutional buyers (the "Subscription Transactions") for cash. Immediately following the closing of the aforementioned transactions, $69.7 million in aggregate principal amount of the 2019 Notes remained outstanding.

We evaluated the Exchange Transaction and determined approximately $29.6 million of the $217.7 million principal of the exchanged 2019 Notes were accounted for as extinguishments of debt and approximately $188.1 million were accounted for as modification of debt. As a result, we recognized a $12.7 million loss on extinguishment of debt in our consolidated statements of comprehensive income for the year ended December 31, 2023. This included unamortized debt issuance costs related to the extinguished 2019 Notes. Under modification accounting, the carrying amount of the modified 2019 Notes was reduced by $2.8 million, with the offset going to additional paid-in capital, to account for the increase in fair value of the embedded conversion option in the modification. The increase in principal, along with the increased option value, totaling $82.1 million, is reflected as a debt discount and is a direct reduction from the carrying value of the debt on our consolidated balance sheets. This amount will be accreted as an adjustment to interest expense using the effective interest method and will accrete up to the full face value of the 2023 Notes of $600.0 million.

Proceeds from the Subscription Transactions amounted to $276.1 million after debt issuance costs of $14.0 million. The exchange resulted in $6.2 million of the debt issuance costs related to the modified notes to be recorded to amortization of debt issuance costs in our 2023 consolidated statement of comprehensive income under the rules of modification accounting. The remaining debt issuance costs of $7.8 million as well as $0.7 million of unamortized costs carried over from the 2019 Notes at the exchange date, were capitalized within long-term debt (as a contra-liability) in our consolidated balance sheets and will be amortized as an adjustment to amortization of debt issuance costs over the five-year term of the 2023 Notes in our consolidated statement of comprehensive income. The carrying value of the 2023 Notes of $525.6 million is included in long-term debt on our consolidated balance sheets as of December 31, 2024.

Prior to the close of business on the business day immediately preceding September 15, 2028, the 2023 Notes will be convertible at the option of the holders of 2023 Notes only upon the satisfaction of specified conditions and during certain periods into cash up to their principal amount, and into cash, shares of the Company's common stock or a combination of cash and the Company's common stock, at the Company's election, for the conversion value above the principal amount, if any. Thereafter until the close of business on the second scheduled trading day immediately preceding the maturity date, the 2023 Notes will be convertible at the options of the holders of 2023 Notes at any time regardless of these conditions. The Company may redeem for cash, all or a portion of the 2023 Notes, at its option, on or after December 18, 2026 and prior to the 21st scheduled trading day immediately preceding the maturity date at a redemption price of 100% of the principal amount of the 2023

Notes to be redeemed, plus accrued and unpaid interest to, but excluding the redemption date, if certain conditions are met in accordance to the indenture.

During the fourth quarter of 2023, the closing price of the Company's common stock exceeded 130% of the conversion price of the 2019 Notes for more than 20 trading days of the last 30 consecutive trading days of the quarter. As a result, the remaining $69.7 million aggregate principal amount of 2019 Notes were convertible at the option of the holders of the 2019 Notes during the first quarter of 2024. During 2024, $0.2 million aggregate principal amount of the 2019 Notes converted, bringing the remaining outstanding 2019 Notes to $69.5 million in aggregate principal amount. The remaining 2019 Notes matured and were paid off in full on July 15, 2024. The Company irrevocably elected to settle the conversion of the 2019 Notes using a combination of cash and the Company's common stock, settling the par value of the 2019 Notes in cash and any excess conversion premium in shares. In connection with the conversion, the Company paid $69.6 million in cash, which included principal and accrued interest, and issued 100,944 shares of the Company's common stock representing the conversion premium.

Stock-based compensation

We use the Black-Scholes option pricing model to calculate the fair value of stock option awards on the grant date. The expected term of options granted represents the period of time for which the options are expected to be outstanding and is derived from our historical stock option exercise experience and option expiration data. For purposes of estimating the expected term, we have aggregated all individual option awards into one group, as we do not expect substantial differences in exercise behavior among our employees. The expected volatility is a measure of the amount by which our stock price is expected to fluctuate during the expected term of options granted. We determined the expected volatility based upon the historical volatility of our common stock over a period commensurate with the option's expected term. The risk-free interest rate is the implied yield available on U.S. treasury zero-coupon issues with a remaining term equal to the option's expected term on the grant date. We have never declared or paid any cash dividends on any of our capital stock and do not expect to do so in the foreseeable future. Accordingly, we use an expected dividend yield of zero to calculate the grant-date fair value of a stock option.

The fair value for stock units, which include restricted stock units and performance stock units, is calculated using the closing price of the Company's common stock on the date of grant. We recognize compensation expense on awards that vest based on service conditions on a straight-line basis over the requisite service period based upon the number of options that are ultimately expected to vest, and accordingly, such compensation expense has been adjusted by an amount of estimated forfeitures. We recognize compensation expense on awards that vest based on performance conditions following our assessment of the probability that the performance condition will be achieved over the service period. Forfeitures represent only the unvested portion of surrendered options, restricted stock units and performance stock units. Forfeitures are estimated at the time of grant and revised, if necessary, in subsequent periods if actual forfeitures differ from those estimates. Based on an analysis of historical data, we have calculated an 8% annual forfeiture rate for non-executive level employees, a 3% annual forfeiture rate for executive level employees, and a 0% forfeiture rate for non-employee members of the Board of Directors ("Board"), which we believe are reasonable assumptions to estimate forfeitures. However, the estimation of forfeitures requires significant judgment and, to the extent actual results or updated estimates differ from our current estimates, a cumulative adjustment to stock-based compensation expense will be recorded in the period estimates are revised.

For the years ended December 31, 2024, 2023 and 2022, we recorded stock-based compensation expense of $48.1 million, $25.6 million and $27.3 million, respectively, for share-based awards granted under all of the Company's stock plans.

As of December 31, 2024, there was $56.5 million of total unrecognized compensation cost related to unvested share-based awards. This cost is expected to be recognized over a weighted average remaining requisite service period of 2.7 years. We expect 2,305,232 unvested options and stock units to vest over the next five years.

Income taxes

Deferred taxes are determined based on the difference between the consolidated financial statements and tax basis of assets and liabilities using enacted tax rates in effect in the years in which the differences are expected to reverse. Valuation allowances are provided, if, based upon the weight of available evidence, it is more likely than not that some or all of the deferred tax assets will not be realized. We account for uncertain tax positions using a "more-likely-than-not" threshold for recognizing and resolving uncertain tax positions. The evaluation of uncertain tax positions is based on factors including, but not limited to, changes in tax law, the measurement of tax positions taken or expected to be taken in tax returns, the effective settlement of matters subject to audit, new audit activity and changes in facts or circumstances related to a tax position. We evaluate our tax position on a quarterly basis. We also accrue for potential interest and penalties related to unrecognized tax benefits in income tax expense. We are subject to a territorial tax system under the Tax Cuts and Jobs Act enacted in December 2017, in which we are required to provide for tax on Global Intangible Low-Taxed Income ("GILTI") earned by certain foreign subsidiaries. We adopted an accounting policy to provide for the tax expense related to GILTI in the year the tax is incurred as a period expense.

In addition, we are subject to the continual examination of our income tax returns by the U.S. Internal Revenue Service and other domestic and foreign tax authorities. We regularly assess the likelihood of outcomes resulting from these examinations to determine the adequacy of our provision for income taxes and have reserved for potential adjustments that may result from such examinations. We believe such estimates to be reasonable; however, the final determination of any of these examinations could significantly impact the amounts provided for income taxes in our consolidated financial statements.

Recent accounting standards update

See Note 2, *"Summary of Significant Accounting Policies – Recent Accounting Standards Updates,"* to our consolidated financial statements included in this report for more information.

Results of Operations

The following discussion of the financial condition and results of operations should be read in conjunction with the accompanying consolidated financial statements and the related footnotes thereto.

Revenues

Total revenues for years ended December 31, 2024 and 2023 were comprised of the following:

	For the Years Ended December 31,		2024 vs 2023	
	2024	2023	$ Change	% Change
	(Amounts in thousands, except for percentage data)			
Revenue:				
Product	$ 634,178	$ 631,979	$ 2,199	0.3%
Royalty and other income	261	383	(122)	(31.9%)
Total revenue	$ 634,439	$ 632,362	$ 2,077	0.3%

Product revenues

Since 2016, we have been increasingly focused on selling our products directly to customers in the pharmaceutical industry and to our contract manufacturers. These direct sales have represented 89.7% of our total product revenue during 2024 compared to 85.8% of our total product revenue in 2023. Sales of our bioprocessing products can be impacted by the timing of large-scale production orders and the regulatory approvals for such antibodies, which may result in significant quarterly fluctuations.

Product revenues were comprised of the following:

	For the Years Ended December 31,	
	2024	2023
	(Amounts in thousands)	
Filtration products	$ 372,963	$ 341,379
Chromatography products	122,810	126,629
Process analytics products	59,301	56,820
Proteins products	74,425	103,463
Other	4,679	3,688
Total product revenue	$ 634,178	$ 631,979

Revenue from the sale of our products which make up our filtration, chromatography, process analytics and proteins franchises comes from the sale of a number of products as described in Part I, Item 1. "*Business - Our Products*" of this report. Other revenue primarily consists of revenue from the sale of our operating room products to hospitals as well as freight revenue.

In 2024, product revenue increased by $2.2 million, or 0.3%, as compared to 2023. The change is primarily driven by an increase of $31.6 million in our Filtration product revenue led by the success our of XCell ATF business. This increase was primarily offset by a decrease in our Proteins product revenue of $29.0 million, caused by headwinds in demand as Cytiva (a standalone operating company owned by Danaher Corporation) has moved certain ligand production in-house.

Royalty revenues

Royalty revenues for all periods presented relate to royalties received from a third-party systems manufacturer associated with our OPUS® chromatography columns. Royalty revenues are variable and are dependent on sales generated by our partner.

Costs and operating expenses

Total costs and operating expenses for the years ended December 31, 2024 and 2023 were comprised of the following:

	For the Years Ended December 31,		2024 vs 2023	
	2024	2023	$ Change	% Change
	(Amounts in thousands, except for percentage data)			
Cost of goods sold	$ 359,794	$ 353,922	$ 5,872	1.7%
Research and development	43,200	42,722	478	1.1%
Selling, general and administrative	263,368	218,584	44,784	20.5%
Contingent consideration	3,191	(30,569)	33,760	(110.4)%
Total costs and operating expenses	$ 669,553	$ 584,659	$ 84,894	14.5%

Cost of goods sold

In 2024, cost of goods sold increased $5.9 million, or 1.7%, compared to 2023, including an incremental $12.5 million of inventory adjustments compared to the prior year to reflect inventory at net realizable value, and an incremental $6.1 million charge compared to the prior year related to manufacturing facilities closed and equipment abandoned. These increases were partially offset by a decrease in accelerated depreciation of $3.8 million and a decrease in severance and employee related costs from restructuring of $1.2 million. See Note 6, "*Restructuring Activities and Other Inventory-Related Charges*" of this report for more information on the restructuring activities to simplify and streamline our organization and strengthen our overall effectiveness of our operations ("Restructuring Plan"). Our restructuring and other inventory-related activities include consolidating a portion of our manufacturing facilities between certain U.S. locations, writing-off abandoned equipment with the rationalization of excess production line capacity, discontinuing the sale of certain product SKUs, and evaluating the net realizable value of finished goods and raw materials. The non-cash inventory write-off in 2024 is the result of the Company discontinuing the sale of certain product SKUs and is also the result of the further evaluation of inventory positions in unusually turbulent market supply conditions. Where the value of finished goods and raw materials exceeded the projected requirements to be used before reaching their expiration date, or in a reasonable time horizon, they were written down to their realizable value.

The increase in restructuring changes was partially offset by a decrease in employee-related costs unrelated to the restructuring activities in 2024, as compared to 2023.

Gross margin was 43.3% in 2024, compared to 44.0% in 2023. The reduction in gross margin in 2024 as compared to 2023, is primarily due to restructuring activities as noted above during 2024 to simplify and streamline our organization and strengthen the overall effectiveness of our operations, which were $13.6 million higher in 2024 than 2023. Partially offsetting this increase in costs, margins increased as a result of a change in product mix.

Research and development expenses

R&D expenses are related to bioprocessing products, which include personnel, supplies and other research expenses. Due to the fact that these various programs share personnel and fixed costs, we do not track all of our expenses or allocate any fixed costs by program, and therefore, have not provided historical costs incurred by project.

R&D expenses increased $0.5 million, or 1.1%, during 2024, compared to 2023. The increase during the periods is primarily due to a $1.8 million increase in employee-related costs, partially offset by a decrease in product development costs of $1.4 million.

R&D expense also includes payments made to expand our proteins product offering through our development agreement with Navigo Proteins GmbH ("Navigo"). Such expenses were $3.1 million in 2024, $3.8 million in 2023, and $2.6 million in 2022 in the form of milestone payments to Navigo.

Selling, general and administrative expenses

Selling, general and administrative ("SG&A") expenses include the costs associated with selling our commercial products and costs required to support our marketing efforts, including legal, accounting, patent, shareholder services, amortization of intangible assets and other administrative functions.

SG&A costs increased by $44.8 million, or 20.5%, in 2024, as compared to 2023 primarily due to $22.4 million in costs associated with the modification of our former Chief Executive Officer's ("CEO") unvested equity awards resulting from the announcement of his transition from CEO to Executive Chair of our Board, which was announced on June 12, 2024 and effective September 1, 2024. For more information on the former CEO's transition to Executive Chair of our Board, see Note 13, "*Stockholders' Equity - Chief Executive Officer Accounting Modifications*" included in this report. In addition, employee-related costs increased $15.9 million, and rent increased $5.9 million primarily related to the expansion of our Waltham headquarters.

Contingent consideration

Contingent consideration represents the change in fair value of the contingent consideration obligation included in current and noncurrent contingent consideration on the consolidated balance sheets as of the end of each period. Remeasurement of the contingent consideration obligation is done each quarter and the carrying value of the obligation is adjusted to the current fair value through our consolidated statements of comprehensive income. In 2024, 2023 and 2022, actual and expected results and a change in market inputs used to calculate the discount rate, resulted in adjustments to the fair value of the contingent consideration obligation for the years ended December 31, 2024, 2023 and 2022 of $3.2 million, ($30.6) million, and ($28.7) million, respectively.

Other income (expenses), net

The table below provides detail regarding our other income (expenses), net:

	For the Years Ended December 31,		2024 vs 2023	
	2024	2023	$ Change	% Change
	(Amounts in thousands, except for percentage data)			
Investment income	$ 35,827	$ 24,135	$ 11,692	48.4%
Interest expense	(20,731)	(2,503)	(18,228)	728.2%
Loss on extinguishment of debt	—	(12,676)	12,676	100.0%
Amortization of debt issuance costs	(1,843)	(8,075)	6,232	(77.2)%
Other income (expenses)	(5,174)	8,123	(13,297)	(163.7)%
Total other income (expenses), net	$ 8,079	$ 9,004	$ (925)	(10.3)%

Investment income

Investment income includes income earned on invested cash balances. Our investment income increased by $11.7 million in 2024, as compared to 2023 due to having higher average invested cash balances since December 31, 2023. We expect investment income to vary based on changes in the amount of funds invested and fluctuation of interest rates.

Interest expense

Interest expense in 2024 is primarily from contractual coupon interest on the convertible debt outstanding as of December 31, 2024. On December 14, 2023, we entered into a privately negotiated exchange and subscription agreement with certain holders of the 2019 Notes and certain new investors pursuant to which we issued $600.0 million aggregate principal amount of the 2023 Notes. Interest expense in 2024 includes $0.1 million of interest on the 2019 Notes, compared to $1.0 million of interest expense on the 2019 Notes in 2023. Interest expense in 2024 also includes $6.0 million of contractual coupon interest on the 2023 Notes for which there were no comparable amounts in 2023 as well as $13.7 million in accretion of the $82.1 million debt discount on the modified notes, which includes the accretion of an increase in principal and the accretion of increased fair value of the conversion option in 2024, for which there were no comparable costs in 2023. See Note 15, *"Convertible Senior Notes,"* to our consolidated financial statements included in this report for more information on this transaction.

Loss on extinguishment of debt

In 2023, as part of the Exchange Transaction, we exchanged $217.7 million in aggregate principal amount of the 2019 Notes for $309.9 million in aggregate principal amount of the 2023 Notes. Upon evaluation of the Exchange Transaction, approximately $29.6 million, of the $217.7 million in aggregate principal amount of the 2019 Notes were deemed extinguished. As a result, we recorded a $12.7 million loss on extinguishment of debt in our consolidated statements of comprehensive income in 2023, which includes a $12.6 million write-off for the increase in principal of the converted notes being extinguished and a $0.1 million write-off of unamortized debt issuance costs related to the converted notes being extinguished. No such transactions occurred in 2024.

Amortization of debt issuance costs

Amortization of debt issuance costs decreased during 2024, as compared to 2023. Transaction costs related to the issuance of the 2019 Notes and the 2023 Notes are amortized to amortization of debt issuance costs on the consolidated statements of comprehensive income. Any third-party costs directly related to the modification or exchange are expensed as incurred. Therefore, in 2023, we recorded $6.4 million to amortization of debt issuance costs, which included $6.2 million of debt issuance costs directly related to the modified notes and $0.2 million of amortization of the capitalized debt issuance costs.

Other income (expenses), net

The changes in other expenses, net in 2024, as compared to 2023, is primarily attributable to realized and unrealized foreign currency gains and losses related to transactions with customers and vendors, as well as the revaluation impact of intercompany loans with subsidiaries.

Income tax (benefit) provision

Income tax (benefit) provision for the years ended December 31, 2024 and 2023 was as follows:

	For the Years Ended December 31,		2024 vs 2023	
	2024	2023	$ Change	% Change
	(Amounts in thousands, except for percentage data)			
Income tax (benefit) provision	$ (1,521)	$ 21,111	$ (22,632)	(107.2)%
Effective tax rate	5.6%	37.2%		

For year ended December 31, 2024, we recorded an income tax benefit of $1.5 million. The effective tax rate was 5.6% for 2024 and is based upon the net loss for the year ended December 31, 2024 and the composition of income in different jurisdictions. The difference in effective tax rates between 2024 and 2023 was primarily due to a loss before income taxes and nonrecurring nondeductible loss on extinguishment of debt and debt discount that occurred in 2023.

Liquidity and Capital Resources

We have financed our operations primarily through revenues derived from product sales, and the issuance of the Notes and public offerings. Most recently, the 2023 Notes issued in in December 2023. Our revenue for the foreseeable future will primarily be limited to our bioprocessing product revenue.

At December 31, 2024, we had cash and cash equivalents of $757.4 million compared to cash and cash equivalents of $751.3 million at December 31, 2023. There were no restrictions on cash as of December 31, 2024 and 2023.

In 2024, we acquired Tantti for $54.8 million in cash, net of cash acquired. In connection with the acquisitions, the Company has an obligation to pay up to $54.5 million (undiscounted) in contingent consideration earnout payments in cash over a three-year earnout period beginning January 1, 2025 and ending December 31, 2027. See Note 3, "*Fair Value Measurements,*" and Note 5, "*Acquisitions,*" for additional information.

On December 14, 2023, the Company issued $600.0 million aggregate principal amount of its 2023 Notes in a private placement pursuant to separate, privately negotiated exchange and subscription agreements (the "Exchange and Subscription Agreements") with a limited number of holders of its outstanding 2019 Notes and certain other qualified institutional buyers pursuant to Rule 144A under the Securities Act of 1933, as amended ("Securities Act"). Pursuant to the Exchange and Subscription Agreements, the Company exchanged $217.7 million of its 2019 Notes for $309.9 million aggregate principal amount of the 2023 Notes (the "Exchange Transaction") and issued $290.1 million aggregate principal amount of the 2023 Notes (the "Subscription Transactions") for $290.1 million in cash. Proceeds from the Subscription Transactions amounted to $276.1 million after debt issuance costs of $13.9 million. The 2023 Notes are senior, unsecured obligations of the Company, and bear interest at a rate of 1.00% per year. Interest is payable semi-annually in arrears on each June 15 and December 15, commencing on June 15, 2024. The 2023 Notes will mature on December 15, 2028, unless earlier redeemed, repurchased or converted. During the fourth quarter of 2024, the closing price of the Company's common stock did not exceed 130% of the conversion price of the 2023 Notes for more than 20 trading days of the last 30 consecutive trading days of the quarter. As a result, the 2023 Notes are not convertible at the option of the holders of the 2023 Notes during the fourth quarter of 2024, the quarter immediately following the quarter when the conditions are met, as stated in the indenture governing the 2023 Notes. For more information on the 2023 Notes, see Note 15, *Convertible Senior Notes*, to this report.

In 2024, we had lease arrangements for certain equipment and facilities including corporate and manufacturing sites. As of December 31, 2024, the Company had fixed lease payment obligations of $195.5 million, with $24.9 million payable within 12 months. See Note 7, *"Leases,"* for additional information.

In 2024, we had other purchase obligations primarily consisting of purchase commitments with certain vendors and open purchase orders for the procurement of raw materials for manufacturing. As of December 31, 2024, the Company had other purchase obligations of $31.0 million, payable within 12 months.

Cash flows

	For the Years Ended December 31,		2024 vs 2023
	2024	2023	$ Change
	(Amounts in thousands)		
Cash provided by (used in):			
Operating activities	$ 175,394	$ 113,918	$ 61,476
Investing activities	(86,383)	(123,275)	36,892
Financing activities	(82,902)	248,961	(331,863)
Effect of exchange rate changes on cash, cash equivalents and restricted cash	(77)	(11,739)	11,662
Net increase (decrease) in cash, cash equivalents and restricted cash	$ 6,032	$ 227,865	$ (221,833)

Operating activities

For 2024, our operating activities provided cash of $175.4 million reflecting net loss of $25.5 million and non-cash charges totaling $140.0 million primarily related to depreciation, intangible amortization, amortization of debt discount and issuance costs, contingent consideration fair value adjustments, deferred income taxes, stock-based compensation charges, loss on disposal of fixed assets, and right of use asset amortization. A decrease in inventory contributed $56.9 million to the change in working capital, of which $36.1 million was related to the Restructuring Plan and other inventory-related charges. Accounts payable and accrued expenses provided $19.0 million due to the timing of payments to vendors. Partially offsetting these favorable changes, accounts receivable increased $14.0 million due to timing of sales and receipts from customers.

For 2023, our operating activities provided cash of $113.9 million reflecting net income of $35.6 million and non-cash charges totaling $98.4 million primarily related to amortization of inventory step-up charges, depreciation expense, intangible amortization expense, amortization of debt discount and issuance costs, contingent consideration fair value adjustments, deferred income taxes, stock-based compensation charges, loss on extinguishment of debt and operating lease right of use asset amortization. A decrease in inventory provided $41.0 million of which $23.6 million was related to the Restructuring Plan. An increase in prepaid expenses, primarily related to prepaid taxes and insurance as well as subscriptions, consumed $13.3 million. A decrease in accounts payable and accrued expenses consumed $31.3 million and was due to the timing of payments to vendors as well as the payment of employee bonuses related to 2022 during 2023. The remaining cash provided by operating activities resulted from favorable changes in various other working capital accounts.

Investing activities

Our investing activities consumed $86.4 million of cash in 2024, primarily due to $54.8 million in cash (net of cash received) used for the 2024 acquisition of Tantti Laboratory Inc. Capital expenditures consumed $29.9 million in 2024, including $4.2 million of capitalized costs related to our internal-use software for 2024. In addition, in November 2024, the Company amended the License Agreement (the "Daylight Agreement") with DRS Daylight Solutions, Inc. ("Daylight") to extend the License Agreement one additional year for a one-time payment of $3.0 million.

Our investing activities consumed $123.3 million of cash in 2023, primarily due to $186.6 million in cash (net of cash received) used for the 2023 acquisitions of Metenova and FlexBiosys, in the aggregate. Capital expenditures consumed $39.0 million in 2023, as we continue to increase our manufacturing capacity worldwide. Of these expenditures, $2.8 million represented capitalized costs related to our internal-use software for 2023. These uses of cash were partially offset by the maturity of our short-term investment in U.S. treasury securities in June 2023, which provided cash of $102.3 million.

Financing activities

In 2024, cash consumed by financing activities was $82.9 million, driven primarily by the repayment of the 2019 Notes of $69.9 million, $9.9 million in cash disbursed for shares withheld to cover employee income tax due upon the vesting and release of restricted stock units, and $7.3 million paid to settle the cash portion of the contingent earnout obligation related to our acquisition of Avitide in September 2021. These payments were partially offset by proceeds received from stock option exercises during the period.

In 2023, cash provided by financing activities of $249.0 million included $290.1 million of proceeds from the issuance of the 2023 Notes in December 2023 and proceeds from stock option exercises during 2023 were $1.1 million. Offsetting these activities was $14.4 million for the buyback of 92,090 shares of our common stock, $13.2 million in cash disbursed for shares withheld to cover employee income tax due upon the

vesting and release of restricted stock units, $7.3 million paid for debt issuance costs related to the 2023 Notes and the payment of $7.3 million to settle the cash portion of the First Earnout Year contingent earnout obligation related to our acquisition of Avitide in September 2021.

Effect of exchange rate changes on cash, cash equivalents and restricted cash

The effect of exchange rate changes on cash during 2024 is a result of the strengthening of the U.S. dollar against the Swedish krona by 9%, the strengthening of the U.S. dollar against the Euro by 6% and the strengthening of the U.S. dollar against the British pound by 2%.

Capital Requirements

Our future capital requirements will depend on many factors, including the following:

- the expansion of our bioprocessing business;
- the ability to sustain sales and profits of our bioprocessing products and successfully integrate them into our business;
- our ability to acquire additional bioprocessing products;
- the scope of and progress made in our R&D activities;
- the scope of investment in our intellectual property portfolio;
- contingent consideration earnout payments resulting from our acquisitions;
- the extent of any share repurchase activity;
- the success of any proposed financing efforts;
- general economic and capital markets;
- change in accounting standards;
- the impact of inflation on our operations, including our expenditures on raw material and freight charges;
- fluctuations in foreign currency exchange rates; and
- costs associated with our ability to comply with emerging environmental, social and governance standards.

Absent acquisitions of additional products, product candidates or intellectual property, we believe our current cash balances and future cash flow from operations are adequate to meet our cash needs for at least the next 24 months. We expect operating expenses in 2025 to increase as we continue to expand our bioprocessing business. We expect to incur continued spending related to the development and expansion of our bioprocessing product lines and expansion of our commercial capabilities for the foreseeable future. Our future capital requirements may include, but are not limited to, purchases of property, plant and equipment, the acquisition of additional bioprocessing products and technologies to complement our existing manufacturing capabilities, and continued investment in our intellectual property portfolio.

We plan to continue to invest in our bioprocessing business and in key R&D activities associated with the development of new bioprocessing products. We actively evaluate various strategic transactions on an ongoing basis, including licensing or acquiring complementary products, technologies or businesses that would complement our existing portfolio. We continue to seek to acquire such potential assets that may offer us the best opportunity to create value for our shareholders. In order to acquire such assets, we may need to seek additional financing to fund these investments. If our available cash balances and anticipated cash flow from operations are insufficient to satisfy our liquidity requirements, for example, due to acquisition-related financing needs or lower demand for our products, among potential other events, we may seek to sell common or preferred equity or convertible debt securities, enter into a credit facility or another form of third-party funding, or seek other debt funding. The sale of equity and convertible debt securities may result in dilution to our shareholders, and those securities may have rights senior to those of our common shares. If we raise additional funds through the issuance of preferred stock, convertible debt securities or other debt financing, these securities or other debt could contain covenants that would restrict our operations. Any other third-party funding arrangement could require us to relinquish valuable rights. We may require additional capital beyond our currently anticipated amounts. Additional capital may not be available on reasonable terms, if at all.

Net Operating Loss Carryforwards

At December 31, 2024, we had federal net operating loss carryforwards of $19.3 million, state net operating loss carryforwards of $11.9 million, and foreign net operating loss carryforwards of $26.0 million. The federal net operating loss carryforwards have unlimited carryforward periods and do not expire. The state net operating loss carryforwards will expire at various dates through 2044. Approximately $4.8 million of the foreign net operating loss carryforwards have unlimited carryforward periods and do not expire, while $21.2 million of the foreign net operating loss carryforwards will expire at various dates through 2034. We had federal and state business tax credit carryforwards of $6.6 million available to reduce future federal and state income taxes. The business tax credit carryforwards will expire at various dates through 2044. Net operating loss carryforwards and available tax credits are subject to review and possible adjustment by the Internal Revenue Service, state and foreign jurisdictions and may be limited in the event of certain changes in the ownership interest of significant stockholders.

Foreign Earnings

As of December 31, 2024, we have accumulated undistributed earnings generated by our foreign subsidiaries of approximately $266.2 million. Because $5.7 million of such earnings have previously been subject to the one-time transition tax on foreign earnings required by the Tax Cuts and Jobs Act enacted in December 2017, any additional taxes due with respect to such earnings or the excess of the amount for financial reporting over the tax basis of our foreign investments would generally be limited to foreign and state taxes. At December 31, 2024, we have not provided for taxes on outside basis differences of our foreign subsidiaries as it is not practicable and we have the ability and intent to indefinitely reinvest the undistributed earnings of our foreign subsidiaries, and there are no needs for such earnings in the United States that would contradict our plan to indefinitely reinvest.

Effects of Inflation

Our assets are primarily monetary, consisting of cash and cash equivalents and marketable securities. Because of their liquidity, these assets are not directly affected by inflation. Since we intend to retain and continue to use our equipment, furniture, fixtures and office equipment, computer hardware and software and leasehold improvements, we believe that the incremental inflation related to replacement costs of such items will not materially affect our operations. However, the rate of inflation affects our expenses, such as those for employee compensation and contract services, which could increase our level of expenses and the rate at which we use our resources.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

We are exposed to market risk in the ordinary course of our business. Market risk represents the risk of loss that may impact our financial position due to adverse changes in financial market prices and rates. Our market risk exposure is primarily a result of fluctuations in interest rates and foreign currency exchange rates.

Interest Rate Risk

We have historically held investments in commercial paper, U.S. treasury and government securities as well as corporate bonds and other debt securities. As a result, we have been exposed to potential loss from market risks that may occur as a result of changes in interest rates, changes in credit quality of the issuer or otherwise. We do not have any such investments as of December 31, 2024. Our investment portfolio consists of cash and cash equivalents (cash and money market funds) that total $757.4 million on the consolidated balance sheets as of December 31, 2024. Our cash equivalent investments (money market funds) have short-term maturity periods that dampen the impact of market or interest rate risk. As a result, a hypothetical 100 basis point increase in interest rates would have no effect on our cash position as of December 31, 2024.

We manage our investment portfolio in accordance with our investment policy or approval by the Board of Directors. The primary objectives of our investment policy are to preserve principal, maintain a high degree of liquidity to meet operating and other needs, and obtain competitive returns subject to prevailing market conditions without significantly increasing risk. To achieve this objective, we maintain our portfolio of cash equivalents in high-quality securities, including money market funds.

Foreign Exchange Risk

The reporting currency of the Company is U.S. dollars, and the functional currency of each of our foreign subsidiaries is its respective local currency. Our foreign currency exposures include the Swedish krona, Euro, British pound, Chinese yuan, Japanese yen, Singapore dollar, South Korean won and Indian rupee; of these, the primary foreign currency exposures are the Swedish krona, Euro and Chinese yuan. Exchange gains or losses resulting from the translation between the transactional currency and the functional currency are included in net income. Fluctuations in exchange rates may adversely affect our results of operations, financial position and cash flows.

Although a majority of our contracts are denominated in U.S. dollars, 37.0% and 37.9% of total revenues were denominated in foreign currencies during 2024 and 2023, respectively.

We use foreign exchange forward contracts to hedge a portion of our exposures to changes in currency exchange rates which result from an intercompany loan with a subsidiary. We do not use derivative financial instruments for trading or speculative purposes. A hypothetical 10% change in currency exchange rates would not have a material impact on our consolidated financial statements.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

Financial statements and supplementary data required by Item 8 are set forth at the pages indicated in Item 15(a) below and are incorporated herein by reference.

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

None.

ITEM 9A. CONTROLS AND PROCEDURES

(a) Disclosure Controls and Procedures.

The Company's management, with the participation of our principal executive officer and principal financial officer, has evaluated the effectiveness of the Company's disclosure controls and procedures (as defined in Rules 13a-15(e) or 15d-15(e) under the Securities Exchange Act of 1934 ("Exchange Act") and as required by paragraph (b) of Rules 13a-15 or 15d-15 under the Exchange Act) as of the end of the period covered by this report. Based on such evaluation, our principal executive officer and principal financial officer have concluded that, as of December 31, 2024, the Company's disclosure controls and procedures were not effective as of such date due to material weaknesses in our internal control over financial reporting, as described below.

(b) Report of Management on Internal Control Over Financial Reporting.

Management of the Company is responsible for establishing and maintaining adequate internal control over financial reporting. Internal control over financial reporting is defined in Rule 13a-15(f) and 15d-15(f) under the Exchange Act as a process designed by, or under the supervision of, the Company's principal executive and principal financial officers and effected by the Company's Board of Directors ("Board"), management and other personnel, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with U.S. generally accepted accounting principles and includes those policies and procedures that:

- pertain to the maintenance of records that in reasonable detail accurately and fairly reflect the transactions and dispositions of the assets of the Company;
- 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
- 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.

Management assessed the effectiveness of the Company's internal control over financial reporting as of December 31, 2024. In making this assessment, management used the criteria established in Internal Control – Integrated Framework, issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (COSO).

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Projections of any evaluation of effectiveness to future periods are subject to the risks that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

We acquired Tantti Laboratory Inc. ("Tantti") on December 2, 2024 and the financial results of this acquisition are included in our audited consolidated financial statements as of December 31, 2024. The Company's consolidated total assets as of December 31, 2024 includes $78.1 million from the Tantti acquisition and no associated revenue. As this acquisition occurred during 2024, the scope of our assessment of our internal control over financial reporting does not include this acquisition. This exclusion is in accordance with the Securities and Exchange Commission's general guidance that an assessment of a recently acquired business may be omitted from our scope in the year of such acquisition.

In connection with our initiative to integrate and enhance our global information technology systems and business processes, we continued the phased implementation of our enterprise resource planning ("ERP") system. The Company is implementing the ERP system in phases and will continue until the current and future subsidiaries are using it. The sixth phase of implementation was in process as of December 31, 2024. We continue to execute certain existing internal controls over financial reporting related to our ERP system as of December 31, 2024.

As reported in the Company's December 31, 2023 Form 10-K/A, the Company previously identified the following material weaknesses in internal control over financial reporting:

1. Management identified a material weakness in the operation of our controls over the deferred income tax accounting for complex and non-routine transactions. Specifically, management did not have adequate supervision and review controls over the complex accounting for deferred income tax on the exchange of our outstanding 0.375% Convertible Senior Notes due 2024 and the issuance of 1.00% Convertible Senior Notes due 2028, including work performed by external advisors and the internal review of such transaction and related analyses. This material weakness did not result in an error in any of our previously issued consolidated financial statements including the consolidated financial statements as of and for the year ended December 31, 2023.
2. Management identified deficiencies related to the design and operating effectiveness of controls related to revenue recognition specific to the evaluation of accounting for contract terms. The Company has concluded that such deficiencies represented a material weakness as of December 31, 2023 and 2022.

As of December 31, 2024, the Company identified the following new material weaknesses in internal control over financial reporting:

1. Management did not maintain effective information technology ("IT") general controls for information systems that are relevant to the preparation of our financial statements. Specifically, we did not maintain logical access controls and program change management controls to ensure that access to programs and data are appropriately restricted and program and data changes are identified, tested, authorized, and implemented appropriately. As a result, automated and business process controls that rely on information from the systems were also deemed ineffective because they could have been adversely affected.
2. Irrespective of the effects of the IT general controls deficiencies, management did not perform certain business process-level controls related to inventory valuation and the financial statement close process either in a timely manner or with an appropriate precision threshold.

Based on these material weaknesses, the Company's management concluded that at December 31, 2024, the Company's internal control over financial reporting was not effective.

Remediation of a Previously Disclosed Material Weakness - Income tax accounting related to non-routine transactions

In connection with our 2024 financial statement close process, we designed and implemented enhanced internal controls over accounting for non-routine transactions that had income tax implications for the Company. This included performing additional control procedures over our acquisition of Tantti, which occurred in December 2024. Based upon the successful execution of the remediation plan previously disclosed and the testing and evaluation of the effectiveness of our internal control over financial reporting, we have concluded that the material weakness referred to above has been remediated and no longer existed as of December 31, 2024.

Remediation Plan – Material Weaknesses

Following identification of the material weaknesses identified above, and as part of our commitment to strengthen our internal control over financial reporting, we have and will continue to implement remedial actions under the oversight of the Audit Committee of our Board to address these deficiencies.

Our remediation activities include the following with respect to revenue recognition:

- Designing and implementing new internal controls to validate there is a complete listing of revenue contracts that have non-standard terms, which require incremental accounting analysis under ASC 606.
- Designing and implementing new internal controls evaluating the accounting for contract amendments, including amendments accounted for as contract modifications.
- Enhancing and expanding our existing revenue recognition control procedures and attributes when evaluating the accounting impact of non-standard contract terms and contract modifications.
- Increased education for internal resources on accounting for contracts within the scope of ASC 606 and deploying enablers to facilitate documentation of accounting analyses and conclusions.

Our remediation activities will include the following with respect to IT general controls:

- Reassessing the operating effectiveness of internal controls related to the program and data change management and user access processes; and
- Expanding the management and governance over IT system controls.

Our remediation activities will include the following with respect to certain business process-level controls:

- Reassessing the operating effectiveness of these controls, including precision thresholds, timely execution, and documentation requirements for control owners;
- Assessing the frequency of our control monitoring activities to ensure that they are conducted in a timely manner; and
- Hiring additional staff, including external experts, to enhance the performance, documentation, and monitoring of such controls. This includes providing training for control owners setting out expectations as it relates to the control risk and design, execution and monitoring of such controls, including enhancements to the documentation to evidence the execution of the control.

We expect to undertake significant remediation activities in the coming fiscal year, and expect to continue to execute, test, and assess the effectiveness of these controls as we progress into fiscal 2025.

Our CEO and CFO have certified that, based on their knowledge, our consolidated financial statements and other financial information included in this Amendment, fairly present, in all material respects, our financial condition, results of operations and cash flows as of, and for, the periods presented in this Amendment.

Ernst & Young LLP, the independent registered public accounting firm that audited our consolidated financial statements included in this Annual Report on Form 10-K, has issued an unqualified opinion on our consolidated financial statements and has issued an adverse opinion on the effectiveness of our internal control over financial reporting as of December 31, 2024.

(c) Attestation Report of the Independent Registered Public Accounting Firm.

Our independent registered public accounting firm, Ernst & Young LLP, which audited the financial statements included in this Form 10-K, containing the disclosure required by this Item, has issued an attestation report on the Company's internal control over financial reporting as of December 31, 2024, which is included below.

ATTESTATION REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Stockholders and the Board of Directors of Repligen Corporation

Opinion on Internal Control Over Financial Reporting

We have audited Repligen Corporation's internal control over financial reporting as of December 31, 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, because of the effect of the material weaknesses described below on the achievement of the objectives of the control criteria, Repligen Corporation (the Company) has not maintained effective internal control over financial reporting as of December 31, 2024, based on the COSO criteria.

As indicated in the accompanying Report of Management on Internal Control Over Financial Reporting, management's assessment of and conclusion on the effectiveness of internal control over financial reporting did not include the internal controls of Tantti Laboratory Inc. ("Tantti"), which is included in the 2024 consolidated financial statements of the Company and constituted $78.1 million of total assets as of December 31, 2024 and no associated revenue for the year then ended. Our audit of internal control over financial reporting of the Company also did not include an evaluation of the internal control over financial reporting of Tantti.

A material weakness is a deficiency, or combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of the company's annual or interim financial statements will not be prevented or detected on a timely basis. The following material weaknesses have been identified and included in management's assessment. Management has identified material weaknesses related to the Company's revenue recognition process, the operating effectiveness of IT general controls around logical access and change management in IT systems and the precision and timeliness of business process-level controls in the areas of inventory valuation and the financial statement close process.

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 December 31, 2024 and 2023, the related consolidated statements of comprehensive income (loss), stockholders' equity and cash flows for each of the three years in the period ended December 31, 2024, and the related notes. These material weaknesses were considered in determining the nature, timing and extent of audit tests applied in our audit of the 2024 consolidated financial statements, and this report does not affect our report dated March 13, 2025, which 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 Report of Management 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

Boston, Massachusetts
March 13, 2025

(d) Changes in Internal Control Over Financial Reporting

Excluding the material weaknesses identified above, there have been no changes in our internal control over financial reporting identified in connection with the evaluation required by paragraph (d) of Exchange Act Rule 13a-15 or Rule 15d-15 that occurred in the three months ended December 31, 2024 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting. Management believes the consolidated financial statements reflected in our current Amendment are accurately stated.

ITEM 9B. OTHER INFORMATION

Director and Officer Trading Plans and Arrangements

During the fourth quarter of 2024, Tony J. Hunt, Director and Executive Chair of the Board of Directors, adopted a trading plan intended to satisfy Rule 10b5-1(c) under the Securities Exchange Act of 1934 ("Exchange Act") on December 9, 2024 to sell up to 107,314 shares of our common stock between March 10, 2025 and November 25, 2025, the date this plan expires. The trading plan will cease upon the earlier of November 25, 2025 or the sale of all shares subject to the trading plan.

During the fourth quarter of 2024, Olivier Loeillot, our President and Chief Executive Officer, adopted a trading plan intended to satisfy Rule 10b5-1(c) under the Exchange Act on December 12, 2024 to sell up to 24,968 shares of our common stock between March 13, 2025 and December 12, 2025, the date this plan expires. The trading plan will cease upon the earlier of December 12, 2025 or the sale of all shares subject to the trading plan.

During the fourth quarter of 2024, Jason K. Garland, our Chief Financial Officer, adopted a trading plan intended to satisfy Rule 10b5-1(c) under the Exchange Act on December 13, 2024 to sell up to 1,579 shares of our common stock between May 5, 2025 and December 12, 2025, the date this plan expires. The trading plan will cease upon the earlier of December 12, 2025 or the sale of all shares subject to the trading plan.

ITEM 9C. DISCLOSURE REGARDING FOREIGN JURISDICTIONS THAT PREVENT INSPECTIONS

Not applicable.

PART III

Pursuant to General Instructions G to Form 10-K, the information required for Part III, Items 10, 11, 12, 13 and 14, is incorporated herein by reference from the Company's proxy statement for the 2025 Annual Meeting of Stockholders.

PART IV

ITEM 15. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES

The following documents are filed as part of this Annual Report on Form 10-K ("Form 10-K"):

(a) (1) *Financial Statements*:

The financial statements required by this item are submitted in a separate section beginning on page 68 of this report, as follows:

(a) (2) *Financial Statement Schedules*:

None.

(a) (3) *Exhibits*:

The Exhibits which are filed as part of this Form 10-K or which are incorporated by reference are set forth in the Exhibit Index hereto.

EXHIBIT INDEX

Exhibit Number	Document Description
3.1	Restated Certificate of Incorporation dated June 30, 1992, as amended September 17, 1999 (filed as Exhibit 3.1 to Repligen Corporation's Quarterly Report on Form 10-Q for the quarter ended September 30, 1999 and incorporated herein by reference).
3.2	Certificate of Amendment to the Certificate of Incorporation of Repligen Corporation, effective as of May 16, 2014 (filed as Exhibit 3.1 to Repligen Corporation's Current Report on Form 8-K filed on May 19, 2014 and incorporated herein by reference).
3.3	Certificate of Amendment to the Certificate of Incorporation of Repligen Corporation, effective as of May 19, 2023 (filed as Exhibit 3.1 to Repligen Corporation's Current Report on Form 8-K filed on May 22, 2023 and incorporated herein by reference).
3.4	Third Amended and Restated Bylaws (filed as Exhibit 3.1 to Repligen Corporation's Current Report on Form 8-K filed on January 28, 2021 and incorporated herein by reference).
4.1	Specimen Stock Certificate (filed as Exhibit 4.1 to Repligen Corporation's Annual Report on Form 10-K for the year ended March 31, 2002 and incorporated herein by reference).
4.2	Base Indenture, dated as of July 19, 2019, by and between Repligen Corporation and Wilmington Trust, National Association (filed as Exhibit 4.1 to Repligen Corporation's Current Report on Form 8-K filed on July 22, 2019 and incorporated herein by reference).
4.3	First Supplemental Indenture, dated as of July 19, 2019, by and between Repligen Corporation and Wilmington Trust, National Association (filed as Exhibit 4.2 to Repligen Corporation's Current Report on Form 8-K filed on July 22, 2019 and incorporated herein by reference).
4.4	Second Supplemental Indenture, dated as of March 4, 2022, by and between Repligen Corporation and Wilmington Trust, National Association, as trustee (filed as Exhibit 4.1 to Repligen Corporation's Form 8-K filed on March 8, 2022).
4.5	Form of 0.375% Convertible Senior Notes due 2024 (included in Exhibit 4.3).
4.6	Base Indenture, dated as of December 14, 2023, by and between Repligen Corporation and Wilmington Trust, National Association (filed as Exhibit 4.1 to Repligen Corporation's Current Report on Form 8-K filed on December 15, 2023 and incorporated herein by reference).
4.7	Form of 1.00% Convertible Senior Notes due 2028 (included in Exhibit 4.6).
4.8	Description of Certain Registrant's Securities (filed as Exhibit 4.5 to Repligen Corporation's Annual Report on Form 10-K for the year ended December 31, 2019 and incorporated by reference).
10.1*	Repligen Executive Incentive Compensation Plan (filed as Exhibit 10.1 to Repligen Corporation's Current Report on Form 8-K filed on December 14, 2005 and incorporated herein by reference).
10.2	Lease Between Repligen Corporation as Tenant and West Seyon LLC as Landlord, 35 Seyon Street, Waltham, MA (as amended to date) (filed as Exhibit 10.4 to Repligen Corporation's Annual Report on Form 10-K for the year ended December 31, 2019 and incorporated herein by reference).
10.3#	Strategic Supplier Alliance Agreement dated January 28, 2010 by and between Repligen Corporation and GE Healthcare Bio-Sciences AB (as amended to date) (filed as Exhibit 10.1 to Repligen Corporation's Quarterly Report on Form 10-Q for the quarter ended March 31, 2016 and incorporated herein by reference).
10.4*	Repligen Corporation Amended and Restated 2012 Stock Option and Incentive Plan (filed as Exhibit 99.1 to Repligen Corporation's Form S-8 filed on June 2, 2014 and incorporated herein by reference).
10.5*	Repligen Corporation Amended and Restated Non-Employee Directors' Compensation Policy.
10.6	Form of Indemnification Agreement (filed as Exhibit 10.1 to Repligen Corporation's Current Report on Form 8-K filed on May 12, 2016 and incorporated herein by reference).

10.7	Lease Agreement, dated February 6, 2018, by and between Repligen Corporation and U.S. REIF 111 Locke Drive Massachusetts, LLC (filed as Exhibit 10.1 to Repligen Corporation's Current Report on Form 8-K filed on February 8, 2018 and incorporated herein by reference).
10.8*	2018 Repligen Corporation Stock Option and Incentive Plan (filed as Exhibit 10.1 to Repligen Corporation's Quarterly Report on Form 10-Q for the quarter ended June 30, 2018 and incorporated herein by reference).
10.9*	Letter Agreement, dated as of September 3, 2016 by and between Repligen Corporation and Ralf Kuriyel (filed as Exhibit 10.17 to Repligen Corporation's Annual Report on Form 10-K for the year ended December 31, 2018 and incorporated herein by reference).
10.10*	Repligen Corporation Amended and Restated Severance and Change in Control Plan, effective as of May 26, 2022 (filed as Exhibit 10.1 to Repligen Corporation's Form 8-K filed June 1, 2022).
10.11*	Employment Agreement, dated as of June 12, 2024, by and between the Company and Olivier Loeillot (filed as Exhibit 10.2 to Repligen Corporation's Quarterly Report on Form 10-Q filed on July 30, 2024).
10.12*	Employment Agreement, dated as of September 8, 2023, by and between Repligen Corporation and Jason Garland (filed as Exhibit 10.1 to Repligen Corporation's Current Report on Form 8-K filed on September 12, 2023).
10.14	First Amendment to Lease Agreement, dated as of July 7, 2020 by and between Repligen Corporation and U.S. REIF 111 Locke Drive Massachusetts, LLC (filed as Exhibit 10.1 to Repligen Corporation's Current Report on Form 8-K filed on July 10, 2020 and incorporated herein by reference).
10.15*	Repligen Corporation 2018 Stock Option and Incentive Plan, Sub-Plan for French-Qualified Restricted Stock Units (filed as Exhibit 10.1 to Repligen Corporation's Form 10-Q for the quarter ended June 30, 2021 and incorporated herein by reference).
19.1	Repligen Corporation Amended and Restated Statement of Company Policy on Insider Trading and Disclosure & Trading Procedures for Insiders (filed as Exhibit 19.1 to Repligen Corporation's Annual Report on Form 10-K for the year ended December 31, 2023 and incorporated herein by reference).
21.1+	Subsidiaries of the Registrant.
23.1+	Consent of Ernst & Young LLP, Independent Registered Accounting Firm.
24.1+	Power of Attorney (included on signature page).
31.1+	Rule 13a-14(a)/15d-14(a) Certification.
31.2+	Rule 13a-14(a)/15d-14(a) Certification.
32.1++	Certification Pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
97.1	Repligen Corporation Compensation Recovery Policy (filed as Exhibit 97.1 to Repligen Corporation's Annual Report on Form 10-K for the year ended December 31, 2023 and incorporated herein by reference).
101.INS	Inline XBRL Instance Document-the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document.
101.SCH	Inline XBRL Taxonomy Extension Schema With Embedded Linkbase Documents.
104	Cover page formatted as Inline XBRL and contained in Exhibits 101.

Confidential treatment obtained as to certain portions.
* Management contract or compensatory plan or arrangement.
+ Filed electronically herewith.
++ Furnished herewith.

The exhibits listed above are not contained in the copy of the Annual Report on Form 10-K distributed to stockholders. Upon the request of any stockholder entitled to vote at the 2025 Annual Meeting, the Registrant will furnish that person without charge a copy of any exhibits listed above. Requests should be addressed to Repligen Corporation, 41 Seyon Street, Waltham, MA 02453.

ITEM 16. 10-K SUMMARY

We may voluntarily include a summary of information required by Annual Report on Form 10-K under Item 16. We have elected not to include such summary information.

SIGNATURES

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

REPLIGEN CORPORATION

Date: March 13, 2025

By: /S/ OLIVIER LOEILLOT

Oliver Loeillot

Chief Executive Officer

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below hereby makes, constitutes and appoints Olivier Loeillot and Jason K. Garland with full power to act without the other, his true and lawful attorney-in-fact and agent, with full power of substitution and resubstitution, for him and in his name, place and stead, in any and all capacities to sign any or all amendments to this Annual Report on Form 10-K, and to file the same with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorney-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorney-in-fact and agents of any of them, or any substitute or substitutes, lawfully do or cause to be done by virtue hereof.

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

Signature	Title	Date
/S/ OLIVIER LOEILLOT **Oliver Loeillot**	Chief Executive Officer and Director (Principal Executive Officer)	March 13, 2025
/S/ JASON K. GARLAND **Jason K. Garland**	Chief Financial Officer (Principal Financial and Accounting Officer)	March 13, 2025
/S/ TONY J. HUNT **Tony J. Hunt**	Executive Chair of the Board	March 13, 2025
/S/ KAREN DAWES **Karen Dawes**	Lead Independent Director	March 13, 2025
/S/ NICOLAS M. BARTHELEMY **Nicolas M. Barthelemy**	Director	March 13, 2025
/S/ CARRIE EGLINTON MANNER **Carrie Eglinton Manner**	Director	March 13, 2025
/S/ KONSTANTIN KONSTANTINOV **Konstantin Konstantinov**	Director	March 13, 2025
/S/ MARTIN D. MADAUS **Martin D. Madaus**	Director	March 13, 2025
/S/ ROHIN MHATRE **Rohin Mhatre**	Director	March 13, 2025
/S/ GLENN P. MUIR **Glenn P. Muir**	Director	March 13, 2025
/S/ MARGARET A. PAX **Margaret A. Pax**	Director	March 13, 2025

INDEX TO FINANCIAL STATEMENTS

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Stockholders and the Board of Directors of Repligen Corporation:

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Repligen Corporation (the Company) as of December 31, 2024 and 2023, the related consolidated statements of comprehensive income (loss), stockholders' equity and cash flows for each of the three years in the period ended December 31, 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 December 31, 2024 and 2023, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 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 December 31, 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 March 13, 2025 expressed an adverse 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.

Accounting for Tantti acquisition

Description of the Matter

As disclosed in Note 5 to the consolidated financial statements, during 2024 the Company completed the acquisition of Tantti Laboratory Inc. (Tantti) for total consideration of approximately $74.8 million. The transaction was accounted for as a business combination and included the recognition of a developed technology asset of $28.9 million.

Auditing the Company's accounting for the Tantti business combination was complex due to the significant estimation uncertainty in the Company's determination of the fair value of the acquired developed technology intangible asset of $28.9 million. The significant estimation uncertainty associated with the developed technology intangible asset was primarily due to the sensitivity of the underlying assumptions about the future performance of the acquired business. The significant assumptions used to estimate the value of the developed technology intangible asset included the discount rate and certain assumptions that form the basis of the forecasted results, including revenue growth rates and expectations related to technological obsolescence. These significant assumptions are forward looking and could be affected by future economic and market conditions.

How We Addressed the Matter in Our Audit	We tested the Company's controls over its accounting for acquisitions. Our tests included controls over the process supporting the recognition and measurement of the developed technology intangible asset. We also tested management's review control over the assumptions used in the valuation model. To test the estimated fair value of the developed technology intangible asset, our procedures included, among others, evaluating the Company's selection of the valuation methodologies, evaluating the methods and significant assumptions used by the Company, and evaluating the completeness and accuracy of the underlying data supporting the significant assumptions and the estimate. This included comparing the significant assumptions to current industry, market and economic trends, to the assumptions used to value similar assets in other acquisitions as well as the historical revenue growth rates for those similar assets, customer sales orders received subsequent to the acquisition date and sensitivity analyses. We involved our valuation professionals to assist in the evaluation of the methodologies used by the Company and to evaluate the significant assumptions included in the fair value estimates.

/s/ Ernst & Young LLP

We have served as the Company's auditor since 2002.

Boston, Massachusetts
March 13, 2025

REPLIGEN CORPORATION
CONSOLIDATED BALANCE SHEETS
(Amounts in thousands, except share data)

	December 31, 2024	December 31, 2023
ASSETS		
Current assets:		
Cash and cash equivalents	$ 757,355	$ 751,323
Accounts receivable, net of reserves of $1,832 and $2,122 at December 31, 2024 and December 31, 2023, respectively	134,115	124,161
Inventories, net	142,964	202,321
Prepaid expenses and other current assets	31,607	33,541
Total current assets	1,066,041	1,111,346
Noncurrent assets:		
Property, plant and equipment, net	197,738	207,440
Intangible assets, net	397,897	406,957
Goodwill	1,030,995	987,120
Deferred tax assets	749	1,530
Operating lease right of use assets	135,378	115,515
Other noncurrent assets	868	1,277
Total noncurrent assets	1,763,625	1,719,839
Total assets	$ 2,829,666	$ 2,831,185
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$ 32,134	$ 19,563
Operating lease liability	15,104	5,631
Current contingent consideration	17,126	12,983
Accrued liabilities	62,423	57,313
Convertible Senior Notes due 2024, net	—	69,452
Total current liabilities	126,787	164,942
Noncurrent liabilities:		
Convertible Senior Notes due 2028, net	525,567	510,143
Deferred tax liabilities	22,775	39,324
Noncurrent operating lease liability	145,576	126,578
Noncurrent contingent consideration	19,662	14,070
Other noncurrent liabilities	16,581	11,283
Total noncurrent liabilities	730,161	701,398
Total liabilities	856,948	866,340
Commitments and contingencies (Note 14)		
Stockholders' equity:		
Preferred stock, $0.01 par value, 5,000,000 shares authorized, no shares issued or outstanding	—	—
Common stock, $0.01 par value; 80,000,000 shares authorized; 56,091,677 shares at December 31, 2024 and 55,766,078 shares at December 31, 2023 issued and outstanding	561	558
Additional paid-in capital	1,617,336	1,569,227
Accumulated other comprehensive loss	(52,533)	(37,808)
Retained earnings	407,354	432,868
Total stockholders' equity	1,972,718	1,964,845
Total liabilities and stockholders' equity	$ 2,829,666	$ 2,831,185

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

REPLIGEN CORPORATION
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (LOSS)
(Amounts in thousands, except per share data)

	For the Years Ended December 31,		
	2024	**2023**	**2022**
Revenue:			
Products	$ 634,178	$ 631,979	$ 801,183
Royalty and other revenue	261	383	353
Total revenue	634,439	632,362	801,536
Costs and operating expenses:			
Cost of goods sold	359,794	353,922	345,830
Research and development	43,200	42,722	43,936
Selling, general and administrative	263,368	218,584	215,829
Contingent consideration	3,191	(30,569)	(28,729)
Total costs and operating expenses	669,553	584,659	576,866
Income (loss) from operations	(35,114)	47,703	224,670
Other income (expenses):			
Investment income	35,827	24,135	6,978
Interest expense	(20,731)	(2,503)	(1,162)
Loss on extinguishment of debt	—	(12,676)	—
Amortization of debt issuance costs	(1,843)	(8,075)	(1,815)
Other income (expenses)	(5,174)	8,123	(9,531)
Other income (expenses), net	8,079	9,004	(5,530)
(Loss) income before income taxes	(27,035)	56,707	219,140
Income tax (benefit) provision	(1,521)	21,111	33,181
Net (loss) income	$ (25,514)	$ 35,596	$ 185,959
(Loss) earnings per share:			
Basic	$ (0.46)	$ 0.64	$ 3.35
Diluted	$ (0.46)	$ 0.63	$ 3.24
Weighted average common shares outstanding:			
Basic	55,937	55,720	55,460
Diluted	55,937	56,377	57,455
Net (loss) income	$ (25,514)	$ 35,596	$ 185,959
Other comprehensive income (loss):			
Foreign currency translation adjustment	(14,725)	(3,414)	(17,508)
Comprehensive income (loss)	$ (40,239)	$ 32,182	$ 168,451

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

REPLIGEN CORPORATION
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
(Amounts in thousands, except share data)

	Common Stock					
	Number of Shares (#)	Par Value	Additional Paid-In Capital	Accumulated Other Comprehensive Income (Loss)	Accumulated Earnings/ (Deficit)	Total Stockholders' Equity
Balance at December 31, 2021	55,321,457	$ 553	$ 1,572,340	$ (16,886)	$ 194,060	$ 1,750,067
Net income	—	—	—	—	185,959	185,959
Issuance of common stock for debt conversion	21	1	(7)	—	—	(6)
Exercise of stock options and vesting of stock units	326,192	3	3,704	—	—	3,707
Tax withholding on vesting of restricted stock units	(89,972)	(1)	(17,017)	—	—	(17,018)
Stock-based compensation expense	—	—	27,316	—	—	27,316
Impact of the adoption of ASU 2020-06	—	—	(39,070)	—	17,253	(21,817)
Translation adjustment	—	—	—	(17,508)	—	(17,508)
Balance at December 31, 2022	55,557,698	$ 556	$ 1,547,266	$ (34,394)	$ 397,272	$ 1,910,700
Net income, as restated	—	—	—	—	35,596	35,596
Issuance of common stock for debt conversion	8	—	(13)	—	—	(13)
Exercise of stock options and vesting of stock units	251,886	3	1,073	—	—	1,076
Repurchase of common stock	(92,090)	(1)	(14,385)	—	—	(14,386)
Tax withholding on vesting of restricted stock units	(77,759)	(1)	(13,226)	—	—	(13,227)
Issuance of common stock pursuant to the acquisition of FlexBiosys, Inc.	31,415	—	5,465	—	—	5,465
Issuance of common stock pursuant to the acquisition of Metenova Holding AB	52,299	1	8,103	—	—	8,104
Issuance of common stock pursuant to the Avitide, Inc. contingent consideration earnout payment	42,621	—	7,229	—	—	7,229
Stock-based compensation expense	—	—	25,575	—	—	25,575
Convertible note modification	—	—	2,791	—	—	2,791
Deferred tax impact on conversion feature	—	—	(651)	—	—	(651)
Translation adjustment	—	—	—	(3,414)	—	(3,414)
Balance at December 31, 2023	55,766,078	$ 558	$ 1,569,227	$ (37,808)	$ 432,868	$ 1,964,845
Net loss	—	—	—	—	(25,514)	(25,514)
Conversion of debt	100,944	1	(115)	—	—	(114)
Exercise of stock options and vesting of stock units	248,108	3	4,294	—	—	4,297
Tax withholding on vesting of restricted stock units	(54,861)	(1)	(9,882)	—	—	(9,883)
Issuance of common stock pursuant to contingent consideration earnout payments	31,408	—	5,742			5,742
Stock-based compensation expense	—	—	48,070	—	—	48,070
Translation adjustment	—	—	—	(14,725)	—	(14,725)
Balance at December 31, 2024	56,091,677	$ 561	$ 1,617,336	$ (52,533)	$ 407,354	$ 1,972,718

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

REPLIGEN CORPORATION
CONSOLIDATED STATEMENTS OF CASH FLOWS
(Amounts in thousands)

	For the Years Ended December 31,		
	2024	**2023**	**2022**
Cash flows from operating activities:			
Net (loss) income	$ (25,514)	$ 35,596	$ 185,959
Adjustments to reconcile net (loss) income to net cash provided by operating activities:			
Inventory step-up charges	—	1,238	—
Depreciation and amortization	69,673	68,556	50,985
Amortization of debt discount and issuance costs	15,588	2,448	1,815
Stock-based compensation	48,070	25,575	27,316
Deferred income taxes, net	(16,790)	1,175	(1,352)
Contingent consideration	3,191	(30,569)	(28,729)
Non-cash interest income	—	(2,023)	—
Loss on extinguishment of debt	—	12,676	—
Loss on fixed asset abandonment	3,596	—	—
Operating lease right of use asset amortization	16,889	17,558	6,027
Other	(230)	1,783	(100)
Changes in operating assets and liabilities, excluding impact of acquisitions:			
Accounts receivable	(14,031)	(3,312)	(3,596)
Inventories	56,895	40,973	(57,204)
Prepaid expenses and other assets	1,553	(13,333)	2,396
Other assets	471	(461)	(231)
Accounts payable	12,898	(9,803)	(8,197)
Accrued expenses	6,106	(21,518)	(2,019)
Operating lease liability	(8,292)	(12,728)	(1,953)
Long-term liabilities	5,321	87	966
Total cash provided by operating activities	175,394	113,918	172,083
Cash flows from investing activities:			
Purchase of marketable securities held to maturity	—	—	(100,000)
Redemption of marketable securities	—	102,323	—
Additions to capitalized software costs	(4,222)	(2,766)	(3,512)
Acquisitions, net of cash acquired	(54,765)	(186,642)	—
Purchases of property, plant and equipment	(25,677)	(36,222)	(84,834)
Purchase of intellectual property	(3,006)	—	(45,000)
Other investing activities	1,287	32	110
Total cash used in investing activities	(86,383)	(123,275)	(233,236)
Cash flows from financing activities:			
Repurchase of common stock	—	(14,386)	—
Proceeds from issuance of 2023 Convertible Senior Notes	—	290,094	—
Proceeds from exercise of stock options	4,294	1,076	3,707
Payment of debt issuance costs	—	(7,253)	—
Payment of tax withholding obligation on vesting of restricted stock units	(9,882)	(13,227)	(17,018)
Payment of earnout consideration	(7,375)	(7,298)	—
Repayment of Convertible Senior Notes	(69,939)	—	—
Other financing activities	—	(45)	(26)
Total cash (used in) provided by financing activities	(82,902)	248,961	(13,337)
Effect of exchange rate changes on cash and cash equivalents	(77)	(11,739)	(5,866)
Net increase (decrease) in cash and cash equivalents	6,032	227,865	(80,356)
Cash and cash equivalents, beginning of period	751,323	523,458	603,814
Cash and cash equivalents, end of period	$ 757,355	$ 751,323	$ 523,458
Supplemental disclosure of cash flow information:			
Income taxes paid	$ 19,298	$ 26,963	$ 34,365
Interest paid	$ 6,070	$ 988	$ 1,033
Supplemental disclosure of non-cash investing and financing activities:			
Assets acquired under operating leases	$ 37,894	$ 4,335	$ 29,126
Fair value of shares of common stock issued for acquisitions	$ —	$ 13,569	$ —
Fair value of shares of common stock issued for contingent consideration earnouts	$ 5,742	$ 7,229	$ —
Acquisition date fair value of contingent consideration earnouts	$ 19,738	$ 6,640	$ —
Acquisition of intangible assets and issuance of financing liability	$ —	$ —	$ 6,948
Issuance of 2023 Notes in exchange of 2019 Notes	$ —	$ 42,179	$ —
Extinguished 2019 Notes	$ —	$ 29,634	$ —

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

1. Organization and Nature of Business

Repligen Corporation (NASDAQ: RGEN) is a global life sciences company that develops and commercializes highly innovative bioprocessing technologies and systems that increase efficiencies and flexibility in the process of manufacturing biological drugs. The Company's franchises include filtration, chromatography, process analytics and proteins. See Part I, Item 1. "*Business - Our Products",* of this report for additional information related to the Company's products. The Company's bioprocessing products are sold to major life sciences companies, biopharmaceutical development companies and contract manufacturing organizations worldwide. The Company operates under one reportable segment. The Company's chief operating decision maker ("CODM"), its Chief Executive Officer ("CEO"), reviews financial information presented on a consolidated basis for purposes of allocating resources and evaluating financial performance. See Note 2, *"Summary of Significant Accounting Policies – Segment Reporting,"* for more information on the Company's segment.

A majority of our 16 manufacturing sites are located in the United States (California, Massachusetts, New Hampshire, New Jersey, and New York). Outside the United States, we have manufacturing sites in Estonia, France, Germany, Ireland, the Netherlands, Sweden, and Taiwan.

The Company is subject to a number of risks typically associated with companies in the biotechnology industry. These risks principally include the Company's dependence on key customers, development by the Company or its competitors of new technological innovations, dependence on key personnel, protection of proprietary technology, compliance with the U.S. Food and Drug Association and other governmental regulations and approval requirements, as well as the ability to grow the Company's business and obtain adequate funding to finance this growth.

2. Summary of Significant Accounting Policies

Use of Estimates

The preparation of 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 at the date of the financial statements and the reported amounts of revenues and expenses during the reporting periods.

Significant estimates and assumptions by management affect the Company's revenue recognition for multiple element arrangements, the net realizable value of inventory, valuations and purchase price allocations related to business combinations, contingent consideration, estimated fair values of intangible assets and goodwill, amortization methods and periods, warranty reserves, certain accrued expenses, estimates related to the fair value of the conversion features of the convertible notes for purposes of assessing whether debt extinguishment or modification accounting applies to the Company's debt exchange, stock-based compensation, tax reserves and recoverability of the Company's net deferred tax assets and related valuation allowance.

Although the Company regularly assesses these estimates, actual results could differ materially from these estimates. Changes in estimates are recorded in the period in which they become known. The Company bases its estimates on historical experience and various other assumptions that it believes to be reasonable under the circumstances.

Basis of Presentation

The consolidated financial statements include the accounts of the Company and its wholly-owned subsidiaries. All significant intercompany accounts and transactions have been eliminated in consolidation.

Foreign Currency

The Company translates the assets and liabilities of its foreign subsidiaries at rates in effect at the end of the reporting period. Revenues and expenses are translated at average rates in effect during the reporting period. Translation adjustments include adjustments related to the Company's various intercompany loans with foreign subsidiaries. Intercompany loans determined to be permanent are remeasured at each period end and included in accumulated other comprehensive loss on the consolidated balance sheets. Intercompany loans with foreign subsidiaries determined to be repayable are remeasured at each period end and included in other income (expenses) on the

consolidated statements of comprehensive income. Exchange gains or losses resulting from the translation between the transactional currency and the functional currency are included in other income (expenses).

Revenue Recognition

The Company generates revenue from the sale of bioprocessing products, equipment devices, and related consumables used with these equipment devices to customers in the life sciences and biopharmaceutical industries. Under Accounting Standard Codification No. ("ASC") 606, "*Revenue from Contracts with Customers,*" revenue is recognized when, or as, obligations under the terms of a contract are satisfied, which occurs when control of the promised products or services is transferred to customers. Revenue is measured as the amount of consideration the Company expects to receive in exchange for transferring products or services to a customer ("transaction price"). To the extent the transaction price includes variable consideration, the Company estimates the amount of variable consideration that should be included in the transaction price utilizing the expected value method or the most likely amount method, depending on the facts and circumstances relative to the contract. Variable consideration is included in the transaction price if, in the Company's judgment, it is probable that a significant future reversal of cumulative revenue under the contract will not occur. Estimates of variable consideration and determination of whether to include estimated amounts in the transaction price are based largely on an assessment of the Company's anticipated performance and all information (historical, current and forecasted) that is reasonably available. Sales, value add, and other taxes collected on behalf of third parties are excluded from revenue.

When determining the transaction price of a contract, an adjustment is made if payment from a customer occurs either significantly before or significantly after performance, resulting in a significant financing component. Applying the practical expedient in paragraph 606-10-32-18, the Company does not assess whether a significant financing component exists if the period between when the Company performs its obligations under the contract and when the customer pays is one year or less. None of the Company's contracts contained a significant financing component as of December 31, 2024.

Contracts with customers may contain multiple performance obligations. For such arrangements, the transaction price is allocated to each performance obligation based on the estimated relative standalone selling prices of the promised products or services underlying each performance obligation. The Company determines standalone selling prices based on the price at which the performance obligation is sold separately. If the standalone selling price is not observable through past transactions, the Company estimates the standalone selling price taking into account available information such as market conditions and internally approved pricing guidelines related to the performance obligations.

The Company recognizes product revenue under the terms of each customer agreement upon transfer of control to the customer, which occurs at a point in time.

Shipping and handling fees are recorded as a component of product revenue, with the associated costs recorded as a component of cost of goods sold.

Risks and Uncertainties

The Company evaluates its operations periodically to determine if any risks and uncertainties exist that could impact its operations in the near term. The Company does not believe that there are any significant risks that have not already been disclosed in the consolidated financial statements. A loss of certain suppliers could temporarily disrupt operations, although alternate sources of supply exist for these items. The Company has mitigated these risks by working closely with key suppliers, identifying alternate sources and developing contingency plans.

Cash, Cash Equivalents and Restricted Cash

Cash and cash equivalents include cash on hand and on deposit. Highly liquid investments in money market mutual funds with an original maturity of three months or less are classified as cash equivalents. All cash equivalents are carried at cost, which approximates fair value. Restricted cash represents cash that is restricted as to withdrawal or usage. There was no restriction on the Company's cash balance as of December 31, 2024 and 2023.

The Company's cash and cash equivalents total as presented in the Company's consolidated statements of cash flows for the years ended December 31, 2024, 2023 and 2022 was $757.4 million, $751.3 million and $523.5 million, respectively.

Investment Securities

We classify our investment securities in one of three categories: held to maturity, trading, or available for sale. Our investment portfolio at December 31, 2022 consisted of an investment in U.S. treasury bills classified as held to maturity which was included in the Company's consolidated balance sheets under marketable securities held to maturity. These marketable securities matured in June 2023 and there are no comparable investments as of December 31, 2024 and 2023. Securities that we have the positive intent and ability to hold to maturity are classified as held to maturity and stated at amortized cost in the consolidated balance sheets. Management determines the appropriate classification of securities at the time of purchase based upon management's intent with regards to such investment and reevaluates such designation as of each balance sheet date. The Company's investment policy requires that it only invest in high-rated securities and limit its exposure to any single-user. There were no realized or unrealized gains or losses on investments recorded as of December 31, 2024, 2023 and 2022.

The Company classifies marketable securities as short-term when they have remaining contractual maturities of one year or less from the balance sheet date. The Company periodically assesses its marketable securities, if any, for impairment or credit losses.

Derivative Instruments

We use derivative financial instruments to manage exposure to foreign exchange risk, specifically foreign exchange forward contracts. Outstanding derivatives are recognized as assets or liabilities at their fair value. These forward contracts are not designated as hedging instruments, and the changes in fair value are recognized in other income (expense), net in the period of change. The gains and losses recorded in other income (expense), net for derivative instruments not designated as hedges were not material. We do not use derivative financial instruments for speculative or trading purposes

Fair Value Measurement

In determining the fair value of its assets and liabilities, the Company uses various valuation approaches. The Company employs a hierarchy for inputs used in measuring fair value that maximizes the use of observable inputs and minimizes the use of unobservable inputs by requiring that observable inputs be used when available. Observable inputs are inputs that market participants would use in pricing the asset or liability based on market data obtained from sources independent of the Company. Unobservable inputs are inputs that reflect the Company's assumptions about the inputs that market participants would use in pricing the asset or liability and are developed based on the best information available in the circumstances. The fair value hierarchy is broken down into three levels based on the source of inputs as follows:

Level 1 – Valuations based on unadjusted quoted prices in active markets for identical assets or liabilities that the Company has the ability to access.

Level 2 – Valuations based on quoted prices for similar assets or liabilities in active markets, quoted prices for identical or similar assets or liabilities.

Level 3 – Valuations based on inputs that are unobservable and significant to the overall fair value measurement.

The availability of observable inputs can vary among the various types of financial assets and liabilities. To the extent that the valuation is based on models or inputs that are less observable or unobservable in the market, the determination of fair value requires more judgment. In certain cases, the inputs used to measure fair value may fall into different levels of the fair value hierarchy. In such cases, for financial statement disclosure purposes, the level in the fair value hierarchy within which the fair value measurement is categorized is based on the lowest level input that is significant to the overall fair value measurement.

Convertible Instruments

The Company evaluates the embedded conversion feature within its convertible debt instruments under ASC 815, "*Derivatives and Hedging*." The Company refers to ASC 815-15 and ASC 815-40 to determine if the conversion feature meets the definition of a derivative and, if so, whether to bifurcate the conversion feature and account for it as a separate derivative liability. Based on the Company's analysis, its Convertible Senior Notes do not have an embedded conversion feature requiring bifurcation under ASC 815-15 and thus are accounted for as a single unit of account, a liability under ASC 470, "*Debt*."

Allowance for credit losses

We establish an allowance for credit losses through a review of several factors, including historical collection experience, current aging status of the customer accounts, and current financial condition of our customers. Losses are charged against the allowance when the customer accounts are determined to be uncollectible.

Inventories

Inventories relate to the Company's bioprocessing business. The Company values inventory at cost or, if lower, net realizable value, using the first-in, first-out method. The Company reviews its inventories at least quarterly and records a provision for excess and obsolete inventory based on its estimates of expected sales volume, production capacity and expiration dates of raw materials, work-in-process and finished products. The Company writes down inventory that has become obsolete, inventory that has a cost basis in excess of its expected net realizable value, and inventory in excess of expected requirements to cost of goods sold. Manufacturing of bioprocessing finished goods is done to order and tested for quality specifications prior to shipment.

A change in the estimated timing or amount of demand for the Company's products could result in additional provisions for excess inventory quantities on hand. Any significant unanticipated changes in demand or unexpected quality failures could have a significant impact on the value of inventory and reported operating results. Material adjustments related to a revised estimate of inventory valuations in 2024 and 2023 are discussed in Note 6, "*Restructuring Activities and Other Inventory-Related Charges.*"

Work-in-process and finished products inventories consist of material, labor, outside processing costs and manufacturing overhead.

Lease Accounting

The Company adopted Accounting Standards Update No. ("ASU") 2016-02, *"Leases (Topic 842)"* ("ASC 842") as of January 1, 2019. Under ASC 842, the Company determines whether the arrangement contains a lease at the inception of an arrangement. If a lease is identified in an arrangement, the Company recognizes a right-of-use asset and liability on its consolidated balance sheets and determines whether the lease should be classified as a finance or operating lease. The Company does not recognize assets or liabilities for leases with lease terms of less than 12 months.

A lease qualifies as a finance lease if any of the following criteria are met at the inception of the lease: (i) there is a transfer of ownership of the leased asset to the Company by the end of the lease term, (ii) the Company holds an option to purchase the leased asset that it is reasonably certain to exercise, (iii) the lease term is for a major part of the remaining economic life of the leased asset, (iv) the present value of the sum of lease payments equals or exceeds substantially all of the fair value of the leased asset, or (v) the nature of the leased asset is specialized to the point that it is expected to provide the lessor no alternative use at the end of the lease term. All other leases are recorded as operating leases.

Finance and operating lease assets and liabilities are recognized at the lease commencement date based on the present value of the lease payments over the lease term using the discount rate implicit in the lease. If the rate implicit is not readily determinable, the Company utilizes its incremental borrowing rate at the lease commencement date. Operating lease assets are further adjusted for prepaid or accrued lease payments. Operating lease payments are expensed using the straight-line method as an operating expense over the lease term. Finance lease assets are amortized to depreciation expense using the straight-line method over the shorter of the useful life of the related asset or the lease term. Finance lease payments are bifurcated into (i) a portion that is recorded as imputed interest expense and (ii) a portion that reduces the finance liability associated with the lease.

The Company does not separate lease and non-lease components when determining which lease payments to include in the calculation of its lease assets and liabilities. Variable lease payments are expensed as incurred. If a lease includes an option to extend or terminate the lease, the Company reflects the option in the lease term if it is reasonably certain it will exercise the option.

Finance leases are recorded in property, plant and equipment, net, other current liabilities and long-term finance lease liabilities and operating leases are recorded in operating lease right of use assets, operating lease liability and operating lease liability, long-term on the Company's consolidated balance sheets.

Certain of the Company's operating leases where the Company is the lessee provide for minimum annual payments that increase over the life of the lease. Some of these leases include obligations to pay for other services, such as operations and maintenance. For leases of property, the Company accounts for these other services as a component of the lease. The aggregate minimum annual payments are expensed on the straight-line basis beginning when the Company takes possession of the property and extending over the term of the related lease, including renewal options when the exercise of the option is reasonably certain as an economic penalty may be incurred if the option is not exercised. The Company also accounts in its straight-line computation for the effect of any "rental holidays."

Operating lease 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 arising from the lease. Operating lease assets and liabilities are recognized at the lease commencement date based on the estimated present value of the fixed lease payments, reduced by landlord incentives using a discount rate based on similarly secured borrowings available to the Company. Most of the leases do not provide implicit interest rates and therefore the Company determines the discount rate based on its incremental borrowing rate. The incremental borrowing rate for the Company's leases is determined based on lease term and currency in which the lease payments are made.

Accrued Liabilities

The Company estimates accrued liabilities by identifying services performed on the Company's behalf, estimating the level of service performed and determining the associated cost incurred for such service as of each balance sheet date. For example, the Company would accrue for professional and consulting fees incurred with law firms, audit and accounting service providers and other third-party consultants. These expenses are determined by either requesting those service providers to estimate unbilled services at each reporting date for services incurred or tracking costs incurred by service providers under fixed fee arrangements.

The Company has processes in place to estimate the appropriate amounts to record for accrued liabilities, which principally involve the applicable personnel reviewing the services provided. In the event that the Company does not identify certain costs that have begun to be incurred or the Company under or over-estimates the level of services performed or the costs of such services, the reported expenses for that period may be too low or too high. The date on which certain services commence, the level of services performed on or before a given date, and the cost of such services often require the exercise of judgment. The Company makes these judgments based upon the facts and circumstances known at the date of the consolidated financial statements.

Income Taxes

Deferred taxes are determined based on the difference between the consolidated financial statements and tax basis of assets and liabilities using enacted tax rates in effect in the years in which the differences are expected to reverse. Valuation allowances are provided, if, based upon the weight of available evidence, it is more likely than not that some or all of the deferred tax assets will not be realized. The Company accounts for uncertain tax positions using a "more-likely-than-not" threshold for recognizing and resolving uncertain tax positions. The evaluation of uncertain tax positions is based on factors including, but not limited to, changes in tax law, the measurement of tax positions taken or expected to be taken in tax returns, the effective settlement of matters subject to audit, new audit activity and changes in facts or circumstances related to a tax position. The Company evaluates this tax position on a quarterly basis. The Company also accrues for potential interest and penalties related to unrecognized tax benefits in income tax expense. The Company is subject to a territorial tax system under the Tax Cuts and Jobs Act enacted in December 2017, in which the Company is required to provide for tax on Global Intangible Low-Taxed Income ("GILTI") earned by certain foreign subsidiaries. The Company has adopted an accounting policy to provide for the tax expense related to GILTI in the year the tax is incurred as a period expense.

Property, Plant & Equipment

Property, plant & equipment is recorded at cost less allowances for depreciation. Depreciation is calculated using the straight-line method over the estimated useful life of the asset as follows:

Classification	Estimated Useful Life
Buildings	Thirty years
Leasehold improvements	Shorter of the term of the lease or estimated useful life
Equipment	Three to twelve years
Furniture, fixtures and office equipment	Three to eight years
Computer hardware and software	Three to seven years or estimated useful life
Vehicles	Five years

Upon disposal of property, plant & equipment, the cost of the asset and the accumulated depreciation are removed from the accounts and the resulting gain or loss is reflected in our results of operations. Fully depreciated assets are not removed from the accounts until they are physically disposed of.

Certain systems development costs related to the purchase, development and installation of computer software developed or obtained for internal use are capitalized and depreciated over the estimated useful life of the related project. Costs incurred prior to the development stage, as well as maintenance, training costs, and general and administrative expenses are expensed as incurred.

Earnings (Loss) Per Share

The Company reports earnings (loss) per share ("EPS") in accordance with ASC 260, *"Earnings Per Share,"* which establishes standards for computing and presenting EPS. Basic EPS is computed by dividing net income available to common shareholders by the weighted average number of common shares outstanding during the period. Diluted EPS is computed by dividing net income available to common shareholders by the weighted-average number of common shares and dilutive common share equivalents outstanding during the period. Potential common share equivalents consist of restricted stock awards (including performance stock units) and the incremental common shares issuable upon the exercise of stock options and warrants. Under the treasury stock method, unexercised "in-the-money" stock options are assumed to be exercised at the beginning of the period or at issuance, if later. The assumed proceeds are then used to purchase common shares at the average market price during the period. In periods when the Company has a net loss, stock awards are excluded from the calculation of earnings (loss) per share as their inclusion would have an antidilutive effect.

A reconciliation of basic and diluted weighted average share outstanding is as follows:

	For the Years Ended December 31,		
	2024	2023	2022
	(Amounts in thousands, except per share data)		
Numerator:			
Net (loss) income	$ (25,514)	$ 35,596	$ 185,959
Effect of dilutive securities:			
Charges associated with convertible debt instruments, net of tax	—	—	387
Numerator for diluted earnings per share - net income available to common stockholders after the effect of dilutive securities	$ (25,514)	$ 35,596	$ 186,346
Denominator:			
Weighted average shares used in computing net income per share - basic	55,937	55,720	55,460
Effect of dilutive shares:			
Options and stock units	—	457	608
Convertible senior notes[1]	—	181	1,360
Contingent consideration	—	8	11
Dilutive effect of unvested performance stock units	—	11	16
Dilutive potential common shares	—	657	1,995
Denominator for diluted (loss) earnings per share - adjusted weighted average shares used in computing net income per share - diluted	55,937	56,377	57,455
(Loss) earnings per share:			
Basic	$ (0.46)	$ 0.64	$ 3.35
Diluted	$ (0.46)	$ 0.63	$ 3.24

(1) Represents the dilutive impact for the Company's 0.375% Convertible Senior Notes due 2024 (the " 2019 Notes") and its 1.00% Convertible Senior Notes due 2028 (the "2023 Notes").

As the Company was in a net loss position for the year ended December 31, 2024, 422,325 shares of potentially dilutive options and restricted stock units are considered anti-dilutive. For the year ended December 31, 2024, 422,130 shares of the Company's common stock were excluded from the calculation of diluted (loss) earnings per share because the exercise prices of the stock options were greater than or equal to the average price of the common shares and were therefore anti-dilutive. For the years ended December 31, 2023 and 2022, 306,849 shares and 177,318 shares, respectively, of the Company's common stock were excluded from the calculation of diluted earnings per share because they would have had an anti-dilutive effect for years presented.

In July 2019, the Company issued $287.5 million aggregate principal amount of its 2019 Notes. As provided by the terms of the indenture underlying the 2019 Notes, prior to March 4, 2022, conversion of the 2019 Notes could have been settled in cash, shares of the Company's common stock or a combination thereof, at the Company's election. On March 4, 2022, we entered into the Second Supplemental Indenture for the 2019 Notes, which irrevocably elected to settle the conversion of the 2019 Notes using a combination of cash and shares of the Company's common stock, settling the par value of the 2019 Notes in cash and any excess conversion premium in shares. On December 14, 2023, the Company exchanged, in a privately negotiated exchange, $309.9 million principal amount of 2023 Notes for $217.7 million principal amount of 2019 Notes and issued $290.1 million aggregate principal amount of 2023 Notes for $290.1 million in cash. Following the close of the Exchange Transaction, $69.7 million in aggregate principal amount of 2019 Notes remains outstanding with terms unchanged.

As provided by the terms of the Second Supplemental Indenture underlying the 2019 Notes, the Company irrevocably elected to settle the conversion obligation for the 2019 Notes in a combination of cash and shares of the Company's common stock. This means the Company will settle the par value of the 2019 Notes in cash and any excess conversion premium in shares. As mentioned in Note 15, "*Convertible Senior Notes*," the Company adopted ASU 2020-06 effective January 1, 2022. Under ASU 2020-06, the Company is required to reflect the dilutive effect of the convertible securities by application of the "if-converted" method, which means the denominator of the EPS calculation would include the total number of shares assuming the 2019 Notes had been fully converted at the beginning of the period. Prior

to March 4, 2022, the Company had the choice to settle the conversion of the 2019 Notes in cash, stock or a combination of the two. Therefore, from January 1, 2022 (the date the Company adopted ASU 2020-06) to March 4, 2022, the Company included 3,474,429 shares in the denominator of the EPS calculation, applying the if converted method. Subsequent to March 4, 2022, after the Second Supplemental Indenture became effective, the Company irrevocably elected to settle the conversion obligation for the 2019 Notes in a combination of cash and shares of the Company's common stock, and from March 5, 2022 forward, only the excess premium will be settled with shares. Under the if-converted method of calculating dilutive shares, the Company was also required to exclude amortization of debt issuance costs and interest charges applicable to the convertible debt from the numerator of the dilutive EPS calculation for the period from January 1, 2022 to March 4, 2022, as if the interest on convertible debt was never recognized for that period. As a result, the Company excluded interest charges of $0.4 million (net of tax) from the numerator and included 1,359,957 shares in the calculation of diluted earnings as the dilutive effect of the conversion premium for the year ended December 31, 2022. There were no comparable amounts included in 2024 or 2023.

Segment Reporting

Operating segments are components of an enterprise that engage in business activities for which discrete financial information is available and regularly reviewed by the CODM in deciding how to allocate resources and assess performance. Our CEO has been identified as our CODM.

The Company views its operations, makes decisions regarding how to allocate resources and manages its business as one reportable segment and one reporting unit. Net (loss) income as reported on the consolidated statement of comprehensive (loss) income is the measure of segment profit or loss used by the CODM in allocating resources and assessing performance. As a result, the financial information disclosed herein represents all of the material financial information related to the Company.

The following table represents product revenues by product line:

	For the Years Ended December 31,		
	2024	2023	2022
	(Amounts in thousands)		
Filtration products	$ 372,963	$ 341,379	$ 495,930
Chromatography products	122,810	126,629	131,680
Process analytics products	59,301	56,820	53,512
Proteins products	74,425	103,463	114,320
Other	4,679	3,688	5,741
Total product revenue	$ 634,178	$ 631,979	$ 801,183

The following table represents the Company’s total revenue by our country of domicile (the United States) and other countries where our major subsidiaries are domiciled for the periods presented (based on the location of the customer):

	For the Years Ended December 31,		
	2024	2023	2022
Revenue by customers' geographic locations:			
North America	50%	44%	43%
Europe	34%	36%	37%
APAC/Other	16%	20%	20%
Total revenue	100%	100%	100%

The following table represents the Company's total assets by our country of domicile (the United States) and other countries where our major subsidiaries are domiciled for the periods presented:

	December 31,	
	2024	2023
	(Amounts in thousands)	
Total assets by geographic locations:		
North America	$ 2,305,538	$ 2,377,868
Europe	410,284	426,148
APAC	113,844	27,169
Total assets by geographic location	$ 2,829,666	$ 2,831,185

The following table represents the Company's long-lived assets by our country of domicile (the United States) and other countries where our major subsidiaries are domiciled for the periods presented:

	December 31,	
	2024	2023
	(Amounts in thousands)	
Long-lived assets by geographic locations:		
North America	$ 284,868	$ 278,033
Europe	45,650	43,280
APAC	3,466	2,919
Total long-lived assets by geographic location	$ 333,984	$ 324,232

The following table presents the Company's significant segment expenses which are regularly provided to the CODM for the single reportable segment:

	For the Years Ended December 31,		
	2024	2023	2022
Total revenue	$ 634,439	$ 632,362	$ 801,536
Costs and operating expenses:			
Cost of goods sold	359,794	353,922	345,830
Research and development	43,200	42,722	43,936
Sales and marketing	92,009	78,483	76,043
General and administrative	174,550	109,532	111,057
Total costs and operating expenses	669,553	584,659	576,866
Other income (expenses), net	8,079	9,004	(5,530)
Income tax (benefit) provision	(1,521)	21,111	33,181
Net (loss) income	$ (25,514)	$ 35,596	$ 185,959

Concentrations of Credit Risk and Significant Customers

Financial instruments that subject the Company to significant concentrations of credit risk primarily consist of cash and cash equivalents, marketable securities and accounts receivable. Per the Company's investment policy, cash equivalents and marketable securities are invested in financial instruments with high credit ratings, limit its credit exposure to any one issuer (with the exception of U.S. treasury obligations) and type of instrument is limited. At December 31, 2024, the Company had no investments associated with foreign exchange contracts or options contracts. As of December 31, 2024, the Company used derivative financial instruments to manage exposure to foreign exchange risk on certain repayable intercompany loans with foreign subsidiaries, specifically foreign exchange forward contracts.

Concentration of credit risk with respect to accounts receivable is limited to customers to whom the Company makes significant sales. While a reserve for the potential write-off of accounts receivable is maintained, the Company has not written off any significant accounts to date. To control credit risk, the Company performs regular credit evaluations of its customers' financial condition.

There was no revenue from customers that represented 10% or more of the Company's total revenue for the years ended December 31, 2024, 2023 or 2022.

No accounts receivable balance from a specific customer represented 10% or more of the Company's total trade accounts receivable at December 31, 2024 and 2023.

Business Combinations, Goodwill and Intangible Assets

Business Combinations

Total consideration transferred for acquisitions is allocated to the tangible and intangible assets acquired and liabilities assumed, if any, based on their fair values at the dates of acquisition. This purchase price allocation process requires management to make significant estimates and assumptions with respect to intangible assets and deferred revenue. The fair value of identifiable intangible assets is based on detailed valuations that use information and assumptions determined by management. Any excess of purchase price over the fair value of the net tangible and intangible assets acquired is allocated to goodwill. While the Company uses its best estimates and assumptions to accurately value assets acquired and liabilities assumed at the acquisition date as well as any contingent consideration, where applicable, the Company's estimates are inherently uncertain and subject to refinement. As a result, during the measurement period, which may be up to one year from the acquisition date, the Company records adjustments to the assets acquired and liabilities assumed with the corresponding offset to goodwill. Upon conclusion of the measurement period or final determination of the values of assets acquired or liabilities assumed, whichever comes first, any subsequent adjustments are recorded to the Company's consolidated statements of comprehensive income. The fair value of contingent consideration includes estimates and judgments made by management regarding the probability that future contingent payments will be made and the extent of royalties to be earned in excess of the defined minimum royalties. Management updates these estimates and the related fair value of contingent consideration at each reporting period. These changes in the fair value of contingent consideration are recorded to contingent consideration in the Company's consolidated statements of comprehensive income. For the years ended December 31, 2024, 2023, and 2022 we recorded an increase of $3.2 million, decrease of $(30.6) million, and decrease of $(28.7) million, respectively, to the estimated contingent consideration obligation, primarily related to the acquisition of Avitide (the "Avitide Acquisition").

The Company uses the income approach to determine the fair value of certain identifiable intangible assets including customer relationships and developed technology. This approach determines fair value by estimating after-tax cash flows attributable to these assets over their respective useful lives and then discounting these after-tax cash flows back to a present value. The Company bases its assumptions on estimates of future cash flows, expected growth rates, expected trends in technology, etc. Discount rates used to arrive at a present value as of the date of acquisition are based on the time value of money and certain industry-specific risk factors. The Company believes the estimated purchased customer relationships, developed technologies, trademark/tradename, patents, non-compete agreements and in-process research and development amounts so determined represent the fair value at the date of acquisition, and do not exceed the amount a third-party would pay for such assets.

Goodwill

Goodwill is not amortized and is tested for impairment at least annually at the reporting unit level. The Company operates as one reporting unit as of the goodwill impairment measurement date of October 1, 2024. During the qualitative assessment of the Company's one reporting unit during the 2024 goodwill impairment testing, it was determined that it was not more likely than not that its fair value was less than its carrying amount. As such, a quantitative impairment assessment was not required as of October 1, 2024. If an event occurs or circumstances change that would more likely than not reduce the fair value of its reporting unit below its carrying value, the Company will evaluate its goodwill for impairment between annual tests. There was no impairment to goodwill and therefore no impairment charge recorded for the years ended December 31, 2024, 2023 and 2022.

Prior to fiscal year 2024, testing of impairment on our goodwill occurred annually as of our measurement date of December 31st, pursuant to Company policy. Subsequent to the 2023 annual impairment test, which was completed on December 31, 2023, we voluntarily changed our annual impairment assessment date from December 31st to October 1st, the first day of our fourth quarter, beginning on October 1, 2024. The change is being made to better align the annual impairment assessment date with our annual planning and budgeting process as well as the long-term planning and forecasting process. We have determined that this voluntary change in accounting principle is preferable and will not impact our consolidated financial statements nor is it being done to accelerate, avoid or trigger an impairment

charge. This change is not going to be applied retrospectively as it is impracticable to do so because retrospective application would require application of significant estimates and assumptions with the use of hindsight. Therefore, the change will be applied prospectively.

Intangible Assets

Intangible assets with a definite life are amortized over their useful lives using the straight-line method and the amortization expense is recorded within cost of goods sold, research and development ("R&D") and selling, general and administrative expense in the consolidated statements of comprehensive income. Intangible assets and their related useful lives are reviewed at least annually to determine if any adverse conditions existed that would indicate the carrying value of these assets may not be recoverable. More frequent impairment assessments are conducted if certain conditions exist, including a change in the competitive landscape, any internal decisions to pursue new or different technology strategies, a loss of a significant customer, or a significant change in the marketplace, including changes in the prices paid for the Company's products or changes in the size of the market for the Company's products. If impairment indicators are present, the Company determines whether the underlying intangible asset is recoverable through estimated future undiscounted cash flows. If the asset is not found to be recoverable, it is written down to the estimated fair value of the asset based on the sum of the future discounted cash flows expected to result from the use and disposition of the asset. If the estimate of an intangible asset's remaining useful life is changed, the remaining carrying amount of the intangible asset is amortized prospectively over the revised remaining useful life. The Company continues to believe that its definite-lived intangible assets are recoverable at December 31, 2024.

Indefinite-lived intangible assets are reviewed for impairment at least annually. There has been no impairment of our intangible assets for the periods presented.

Stock Based Compensation

The Company measures stock-based compensation cost at the grant date based on the estimated fair value of the award and recognizes it as an expense over the employee's requisite service period on a straight-line basis. The Company records the expense for share-based awards subject to performance-based milestone vesting over the remaining service period when management determines that achievement of the milestone is probable. Management evaluates whether the achievement of a performance-based milestone is probable as of the reporting date. The Company has no awards that are subject to market conditions. The Company recognizes stock-based compensation expense based upon options that are ultimately expected to vest, and accordingly, such compensation expense has been adjusted by an amount of estimated forfeitures.

The Company uses the Black-Scholes option pricing model to calculate the fair value of share-based awards on the grant date. The following assumptions are used in calculating the fair value of share-based awards:

Expected term – The expected term of options granted represents the period of time for which the options are expected to be outstanding. For purposes of estimating the expected term, the Company has aggregated all individual option awards into one group as the Company does not expect substantial differences in exercise behavior among its employees.

Expected volatility – The expected volatility is a measure of the amount by which the Company's stock price is expected to fluctuate during the expected term of options granted. The Company determines the expected volatility based primarily upon the historical volatility of the Company's common stock over a period commensurate with the option's expected term.

Risk-free interest rate – The risk-free interest rate is the implied yield available on U.S. treasury zero-coupon issues with a remaining term equal to the option's expected term on the grant date.

Expected dividend yield – The Company has never declared or paid any cash dividends on any of its capital stock and does not expect to do so in the foreseeable future. Accordingly, the Company uses an expected dividend yield of zero to calculate the grant-date fair value of a stock option.

Estimated forfeiture rates – The Company has applied, based on an analysis of its historical forfeitures, annual forfeiture rates of 8% for awards granted to non-executive level employees, 3% for awards granted to executive level employees and 0% for awards granted to non-employee members of the Board of Directors ("Board") to all unvested stock options as of December 31, 2024. The Company reevaluates this analysis periodically and adjusts these estimated forfeiture rates as necessary. Ultimately, the Company will only recognize an expense for those shares that vest.

Advertising Costs

The Company expenses advertising costs as they are incurred. Advertising expense for the years ended December 31, 2024, 2023 and 2022 was $0.7 million, $0.8 million and $0.6 million, respectively.

Recent Accounting Standards Updates

We consider the applicability and impact of all ASUs and other accounting guidance on the Company's consolidated financial statements. Updates not listed below were assessed and determined to be either not applicable or are expected to have minimal impact on the Company's consolidated financial position or results of operations. Recently issued accounting guidance that we feel may be applicable to the Company are as follows:

Recently Issued Accounting Guidance – Adopted During the Fiscal Year

In November 2023, the FASB issued ASU 2023-07, "S*egment Reporting (Topic 820) - Improvements to Reportable Segment Disclosures."* ASU 2023-07 will improve reportable segment disclosure requirements, primarily through enhanced annual and interim disclosures about significant segment expenses that are regularly provided to the CODM. ASU 2023-07 was effective for the Company for annual periods beginning on January 1, 2024 and interim periods beginning on January 1, 2025. The amendments of this guidance apply retrospectively to all prior periods presented in the consolidated financial statements. The adoption of this guidance did not have a material impact on the Company's consolidated financial statements and disclosures and is reflected in Note 2, *"Summary of Significant Accounting Policies – Segment Reporting."*

Recently Issued Accounting Guidance – Not Yet Adopted

In November 2024, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") 2024-03, *"Income Statement - Reporting Comprehensive Income (Topic 220): Disaggregation of Income Statement Expenses."* The ASU requires additional disclosures by disaggregating the costs and expense line items that are presented on the face of the income statement. The disaggregation includes: (i) amounts of purchased inventory, employee compensation, depreciation, amortization, and other related costs and expenses; (ii) an explanation of costs and expenses that are not disaggregated on a quantitative basis; and (iii) the definition and total amount of selling expenses. The ASU is effective for our Annual Report on Form 10-K beginning in 2027 and subsequent interim reports. Early adoption is permitted. The ASU should be applied prospectively. Retrospective application is permitted for all prior periods presented in the financial statements. We are currently evaluating the impact of adopting this ASU on our financial reporting disclosures.

In March 2024, the SEC adopted final rules under SEC Release No. 33-11275 requiring public companies to provide certain climate-related information in their registration statements and annual reports. As part of the disclosures, registrants will be required to quantify certain effects of severe weather events and other natural conditions in a note to their audited financial statements. The rules were immediately challenged in a number of lawsuits, which were subsequently consolidated by the U.S. Court of Appeals for the Eighth Circuit. In April 2024, the SEC announced that it is staying implementation of the new rules pending resolution of the consolidated litigation before the Eighth Circuit. The Company is assessing the effect of compliance with the new rules on its condensed consolidated financial statements and related disclosures.

In December 2023, the FASB issued ASU 2023-09, "*Income Taxes (Topic 740) - Improvements to Income Tax Disclosures."* ASU 2023-09 enhances the transparency and decision usefulness of income tax disclosures by requiring consistent categories and greater disaggregation of information in the rate reconciliation and income taxes paid disaggregated by jurisdiction. ASU 2023-09 will be effective for the Company in its income tax disclosure included in its 2025 Annual Report on Form 10-K and will be applied on a prospective basis.

However, retrospective application is permitted. Early adoption is also permitted. Besides a change in income tax disclosures, the Company does not expect the adoption of ASU 2023-09 to have a material impact on its consolidated financial statements.

3. Fair Value Measurements

Cash, Cash Equivalents and Marketable Securities Held to Maturity

The following table summarizes the Company's cash, cash equivalents and marketable securities held to maturity as of December 31, 2024:

	As of December 31, 2024			
	Amortized Costs	Gross Unrealized Gains	Gross Unrealized Losses	Estimated Fair Value
Cash and cash equivalents:				
Cash and money market funds	$ 757,355	$ —	$ —	$ 757,355
Total cash and cash equivalents	$ 757,355	$ —	$ —	$ 757,355

	As of December 31, 2023			
	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Estimated Fair Value
Cash and cash equivalents:				
Cash and money market funds	$ 751,323	$ —	$ —	$ 751,323
Total cash and cash equivalents	$ 751,323	—	—	$ 751,323

During the fourth quarter of 2022, the Company purchased $100.0 million of 6-month U.S. treasury bills with the positive intent and ability to hold them until maturity. Therefore, the Company classified this investment as held to maturity and stated it at amortized cost on the consolidated balance sheets. There is no comparable investment as of December 31, 2024 or 2023.

Fair Value of Other Financial Instruments

The fair value of outstanding foreign exchange forward contracts are marked to market price at the end of each measurement period.

Fair Value Measured on a Recurring Basis

Financial assets and financial liabilities measured at fair value on a recurring basis consist of the following as of December 31, 2024 and 2023:

	As of December 31, 2024			
	Level 1	Level 2	Level 3	Total
Assets:				
Money market accounts	$ 687,253	$ —	$ —	$ 687,253
Foreign exchange forward contracts	$ —	$ 287	$ —	$ 287
Liabilities:				
Current contingent consideration	$ —	$ 17,126	$ —	$ 17,126
Noncurrent contingent consideration	$ —	$ —	$ 19,662	$ 19,662

	As of December 31, 2023			
	Level 1	Level 2	Level 3	Total
Assets:				
Money market accounts	$ 658,574	$ —	$ —	$ 658,574
Liabilities:				
Current contingent consideration	$ —	$ —	$ 12,983	$ 12,983
Noncurrent contingent consideration	$ —	$ —	$ 14,070	$ 14,070

Contingent Consideration – Earnout

As of December 31, 2024, the maximum amount of future contingent consideration (undiscounted) that the Company could be required to pay in connection with each of the completed acquisitions is; $54.5 million over a three-year period for Tantti, which was acquired December 2024, $13.8 million for Avitide, and $3.3 million for FlexBiosys. The Avitide and FlexBiosys earnout periods ended on December 31, 2024, therefore the maximum contingent consideration reflects the earnout achievement to be paid in the first quarter of 2025. The fair value level of the contingent consideration related to Avitide and FlexBiosys was transferred from Level 3 to Level 2 in the fourth quarter of 2024. See Note 5, "*Acquisitions*" to this report for more information on the contingent consideration earnouts.

During 2024, changes to expected results and changes in market inputs used to calculate the discount rate resulted in an increase in amounts reported as of December 31, 2024. A reconciliation of the change in fair value of contingent consideration – earnout is included in the following table (amounts in thousands):

Balance at December 31, 2023	$	27,053
Acquisition date fair value of contingent consideration earnouts		19,738
Payment of contingent consideration earnouts		(13,117)
Increase in fair value of contingent consideration earnouts		3,190
Translation adjustment		(76)
Balance at December 31, 2024	$	36,788

The recurring Level 3 fair value measurement of our contingent consideration – earnout that we expect to be required to settle our contingent consideration obligation for Tantti include the following significant unobservable inputs (amounts in thousands, except percent data):

Contingent Consideration Earnout	Fair Value as of December 31, 2024	Valuation Technique	Unobservable Input	Range	Weighted Average[1]
Commercialization-based payments	$ 3,854	Monte Carlo Simulation	Probability of Success	0% - 100%	50%
			Earnout Discount Rate	5.4%	5.4%
Revenue and Volume-based payments	$ 13,268	Monte Carlo Simulation	Volatility	22.6% - 34.7%	34.7%
			Revenue & Volume Discount Rate	10.2% - 15.7%	15.7%
			Earnout Discount Rate	5.4% - 5.8%	5.4%
Manufacturing line expansions	$ 2,540	Probability-weighted present value	Probability of Success	0% - 100%	50%
			Earnout Discount Rate	5.4% - 5.5%	5.4%

(1) Unobservable inputs were weighted by the relative fair value of the contingent consideration liability.

The Company estimates the fair value of the Level 3 contingent consideration earnouts using a Monte Carlo simulation. Changes in the projected performance of the acquired business could result in a higher or lower contingent consideration obligation in the future.

Fair Value Measured on a Nonrecurring Basis

During 2024, there were no re-measurements to fair value of financial assets and liabilities that are measured at fair value on a nonrecurring basis.

Convertible Senior Notes

In July 2019, the Company issued $287.5 million aggregate principal amount of the 2019 Notes, which matured and were paid in July 2024. At December 31, 2023, the carrying value of the 2019 Notes was $69.5 million, net of unamortized debt issuance costs and the fair value of

the 2019 Notes was $109.8 million using a Level 1 valuation and determined based on the most recent trade activity of the 2019 Notes as of December 31, 2023.

On December 14, 2023, the Company issued $600.0 million aggregate principal amount of its 2023 Notes in a private placement pursuant to separate, privately negotiated exchange and subscription agreements (the "Exchange and Subscription Agreements") with a limited number of holders of its outstanding 2019 Notes and certain other qualified institutional buyers pursuant to Rule 144A under the Securities Act of 1933, as amended ("Securities Act"). Pursuant to the Exchange and Subscription Agreements, the Company exchanged $217.7 million of its 2019 Notes for $309.9 million aggregate principal amount of the 2023 Notes (the "Exchange Transaction") and issued $290.1 million aggregate principal amount of the 2023 Notes (the "Subscription Transactions") for $290.1 million in cash. At December 31, 2024 and 2023, the carrying value of the 2023 Notes was $525.6 million and $510.1 million, net of unamortized debt issuance costs, and the fair value of the 2023 Notes was $546.1 million and $596.0 million, respectively. The fair value of the 2023 Notes is a Level 1 valuation and was determined based on the most recent trade activity of the 2023 Notes as of December 31, 2024 and 2023. The 2023 Notes are discussed in more detail in Note 15, "*Convertible Senior Notes,*" to these consolidated financial statements.

4. Derivative Instruments

The primary risk managed by the Company using derivative instruments is foreign exchange risk. Foreign exchange forward contracts are entered into as hedges against unfavorable fluctuations in the U.S. dollar to Swedish krona (SEK) exchange rates. The Company does not apply hedge accounting to these contracts because these are not qualified as accounting hedges; therefore the changes in fair value are recorded in the consolidated statements of operations and comprehensive income (loss). By using derivative instruments to mitigate exposures to changes in foreign exchange rates, the Company is exposed to credit risk from the failure of the counterparty to perform under the terms of the contract. The credit or repayment risk is minimized by entering into transactions with high-quality counterparties.

The notional amounts of the outstanding contracts at December 31, 2024 were as follows (in thousands):

	U.S. Dollar Amount	SEK Amount
May 2025	26,481	289,967
September 2025	62,550	679,418
	89,031	969,385

The fair value of outstanding derivative instruments recorded in the accompanying consolidated balance sheet were as follows (in thousands):

(in thousands)		December 31, 2024
Derivatives not designated or not qualifying as hedging instruments	**Balance Sheet Location**	
Foreign exchange forward contracts	Other current assets	$ 287

The effects of derivative instruments on the consolidated statements of operations and comprehensive income (loss) were as follows (in thousands):

Amount of Gain Recognized on Derivatives		Year Ended December 31, 2024
Derivatives not designated or not qualifying as hedging instruments	**Location of loss recognized on derivatives**	
Foreign exchange forward contracts	Other income (expense)	$ 287

5. Acquisitions

2024 Acquisitions

Tantti Laboratory Inc.

On December 2, 2024, the Company's subsidiary, Repligen Sweden AB acquired Tantti Laboratory Inc. ("Tantti") from the former shareholders of Tantti ("Tantti Seller") pursuant to a share swap agreement, dated as of July 27, 2024 (such acquisition, the "Tantti Acquisition"), by and among Repligen Sweden AB, the Tantti Seller, and the Company, in its capacity as guarantor of the obligations of Repligen Sweden AB under the Share Purchase Agreement.

Tantti, headquartered in Taoyuan City, Taiwan, has developed a unique portfolio of macroporous chromatography beads to optimize the purification of new modalities including viral vectors, viruses, nucleic acids and other large molecule biologics. The addition of Tantti further strengthens our portfolio in the new modality space.

Consideration Transferred

The Company accounted for the Tantti Acquisition as a purchase of business under ASC 805, "Business Combinations," and the Company engaged a third-party valuation firm to assist with the valuation of Tantti. Under the share swap agreement, all outstanding equity interests of Tantti were acquired for consideration with a value totaling $74.8 million. The Tantti Acquisition was funded through payment of $55.1 million in cash and contingent consideration with a fair value of $19.7 million. Under the acquisition method of accounting, the assets acquired and liabilities assumed of Tantti were recorded as of the acquisition date, at their respective fair values, and consolidated with those of the Company. The fair value of the net liabilities acquired is estimated to be ($1.2) million, the fair value of the intangible assets acquired is estimated to be $28.9 million and the residual goodwill is estimated to be $47.1 million. Acquisition-related costs are not included as a component of consideration transferred but are expensed in the periods in which costs are incurred. The Company has incurred $1.6 million of transaction and integration costs associated with the Tantti Acquisition from the date of acquisition to December 31, 2024. The transaction costs are included in operating expenses in the consolidated statements of comprehensive income in 2024.

Fair Value of Net Assets Acquired

The preliminary allocation of purchase price is based on the fair value of assets acquired and liabilities assumed as of the acquisition date. As of December 31, 2024, the purchase accounting for this acquisition had not been finalized. As additional information becomes available, including the outcome of the obsolescence study on developed technology, the Company may further revise its preliminary purchase price allocation during the remainder of the measurement period. Besides the outcome of the obsolescence study and the tax implications of the purchase price allocation, the final allocation may also result in changes to other assets and liabilities. The components and estimated allocation of the purchase price consist of the following (amounts in thousands):

Cash and cash equivalents	$	85
Accounts receivable		1
Inventory		41
Prepaid expenses and other current assets		321
Property and equipment		731
Operating lease right of use asset		637
Other assets, long-term		81
Developed technology		28,910
Goodwill		47,105
Accounts payable		(18)
Accrued liabilities		(510)
Operating lease liability		(214)
Noncurrent deferred tax liability		(1,911)
Noncurrent operating lease liability		(413)
Fair value of net assets acquired	$	74,846

Acquired Goodwill

The goodwill of $47.1 million represents future economic benefits expected to arise from anticipated synergies from the integration of Tantti into the Company. These synergies include operating efficiencies and strategic benefits projected to be achieved as a result of the Tantti Acquisition. Substantially all of the goodwill recorded is expected to be nondeductible for income tax purposes.

Intangible Assets

The identified intangible asset associated with the Tantti Acquisition is Developed Technology of $28.9 million with a useful life of fifteen years.

2023 Acquisitions

Metenova Holding AB

On October 2, 2023, the Company's subsidiary, Repligen Sweden AB acquired Metenova from the former shareholders of Metenova (the "Metenova Seller") pursuant to a Share Sale and Purchase Agreement (the "Share Purchase Agreement"), dated as of September 23, 2023 (such acquisition, the "Metenova Acquisition"), by and among Repligen Sweden AB, the Metenova Seller, and the Company, in its capacity as guarantor of the obligations of Repligen Sweden AB under the Share Purchase Agreement.

Metenova, which is headquartered in Molndal, Sweden, offers magnetic mixing and drive train technologies that are widely used by global biopharmaceutical companies and contract development and manufacturing organizations. The Metenova Acquisition further strengthens our fluid management portfolio with these products.

Consideration Transferred

The Company accounted for the Metenova Acquisition as a purchase of business under ASC 805, "*Business Combinations,*" and the Company engaged a third-party valuation firm to assist with the valuation of Metenova. Under the Share Purchase Agreement, all outstanding equity interests of Metenova were acquired for consideration with a value totaling $172.6 million. The Metenova Acquisition was funded through payment of $164.5 million in cash, the issuance of 52,299 unregistered shares of the Company's common stock totaling $8.1 million and contingent consideration with an immaterial fair value.

Under the acquisition method of accounting, the assets acquired and liabilities assumed of Metenova were recorded as of the acquisition date, at their respective fair values, and consolidated with those of the Company. The fair value of the net liabilities acquired is $1.9 million, the fair value of the intangible assets acquired is $58.8 million and the residual goodwill is $115.7 million. Acquisition-related costs are not included as a component of consideration transferred but are expensed in the periods in which costs are incurred. The Company has incurred $6.5 million of transaction and integration costs associated with the Metenova Acquisition from the date of acquisition to December 31, 2024. The transaction costs are included in operating expenses in the condensed consolidated statements of comprehensive income (loss) for the periods ended December 31, 2024 and 2023.

Fair Value of Net Assets Acquired

The allocation of purchase price is based on the fair value of assets acquired and liabilities assumed based on the final valuation of Metenova. The Company has made appropriate adjustments to the purchase price allocation during the measurement period, which ended on October 2, 2024.

The components and estimated allocation of the purchase price consist of the following (amounts in thousands):

Cash and cash equivalents	$	5,768
Accounts receivable		3,730
Inventory		4,477
Prepaid expenses and other current assets		470
Property and equipment		433
Operating lease right of use asset		615
Customer relationships		12,659
Developed technology		44,377
Trademark and tradename		939
Non-competition agreements		787
Goodwill		115,722
Accounts payable		(1,432)
Accrued liabilities		(2,934)
Operating lease liability		(275)
Noncurrent deferred tax liability		(12,481)
Noncurrent operating lease liability		(255)
Fair value of net assets acquired	$	172,600

Acquired Goodwill

The goodwill of $115.7 million represents future economic benefits expected to arise from anticipated synergies from the integration of Metenova into the Company. These synergies include operating efficiencies and strategic benefits projected to be achieved as a result of the Metenova Acquisition. Substantially all of the goodwill recorded is expected to be nondeductible for income tax purposes.

Intangible Assets

The following table sets forth the components of the identified intangible assets associated with the Metenova Acquisition and their estimated useful lives:

	Useful life	**Fair Value**	
		(Amounts in thousands)	
Customer relationships	15 years	$	12,659
Developed technology	15 years		44,377
Trademark and tradename	15 years		939
Non-competition agreements	2 years		787
		$	58,762

FlexBiosys, Inc.

On April 17, 2023, the Company completed its acquisition of all of the outstanding equity interests in FlexBiosys, pursuant to an Equity Purchase Agreement with FlexBiosys, TSAP Holdings Inc. ("NJ Seller"), Gayle Tarry and Stanley Tarry, as individuals (collectively with NJ Seller, the "FlexBiosys Sellers"), and Stanley Tarry, in his capacity as the representative of the FlexBiosys Sellers (the "FlexBiosys Acquisition").

FlexBiosys, which is headquartered in Branchburg, New Jersey, offers expert design and custom manufacturing of single-use bioprocessing products and a comprehensive range of products that include bioprocessing bags, bottles, and tubing assemblies. These products will complement and expand our fluid management portfolio of offerings.

Consideration transferred

The FlexBiosys Acquisition was accounted for as a purchase of a business under ASC 805, "*Business Combinations,*" and the Company engaged a third-party valuation firm to assist with the valuation of FlexBiosys. Under the terms of the EPA, all outstanding equity interests of FlexBiosys were acquired for consideration with a value totaling $41.0 million. The FlexBiosys Acquisition was funded through payment of $29.0 million in cash, which includes $6.3 million deposited in escrow for future payments, the issuance of 31,415 unregistered shares of the Company's common stock totaling $5.4 million and contingent consideration with fair value of approximately $6.6 million.

Under the acquisition method of accounting, the assets acquired and liabilities assumed of FlexBiosys were recorded as of the acquisition date, at their respective fair values, and consolidated with those of the Company. The fair value of the net assets acquired is $14.1 million, the fair value of the intangible assets acquired is $12.6 million and the residual goodwill is $14.3 million. Acquisition-related costs are not

included as a component of consideration transferred but are expensed in the periods in which costs are incurred. The Company has incurred $0.9 million of transaction and integration costs associated with the FlexBiosys Acquisition from the date of acquisition to December 31, 2024. The transaction costs are included in operating expenses in the condensed consolidated statements of comprehensive income (loss) for the periods ended December 31, 2024 and 2023.

Fair Value of Net Assets Acquired

The allocation of purchase price is based on the fair value of assets acquired and liabilities assumed as of the acquisition date, based on the final valuation of FlexBiosys. The Company has made appropriate adjustments to the purchase price allocation during the measurement period, which ended on April 17, 2024. The purchase price allocation was completed as of March 31, 2024.

The components and estimated allocation of the purchase price consist of the following (amounts in thousands):

Cash and cash equivalents	$	1,090
Accounts receivable		683
Inventory		667
Prepaid expenses and other current assets		35
Property and equipment		12,034
Operating lease right of use asset		3,537
Customer relationships		2,530
Developed technology		9,860
Trademark and tradename		30
Non-competition agreements		220
Goodwill		14,321
Other noncurrent assets		10
Accounts payable		(136)
Accrued liabilities		(314)
Operating lease liability		(39)
Noncurrent operating lease liability		(3,498)
Fair value of net assets acquired	$	41,030

During 2023, the Company recorded an immaterial net working capital adjustment related to the FlexBiosys Acquisition, which is included in goodwill in the table above.

Acquired Goodwill

The goodwill of $14.3 million represents future economic benefits expected to arise from anticipated synergies from the integration of FlexBiosys into the Company. These synergies include operating efficiencies and strategic benefits projected to be achieved as a result of the FlexBiosys Acquisition. Substantially all of the goodwill recorded is expected to be deductible for income tax purposes.

Intangible Assets

The following table sets forth the components of the identified intangible assets associated with the FlexBiosys Acquisition and their estimated useful lives:

	Useful life		**Fair Value (Amounts in thousands)**
Customer relationships	12 years	$	2,530
Developed technology	16 years		9,860
Trademark and tradename	4 years		30
Non-competition agreements	5 years		220
		$	12,640

6. Restructuring Activities and Other Inventory-Related Charges

In July 2023, the Board of Directors authorized the Company's management team to undertake restructuring activities to simplify and streamline our organization and strengthen the overall effectiveness of our operations. Since the initial streamlining and rebalancing efforts contemplated in July 2023, and with the introduction of new management in the second half of 2024, the Company continues to undertake

further restructuring activities (collectively, the "Restructuring Plan") which has included consolidating a portion of our manufacturing operations between certain U.S. locations, writing-off abandoned equipment with the rationalization of excess production line capacity and discontinuing the sale of certain product SKUs. In addition, the Company continues to evaluate the net realizable value of finished goods and raw materials to meet rapidly changing demand during a challenging supply chain environment in the industry.

The Company recorded pre-tax costs of $46.9 million and $32.2 million in the years ended December 31, 2024 and 2023, respectively, related to the Restructuring Plan and other inventory-related charges. The Company believes the Restructuring Plan is now primarily complete as of December 31, 2024.

The following table summarizes the charges related to restructuring activities and other inventory-related charges by type of cost:

	For the Year Ended December 31, 2024				
	Severance and Employee-Related Costs	Inventory Write-Off	Accelerated Depreciation	Facility and Other Exit Costs	Total
	(Amounts in thousands)				
Cost of goods sold	$ 876	$ 36,082	$ 19	$ 7,051	$ 44,028
Research and development	449	—	—	—	449
Selling, general and administrative	1,604	—	—	1,088	2,692
Other (expenses) income	—	—	—	(234)	(234)
	$ 2,929	$ 36,082	$ 19	$ 7,905	$ 46,935

	For the Year Ended December 31, 2023				
	Severance & Employee-Related Costs	Inventory Adjustments	Accelerated Depreciation	Facility and Other Exit Costs	Total
	(Amounts in thousands)				
Cost of goods sold	$ 2,077	$ 23,588	$ 3,788	$ 933	$ 30,386
Research and development	116	—	—	—	116
Selling, general and administrative	1,532	—	28	138	1,698
	$ 3,725	$ 23,588	$ 3,816	$ 1,071	$ 32,200

Severance and employee-related costs are primarily associated with headcount reductions. Costs incurred include cash severance and non-cash severance, including other termination benefits. Severance and other termination benefit packages are based on established benefit arrangements or local statutory requirements and we recognized the contractual component of these benefits when payment was probable and could be reasonably estimated.

Non-cash charges for the inventory write-off in 2023 included the impact of the Company discontinuing the sale of certain product SKUs, the impact of having proactively secured materials during the 2020-2022 pandemic period to meet accelerated demand during a challenging supply chain environment in the industry, and the impact of closing manufacturing facilities and production lines which include inventory that could not be repurposed. Where demand has reduced, finished goods and raw materials, the value of which exceeded the projected requirements to be used before reaching their expiration date, were written off.

The non-cash inventory write-off in 2024 includes the impact of the Company discontinuing the sale of certain product SKUs and is also the result of the further evaluation of inventory positions in unusually turbulent market supply conditions. This further evaluation took into consideration the market reset that continued into 2024 and resulted in new senior product management leadership updating product strategies. With these updated strategies, future demand and product mix projections were revised as a part of the Company's annual strategic planning and budget sessions in 2024. Where the value of finished goods and raw materials exceeded the projected requirements to be used before reaching their expiration date, or in a reasonable time horizon, they were written off.

In the fourth quarter of 2024, non-cash charges were recognized for the write-off of abandoned equipment in connection with unneeded capacity related to a specific product line that was also included in the 2024 inventory adjustment. The Company's manufacturing strategy and footprint were also reviewed as a part of our 2024 annual strategic planning and budget session. For this product line,

capacity was expanded during the pandemic period, and current projections indicate it will not be needed in a usable time-period. The factory space will be reallocated for the production of other product lines.

7. Leases

The Company is a lessee under leases of manufacturing facilities, office spaces, machinery, certain office equipment and vehicles. A majority of the Company's leases are operating leases with remaining lease terms between one month and 12 years. Finance leases are immaterial to the Company's consolidated financial statements. The Company determines if an arrangement qualifies as a lease and what type of lease it is at inception. The Company elected the package of practical expedients permitted under the transition guidance within the new lease standard, which among other things, allowed it to continue to account for existing leases based on the historical lease classification. The Company also elected the practical expedients to combine lease and non-lease components and to exclude right of use assets and lease liabilities for leases with an initial term of 12 months or less from the balance sheet.

Some of the lease agreements the Company enters into include Company options to either extend and/or early terminate the lease, the costs of which are included in the Company's operating lease liabilities to the extent that such options are reasonably certain of being exercised. Leases with renewal options allow the Company to extend the lease term typically between 1 and 5 years per option, some of its leases have multiple options to extend. When determining if a renewal option is reasonably certain of being exercised, the Company considers several economic factors, including but not limited to, the significance of leasehold improvements incurred on the property, whether the asset is difficult to replace, underlying contractual obligations, or specific characteristics unique to that particular lease that would make it reasonably certain that the Company would exercise such options.

As of December 31, 2024 and 2023, operating lease right of use assets were $135.4 million and $115.5 million, respectively and operating lease liabilities were $160.7 million and $132.2 million, respectively. The addition of the Shrewsbury, Massachusetts lease and renewal of the Rancho Dominguez, California lease were the primary contributors to the change in the asset and liability balances. The Shrewsbury lease consists of 139,000 square foot of primarily warehouse space was added to the balance sheet on February 1, 2024 and has a future asset value of $13.7 million. The Rancho Dominguez lease consists of 72,000 square foot of primarily warehouse space added to the balance sheet on December 1, 2024 and has a future asset value of $13.0 million.

The maturities of the Company's operating lease liabilities as of December 31, 2024 are as follows (amounts in thousands):

As of December 31, 2024	Amount
2025	$ 24,530
2026	27,292
2027	25,854
2028	26,054
2029	25,928
2030 and thereafter	65,869
Total future minimum lease payments	195,527
Less lease incentives	(2,790)
Less amount of lease payment representing interest	(32,057)
Total operating lease liabilities	$ 160,680

Total operating lease liabilities included on the Company's consolidated balance sheets are as follows (amounts in thousands):

	December 31,	
	2024	2023
Operating lease liability	$ 15,104	$ 5,631
Operating lease liability, long-term	145,576	126,578
Minimum operating lease payments	$ 160,680	$ 132,209

Lease expense for these leases is recognized on a straight-line basis over the lease term, with variable lease payments recognized in the period those payments are incurred. For the years ended December 31, 2024, 2023 and 2022, total lease cost is comprised of the following:

	For the Years Ended December 31,		
Lease Cost	**2024**	**2023**	**2022**
	(Amounts in thousands)		
Operating lease cost	$ 24,234	$ 20,981	$ 17,833
Variable operating lease cost	4,482	4,075	11,317
Lease cost	$ 28,716	$ 25,056	$ 29,150

The following information represents supplemental disclosure for the consolidated statements of cash flows related to operating leases (amounts in thousands):

	For the Years Ended December 31,		
	2024	**2023**	**2022**
Operating lease cost	$ (23,806)	$ (17,862)	$ (13,757)

Most of the leases do not provide implicit interest rates and therefore the Company determines the discount rate based on its incremental borrowing rate. The incremental borrowing rate for the Company's leases is determined based on lease term and currency in which the lease payments are made.

The weighted average remaining lease term and the weighted average discount rate used to measure the Company's operating lease liabilities as of December 31, 2024, were:

Weighted average remaining lease term (years)	7.53
Weighted average discount rate	4.56%

8. Revenue Recognition

The Company generates revenue from the sale of bioprocessing products, equipment devices, and related consumables used with these equipment devices to customers in the life science and biopharmaceutical industries. Under ASC 606, *"Revenue from Contracts with Customers,"* revenue is recognized when, or as, obligations under the terms of a contract are satisfied, which occurs when control of the promised products or services is transferred to customers.

Disaggregation of Revenue

Revenue for the years ended December 31, 2024, 2023 and 2022 was as follows:

	For the Years Ended December 31,		
	2024	**2023**	**2022**
	(Amounts in thousands)		
Product revenue	$ 634,178	$ 631,979	$ 801,183
Royalty and other income	261	383	353
Total revenue	$ 634,439	$ 632,362	$ 801,536

When disaggregating revenue, the Company considered all of the economic factors that may affect its revenues. Because its revenues are from bioprocessing customers, there are no differences in the nature, timing and uncertainty of the Company's revenues and cash flows from any of its product lines. However, given that the Company's revenues are generated in different geographic regions, factors such as regulatory and geopolitical factors within those regions could impact the nature, timing and uncertainty of the Company's revenues and cash flows.

Disaggregated revenue from contracts with customers by geographic region can be found in Note 2, *"Summary of Significant Accounting Policies – Segment Reporting,"* above.

There was no revenue from customers that represented 10% or more of the Company's total revenue for the years ended December 31, 2024, 2023 or 2022.

Filtration Products

The Company's filtration products generate revenue through the sale of KrosFlo and ARTeSYN tangential flow filtration ("TFF") systems, TangenX® flat sheet ("FS") cassettes, Spectrum® HF filters, membranes and modules, XCell ATF systems and related consumables. Supporting our systems, we also sell ProConnex® Flow Path assemblies and custom silicone-based, single-use flow path assemblies and components from Metenova, FlexBiosys, BioFlex, Polymem, ARTeSYN Biosolutions Holdings Ireland Limited, NMS and EMT, seven acquisitions completed since 2020.

The Company's KrosFlo and ARTeSYN systems are used in the filtration, isolation, purification and concentration of biologics and diagnostic products. TFF is a rapid and efficient method for separation and purification of biomolecules that is widely used in laboratory, process development and process scale applications in biopharmaceutical manufacturing. Sales of large-scale systems generally include components and consumables as well as training and installation services at the request of the customer. Because the initial sale of components and consumables is necessary for the operation of the system, such items are combined with the systems as a single performance obligation. Training and installation services do not significantly modify or customize these systems and therefore represent a distinct performance obligation.

The Company's TangenX FS cassettes (SIUS, SIUS Gamma® and PRO) are not highly interdependent on one another and are therefore considered distinct products that represent separate performance obligations. Product revenue from the sale of TangenX FS cassettes is generally recognized at a point in time upon transfer of control of the customer.

The Company's other filtration product offerings are not highly interdependent of one another and are therefore considered distinct products that represent separate performance obligations. Revenue on these products is generally recognized at a point in time upon transfer of control to the customer. The Company invoices the customer for the installation and training services in an amount that directly corresponds with the value to the customer of the Company's performance to date; therefore, revenue recognized is based on the amount billable to the customer in accordance with the practical expedient under ASC 606-10-55-18.

The Company also markets XCell ATF controllers, which are technologically advanced filtration devices used in upstream processes to continuously remove cellular metabolic waste products during the course of a fermentation run, freeing healthy cells to continue producing the biologic drug of interest. XCell ATF controllers are typically sold with consumables (i.e., tubing sets, metal stands) as well as training and installation services at the request of the customer. The controllers and consumables are considered distinct products and therefore represent separate performance obligations. First time purchasers of the controllers typically purchase a controller that is shipped with the tubing set(s) and metal stand(s). The training and installation services do not significantly modify or customize the XCell ATF controllers and therefore represent a distinct performance obligation. XCell ATF product revenue related to controllers and consumables is generally recognized at a point in time upon transfer of control to the customer.

Chromatography Products

The Company's chromatography products include a number of products used in the downstream purification and quality control of biological drugs. The majority of chromatography revenue relates to the OPUS pre-packed chromatography column product line. OPUS columns are designed to be disposable following a production campaign. Each OPUS column is delivered pre-packaged with the customer's choice of chromatography resin, which is either provided by the Company for the customer or is customer supplied. Chromatography product revenue is generally recognized at a point in time upon transfer of control to the customer and represents a single performance obligation.

Process Analytics Products

The process analytics franchise generates revenue primarily through the sale of the SoloVPE and FlowVPX slope spectroscopy systems, consumables and service. These products complement and support the Company's existing filtration, chromatography and proteins franchises as they allow end-users to make in-line protein concentration measurements in filtration, chromatography and fill-finish applications, designed to allow for real-time process management. Process analytics product revenue is generally recognized at a point in time upon transfer of control to the customer.

Protein Products

The Company's protein franchise generates revenue primarily through the sale of Protein A affinity ligands and growth factors. Protein A ligands are an essential component of Protein A chromatography resins (media) used in the purification of virtually all mAb-based drugs on the market or in development. The Company manufactures multiple forms of Protein A ligands under long-term supply agreements with major life sciences companies, who in turn sell their Protein A chromatography media to end users (biopharmaceutical manufacturers). The Company also manufactures growth factors for sale under long-term supply agreements with certain life sciences companies as well as for direct sales to its customers. Each protein product is considered distinct and therefore represents a separate performance obligation. Protein product revenue is generally recognized at a point in time upon transfer of control to the customer.

In 2021, the Company completed the Avitide Acquisition and added its multiple libraries and leading technology in affinity ligand discovery and development to its proteins franchise. The acquisition gives the Company a new platform for affinity resin development, including C&GT, and advances and expands the Company's proteins and chromatography franchises to address the unique purification needs of gene therapies and other emerging modalities. With our acquisition of Tantti on December 2, 2024, we expect to accelerate our expansion into new modality markets with unique, scalable purification solutions for these larger molecule biologics.

Other Products

The Company's other products include operating room products sold to hospitals. Other product revenue is generally recognized at a point in time upon transfer of control to the customer.

Transaction Price Allocated to Future Performance Obligations

Remaining performance obligations represent the transaction price of contracts for which work has not been performed or has been partially performed. The Company's future performance obligations relate primarily to the installation and training of certain of its systems sold to customers. These performance obligations are completed within one year of receipt of a purchase order from its customers. Accordingly, the Company has elected to not disclose the value of these unsatisfied performance obligations as provided under ASC 606-10-50-14.

Contract Balances from Contracts with Customers

The following table provides information about receivables and deferred revenue from contracts with customers as of December 31, 2024 (amounts in thousands):

	December 31, 2024	December 31, 2023
Balances from contracts with customers only:		
Accounts receivable	$ 134,115	$ 124,161
Deferred revenue (included in accrued liabilities and other noncurrent liabilities in the condensed consolidated balance sheets)	$ 13,597	$ 17,536
Revenue recognized during periods presented relating to:		
The beginning deferred revenue balance	$ 16,372	$ 18,751

The timing of revenue recognition, billings and cash collections results in the accounts receivable and deferred revenue balances on the Company's consolidated balance sheets.

A contract asset is created when the Company satisfies a performance obligation by transferring a promised good to the customer. Contract assets may represent conditional or unconditional rights to consideration. The right is conditional and recorded as a contract asset if the Company must first satisfy another performance obligation in the contract before it is entitled to payment from the customer. Contract assets are transferred to billed receivables once the right becomes unconditional. If the Company has the unconditional right to receive consideration from the customer, the contract asset is accounted for as a billed receivable and presented separately from other contract assets. A right is unconditional if nothing other than the passage of time is required before payment of that consideration is due.

When consideration is received, or such consideration is unconditionally due, from a customer prior to transferring goods or services to the customer under the terms of a contract, a contract liability is recorded. Contract liabilities are recognized as revenue after control of the products or services is transferred to the customer and all revenue recognition criteria have been met.

Costs to Obtain or Fulfill a Customer Contract

The Company's sales commission structure is based on achieving revenue targets. The commissions are driven by revenue derived from customer purchase orders which are short term in nature.

Applying the practical expedient in paragraph 340-40-25-4, the Company recognizes the incremental costs of obtaining contracts as an expense when incurred if the amortization period of the assets that the Company otherwise would have recognized is one year or less. These costs are included in selling, general, and administrative expenses in our consolidated statements of comprehensive income. When shipping and handling costs are incurred after a customer obtains control of the products, the Company accounts for these as costs to fulfill the promise and not as a separate performance obligation.

9. Credit Losses

The Company is exposed to credit losses primarily through sales of products and services. The Company's expected loss allowance methodology for accounts receivable is developed using historical collection experience, current and future economic and market conditions and a review of the current status of customers' trade accounts receivable. Customers are pooled based on sharing specific risk factors, including geographic location. Due to the short-term nature of such receivables, the estimated accounts receivable that may not be collected is based on aging of the accounts receivable balances.

Customers are assessed for credit worthiness upfront through a credit review, which includes assessment based on the Company's analysis of their financial statements when a credit rating is not available. The Company evaluates contract terms and conditions, country and political risk, and may require prepayment to mitigate risk of loss. Specific allowance amounts are established to record the appropriate provision for customers that have a higher probability of default. The Company monitors changes to the receivables balance on a timely basis, and balances are written off as they are determined to be uncollectible after all collection efforts have been exhausted. Estimates of potential credit losses are used to determine the allowance. It is based on assessment of anticipated payment and all other historical, current and future information that is reasonably available.

The accounts receivable balance on the Company's consolidated balance sheets as of December 31, 2024 was $134.1 million, net of $1.8 million of allowances. The following table provides a roll-forward of the allowance for credit losses in 2024 and 2023 that is deducted from the amortized cost basis of accounts receivable to present the net amount expected to be collected (amounts in thousands):

	For the Years Ended December 31,	
	2024	2023
Balance of allowance for credit losses, beginning of period	$ (2,122)	$ (1,365)
Current period change for write-offs	135	82
Current period change for expected credit losses	155	(839)
Balance of allowance for credit losses, end of period	$ (1,832)	$ (2,122)

10. Goodwill and Intangible Assets

Goodwill

Goodwill represents the difference between the purchase price and the estimated fair value of identifiable assets acquired and liabilities assumed. Goodwill acquired in a business combination and determined to have an indefinite useful life is not amortized, but instead is

tested for impairment at least annually in accordance with ASC 350. The following table represents the changes in the carrying value of goodwill for the years ended December 31, 2024 and 2023 (amounts in thousands):

Balance as of December 31, 2022	$	855,513
Acquisition of FlexBiosys, Inc.		14,321
Acquisition of Metenova Holding AB		115,778
Cumulative translation adjustment		1,508
Balance as of December 31, 2023	$	987,120
Measurement period adjustment - Metenova	$	(56)
Acquisition of Tantti Laboratory Inc.		47,105
Cumulative translation adjustment		(3,174)
Balance as of December 31, 2024	$	1,030,995

During each of the fourth quarters of 2024, 2023 and 2022, the Company completed its annual impairment assessments and concluded that goodwill was not impaired in any of those years.

Intangible Assets

Intangible assets with a definitive life are amortized over their useful lives using the straight-line method, and the amortization expense is recorded within cost of goods sold, research and development, and selling, general and administrative expense in the Company's consolidated statements of comprehensive income. Intangible assets and their related useful lives are reviewed at least annually to determine if any adverse conditions existed that would indicate the carrying value of these assets may not be recoverable. More frequent impairment assessments are conducted if certain conditions exist, including a change in the competitive landscape, any internal decisions to pursue new or different technology strategies, a loss of a significant customer, or a significant change in the marketplace, including changes in the prices paid for the Company's products or changes in the size of the market for the Company's products. If impairment indicators are present, the Company determines whether the underlying intangible asset is recoverable through estimated future undiscounted cash flows. If the asset is not found to be recoverable, it is written down to the estimated fair value of the asset based on the sum of the future discounted cash flows expected to result from the use and disposition of the asset. If the estimate of an intangible asset's remaining useful life is changed, the remaining carrying amount of the intangible asset is amortized prospectively over the revised remaining useful life. The Company continues to believe that its definite-lived intangible assets are recoverable at December 31, 2024.

Indefinite-lived intangible assets are tested for impairment at least annually. There has been no impairment of our intangible assets for the periods presented.

Intangible assets, net consisted of the following at December 31, 2024:

	December 31, 2024			
	Gross Carrying Value	Accumulated Amortization	Net Carrying Value	Weighted Average Useful Life (in years)
	(Amounts in thousands)			
Finite-lived intangible assets:				
Technology – developed	$ 283,380	$ (60,272)	$ 223,108	16
Patents	240	(240)	—	8
Customer relationships	267,599	(100,646)	166,953	15
Trademarks	8,641	(2,283)	6,358	19
Other intangibles	3,812	(3,034)	778	3
Total finite-lived intangible assets	563,672	(166,475)	397,197	15
Indefinite-lived intangible asset:				
Trademarks	700	—	700	—
Total intangible assets	$ 564,372	$ (166,475)	$ 397,897	

Intangible assets consisted of the following at December 31, 2023:

	December 31, 2023			
	Gross Carrying Value	Accumulated Amortization	Net Carrying Value	Weighted Average Useful Life (in years)
	(Amounts in thousands)			
Finite-lived intangible assets:				
Technology – developed	$ 256,536	$ (44,633)	$ 211,903	16
Patents	240	(240)	—	8
Customer relationships	269,949	(83,963)	185,986	15
Trademarks	8,757	(1,789)	6,968	19
Other intangibles	3,914	(2,514)	1,400	3
Total finite-lived intangible assets	539,396	(133,139)	406,257	15
Indefinite-lived intangible asset:				
Trademarks	700	—	700	—
Total intangible assets	$ 540,096	$ (133,139)	$ 406,957	

Amortization expense for finite-lived intangible assets was $34.7 million, $31.6 million and $27.1 million for the years ended December 31, 2024, 2023 and 2022, respectively. As of December 31, 2024, the Company expects to record the following amortization expense (amounts in thousands):

For the Years Ended December 31,	Estimated Amortization Expense
2025	$ 36,015
2026	35,649
2027	35,616
2028	35,520
2029	34,771
2030 and thereafter	219,626
Total	$ 397,197

11. Consolidated Balance Sheet Detail

Inventories, net

Inventories, net consists of the following:

	December 31,	
	2024	2023
	(Amounts in thousands)	
Raw materials	$ 82,208	$ 123,598
Work-in-process	4,542	4,492
Finished products	56,214	74,231
Total inventories, net	$ 142,964	$ 202,321

Assets Held for Sale

During the first quarter of 2024, the Company's management decided it would explore a sale of the Company's property located at 119 Fredon Springdale Road, Fredon, New Jersey (the "BioFlex Property") and engaged a broker to assist with the sale process. As a result of these actions, the Company determined that the sale of the BioFlex Property met the criteria to be classified as assets held-for-sale pursuant to ASC 360, *"Impairment and Disposal of Long-Lived Assets"* beginning in the first quarter of 2024. The sale of the BioFlex Property closed on August 2, 2024 and the Company recorded a gain of $0.2 million on the sale of the BioFlex Property to its condensed consolidated statement of comprehensive income (loss) for the year ended December 31, 2024.

Prepaid Expenses and Other Current Assets

Prepaid expenses and other current assets consist of the following:

	December 31,	
	2024	2023
	(Amounts in thousands)	
Equipment maintenance and services	$ 8,469	$ 6,605
Prepaid income taxes	10,031	10,532
Prepaid insurance	979	3,087
Other	12,128	13,317
Total prepaid expenses and other current assets	$ 31,607	$ 33,541

Property, Plant and Equipment

Property, plant and equipment consist of the following:

	December 31,	
	2024	2023
	(Amounts in thousands)	
Land	$ 824	$ 992
Buildings	675	1,667
Leasehold improvements	145,256	126,663
Equipment	130,413	114,606
Furniture, fixtures and office equipment	9,999	9,077
Computer hardware and software	44,323	35,528
Construction in progress	28,211	47,086
Other	504	544
Total property, plant and equipment	360,205	336,163
Less - Accumulated depreciation	(162,467)	(128,723)
Total property, plant and equipment, net	$ 197,738	$ 207,440

Depreciation expense totaled $35.0 million, $37.0 million and $23.9 million in the fiscal years ended December 31, 2024, 2023 and 2022, respectively.

Accrued Liabilities

Accrued liabilities consist of the following:

	December 31,	
	2024	2023
	(Amounts in thousands)	
Employee compensation	$ 32,163	$ 16,660
Deferred revenue	13,243	17,067
Income taxes payable	1,423	6,814
Other	15,594	16,772
Total accrued liabilities	$ 62,423	$ 57,313

12. Income Taxes

The components of income (loss) before income taxes are as follows:

	For the Years Ended December 31,		
	2024	2023	2022
	(Amounts in thousands)		
Domestic	$ (89,321)	$ (24,888)	$ 153,446
Foreign	62,286	81,595	65,694
(Loss) income before income taxes	$ (27,035)	$ 56,707	$ 219,140

The components of the income tax (benefit) provision are as follows:

	For the Years Ended December 31,		
	2024	2023	2022
	(Amounts in thousands)		
Components of the income tax (benefit) provision:			
Current	$ 15,037	$ 19,941	$ 34,800
Deferred	(16,558)	1,170	(1,619)
Total	$ (1,521)	$ 21,111	$ 33,181
Jurisdictional components of the income tax (benefit) provision:			
Federal	$ (13,684)	$ 2,272	$ 17,662
State	(2,059)	(26)	1,381
Foreign	14,222	18,865	14,138
Total	$ (1,521)	$ 21,111	$ 33,181

At December 31, 2024, the Company had federal net operating loss carryforwards of $19.3 million, state net operating loss carryforwards of $11.9 million, and foreign net operating loss carryforwards of $26.0 million. The federal net operating loss carryforwards have unlimited carryforward periods and do not expire. The state net operating loss carryforwards will expire at various dates through 2044. Approximately $4.8 million of the foreign net operating loss carryforwards have unlimited carryforward periods and do not expire, while $21.2 million of the foreign net operating loss carryforwards will expire at various dates through 2034. At December 31, 2024, the Company had federal and state business tax credit carryforwards of $6.6 million available to reduce future federal and state income taxes. The business tax credit carryforwards will expire at various dates through 2044. Net operating loss carryforwards and available tax credits are subject to review and possible adjustment by the Internal Revenue Service, state and foreign jurisdictions and may be limited in the event of certain changes in the ownership interest of significant stockholders.

The components of deferred income taxes are as follows:

	December 31,	
	2024	2023
	(Amounts in thousands)	
Deferred tax assets:		
Stock-based compensation expense	$ 6,809	$ 5,120
Operating leases	36,415	30,727
Capitalized research and development	20,641	17,568
Inventory	15,539	10,131
Net operating loss carryforwards	9,877	7,648
Business tax credit carryforwards	5,172	5,531
Other	11,587	7,063
Total deferred tax assets	106,040	83,788
Less: valuation allowance	(517)	(20)
Net deferred tax assets	105,523	83,768
Deferred tax liabilities:		
Fixed assets	(18,318)	(17,716)
Acquired intangible assets	(63,132)	(58,467)
Operating lease right of use assets	(29,897)	(26,373)
Debt discount	(16,202)	(19,006)
Total deferred tax liabilities	(127,549)	(121,562)
Total net deferred tax liabilities	$ (22,026)	$ (37,794)

The net change in the total valuation allowance for the year ended December 31, 2024 and 2023 was an increase of approximately $497,000 and a increase of approximately $1,000, respectively.

The reconciliation of the federal statutory rate to the effective income tax rate for the years ended December 31, 2024, 2023 and 2022 is as follows:

	For the Years Ended December 31,					
	2024		2023		2022	
	Amount	%	Amount	%	Amount	%
	(Amounts in thousands, except percentages)					
(Loss) income before income taxes	$ (27,035)		$ 56,707		$ 219,140	
Expected tax at statutory rate	(5,677)	21.0%	11,910	21.0%	46,020	21.0%
Adjustments due to:						
Difference between U.S. and foreign tax	1,200	(4.4%)	1,078	1.9%	1,024	0.5%
State income taxes	(1,812)	6.7%	1,224	2.2%	3,509	1.6%
Business tax credits	(1,523)	5.6%	(4,522)	(8.0%)	(5,139)	(2.3%)
Stock-based compensation expense	1,782	(6.6%)	(2,461)	(4.3%)	(5,638)	(2.6%)
U.S. taxation of foreign earnings	422	(1.6%)	539	1.0%	83	0.0%
Foreign-derived intangible income	—	0.0%	—	0.0%	(5,042)	(2.3%)
Executive compensation	2,718	(10.1%)	3,084	5.4%	5,441	2.5%
Contingent consideration	796	(2.9%)	(6,412)	(11.3%)	(6,033)	(2.8%)
Nondeductible transactions cost	330	(1.2%)	604	1.1%	—	0.0%
Loss on extinguishment of debt	—	0.0%	2,634	4.6%	—	0.0%
Debt discount	—	0.0%	16,650	29.4%	—	0.0%
Foreign exchange loss	—	0.0%	(2,288)	(4.0%)	—	0.0%
Change in U.S. and foreign tax rates	494	(1.8%)	—	0.0%	—	0.0%
Uncertain tax (benefit) provisions	(805)	3.0%	165	0.3%	234	0.1%
Change in valuation allowance	106	(0.4%)	—	0.0%	(688)	(0.3%)
Return to provision adjustments	346	(1.3%)	(1,255)	(2.2%)	(498)	(0.2%)
Other	102	(0.4%)	161	0.3%	(92)	(0.0%)
Income tax (benefit) provision	$ (1,521)	5.6%	$ 21,111	37.2%	$ 33,181	15.1%

The Company's tax returns are subject to examination by federal, state and foreign tax authorities. The Company's two major tax jurisdictions are subject to examination for the following periods:

Jurisdiction	Fiscal Years Subject to Examination
United States - federal and state	2020-2024
Sweden	2019-2024

The following is a tabular reconciliation of the total amounts of unrecognized tax benefits:

	2024	2023
	(Amounts in thousands)	
Balance of gross unrecognized tax benefits, beginning of period	$ 3,139	$ 2,996
Gross amounts of increases in unrecognized tax benefits as a result of tax positions taken in the current period	76	178
Gross amounts of changes in unrecognized tax benefits as a result of tax positions taken in the prior period	(20)	53
Gross amounts of decreases due to release	(1,066)	(88)
Balance of gross unrecognized tax benefits, end of period	$ 2,129	$ 3,139

Included in the balance of unrecognized tax benefits as of December 31, 2024, are $2.1 million of tax benefits that, if recognized, would affect the effective tax rate. The Company classifies interest and penalties related to income taxes as components of its income tax (benefit) provision. In 2024, a net expense of approximately $58,000, was recorded to the income tax provision related to interest and penalties while in 2023, a net expense of approximately $15,000 was recorded. The amount of interest and penalties recorded in the accompanying consolidated balance sheets was approximately $125,000 and $67,000 as of December 31, 2024 and 2023, respectively. In the next twelve months, it is reasonably possible the Company will reduce its gross unrecognized tax benefits, excluding interest by up to $1.4 million due to expiring statutes of limitations.

In 2021, the Organization of Economic Co-operation and Development announced an Inclusive Framework on Base Erosion and Profit Sharing with the goal of achieving consensus around substantial changes to international tax policies, including the implementation of a minimum global effective tax rate of 15%. We continue to evaluate the impacts of enacted legislation and pending legislation in the tax jurisdictions in which we operate. While various countries have implemented the legislation as of January 1, 2024, and various countries continue to implement, we do not expect a resulting material change to our income tax provision for the 2025 fiscal year.

As of December 31, 2024, the Company has accumulated undistributed earnings generated by its foreign subsidiaries of approximately $266.2 million. Because $5.7 million of such earnings have previously been subject to the one-time transition tax on foreign earnings required by the Tax Cuts and Jobs Act enacted in December 2017, any additional taxes due with respect to such earnings or the excess of the amount for financial reporting over the tax basis of our foreign investments would generally be limited to foreign and state taxes. At December 31, 2024, the Company has not provided for taxes on outside basis differences of its foreign subsidiaries as it is not practicable and the Company has the ability and intent to indefinitely reinvest the undistributed earnings of its foreign subsidiaries, and there are no needs for such earnings in the United States that would contradict its plan to indefinitely reinvest.

13. Stockholders' Equity

Share Repurchases

In December 2023, the Board authorized and approved a stock repurchase of up to $25.0 million of the Company's common stock concurrent with the issuance of $600.0 million aggregate principal amount of its 2023 Notes. See Note 15, "*Convertible Senior Notes,*" for more information on the issuance. The Company used $14.4 million of the proceeds from the issuance of the 2023 Notes to repurchase 92,090 shares at a price of $156.22, including transaction costs, to offset the impact of dilution from the issuance of 2023 Notes and equity compensation programs as well as to reduce its outstanding share count. The Company has elected to retire the shares repurchased to date. Retired shares become part of the pool of authorized but unissued shares. The purchase price of the retired shares in excess of par value, including transaction costs, is recorded as a decrease to additional paid-in capital in the Company's consolidated balance sheets as of December 31, 2023.

Stock Option and Incentive Plans

At the Company's 2018 Annual Meeting of Stockholders held on May 16, 2018, the Company's shareholders approved the 2018 Stock Option and Incentive Plan (the "2018 Plan"). Under the 2018 Plan the number of shares of the Company's common stock that are reserved and available for issuance shall be 2,778,000 plus the number of shares of common stock available for issuance under the Company's Amended and Restated 2012 Stock Option and Incentive Plan (the "2012 Plan"). The shares of common stock underlying any awards under the 2018 Plan and 2012 Plan that are forfeited, canceled or otherwise terminated (other than by exercise) shall be added back to the shares of stock available for issuance under the 2018 Plan. At December 31, 2024, 1,479,932 shares were available for future grants under the 2018 Plan.

Former Chief Executive Officer Accounting Modifications

On June 12, 2024, upon approval by the Board, the Company entered into the Fourth Amended and Restated Employment Agreement (the "Transition Agreement") with the Company's former Chief Executive Officer ("CEO"), Tony J. Hunt, which amends and restates Mr. Hunt's Third Amended and Restated Employment Agreement with the Company dated as of May 26, 2022. Under the terms of the Transition Agreement, Mr. Hunt relinquished his position as the Company's CEO effective September 1, 2024 (the "Transition Date") and transitioned to a new role as Executive Chair of the Board beginning on the Transition Date (the "CEO Transition"). It is anticipated that Mr. Hunt will continue to be involved in the business as the Executive Chair of the Board until March 2026 and will continue to be employed by the Company as an advisor thereafter, until March 2027.

Under the terms of the Transition Agreement and the award agreements governing Mr. Hunt's outstanding equity awards, Mr. Hunt's unvested stock awards will continue to vest in accordance with their original terms. Furthermore, on June 28, 2024, the Company entered into an amendment (the "2024 Award Amendment") to the equity awards granted to Mr. Hunt in 2024, which consisted of a stock option, restricted stock units ("RSUs") and performance stock units ("PSUs" and together the "2024 Grants"). Pursuant to the terms of the 2024 Award Amendment, two-thirds of the 2024 Grants were forfeited, which equates to 32,776 shares of the Company's common stock.

Although Mr. Hunt's unvested equity awards continue to vest in accordance with their original terms and there has been no amendment to Mr. Hunt's outstanding equity awards other than the 2024 Award Amendment, the Company determined that under ASC 718, "Compensation - Stock Compensation", the CEO Transition represented a significant reduction in Mr. Hunt's operating role with the Company for accounting purposes. This determination resulted in a Type III accounting modification of certain of Mr. Hunt's unvested stock awards (improbable to probable) under ASC 718 (the "Equity Modification") on June 12, 2024. As a result, for accounting purposes only, Mr. Hunt's unvested awards were deemed cancelled and a new grant issued for his unvested shares with the value of these awards recalculated using a price of $136.00 per share, which was the opening stock price of the first day of trading following the public announcement of the CEO Transition.

As a result of the Equity Modification, the Company recognized stock-based compensation expense for the modified awards of $22.4 million over the remaining requisite service period, which the Company determined to be between June 13, 2024 and September 1, 2024 and represented the remaining service period of Mr. Hunt's role as CEO.

The Company determined that the PSUs granted to Mr. Hunt in 2022 and 2023 should be accounted for as a Type IV accounting modification (improbable to improbable) in accordance with ASC 718, because vesting conditions before and after June 12, 2024 were improbable of being achieved.

As a result of the Equity Modification and the forfeiture of the pro-rata portion of Mr. Hunt's 2024 Grants, the Company recognized $22.4 million of incremental stock-based compensation expense for the year ended December 31, 2024.

Stock Issued for Earnout Payment

In April 2024, the Company issued 28,638 shares of its common stock to former securityholders of Avitide to satisfy the contingent consideration obligation established under the Agreement and Plan of Merger and Reorganization (the "Avitide Agreement") which the Company entered into as part of the acquisition of Avitide in September 2021. In March 2024, the Company issued 2,770 shares of its common stock to former securityholders of FlexBiosys to satisfy the contingent consideration obligation established under the FlexBiosys Agreement, which the Company entered into as part of the acquisition of FlexBiosys in April 2023. The shares issued to FlexBiosys represent 20% of the earnout consideration earned in the First Earnout Year (as defined in the FlexBiosys Agreement) and the shares issued to Avitide represents 50% of the earnout consideration earned in the Second Earnout Year (as defined in the Avitide Agreement).

In May 2023, the Company issued 42,621 shares of its common stock to former securityholders of Avitide to satisfy the contingent consideration obligation established under the Agreement and Plan of Merger and Reorganization (the "Avitide Agreement") which the Company entered into as part of the Avitide Acquisition. See Note 5, *"Acquisitions"* above for additional information on the Avitide Acquisition and the contingent consideration. The shares represent 50% of the earnout consideration earned in the First Earnout Year (as defined in the Avitide Agreement).

Stock-Based Compensation

The Company recorded stock-based compensation expense of $48.1 million, $25.6 million and $27.3 million for the years ended December 31, 2024, 2023 and 2022, respectively, for share-based awards granted under the Plans. The following table presents stock-based compensation expense in the Company's consolidated statements of comprehensive income:

	For the Years Ended December 31,		
	2024	2023	2022
	(Amounts in thousands)		
Cost of product revenue	$ 1,948	$ 1,933	$ 2,525
Research and development	3,227	2,855	2,622
Selling, general and administrative	42,895	20,787	22,169
Total stock-based compensation	$ 48,070	$ 25,575	$ 27,316

Stock Options

The Company uses the Black-Scholes option pricing model to calculate the fair value of stock option awards on the grant date, and measures stock-based compensation costs of stock options at the grant date based on the estimated fair value of the award. The Company recognizes expense on awards with service-based vesting over the employee's requisite service period on a straight-line basis. The Company recognizes stock-based compensation expense for options that are ultimately expected to vest, and accordingly, such compensation expense has been adjusted for estimated forfeitures.

The fair value of stock option awards granted during the years ended December 31, 2024, 2023 and 2022 were calculated using the following estimated assumptions:

	For the Years Ended December 31,		
	2024	2023	2022
Expected term (in years)	5.09-6.5	5.14-6.5	5.5-6.5
Expected volatility (range)	46.09-48.50%	44.78-46.58%	41.44-43.96%
Risk-free interest rate	3.69-4.48%	3.56-4.71%	1.86-4.07%
Expected dividend yield	0%	0%	0%

Information regarding option activity for the year ended December 31, 2024, under the Plans is summarized below:

	Shares	Weighted average exercise price	Weighted-Average Remaining Contractual Term (in Years)	Aggregate Intrinsic Value (in Thousands)
Options outstanding at December 31, 2023	649,130	$ 85.97		
Granted	80,782	173.16		
Exercised	(99,679)	43.10		
Forfeited/expired/cancelled[1]	(34,027)	196.49		
Options outstanding at December 31, 2024	596,206	$ 98.64		
Options exercisable at December 31, 2024	349,744	$ 85.02		
Vested and expected to vest at December 31, 2024[2]	590,960	$ 98.05	5.37	$ 35,180

(1) Includes 13,057 options forfeited pursuant to the 2024 Award Amendment discussed above under "*Chief Executive Officer Accounting Modifications.*"

(2) Represents the number of vested options as of December 31, 2024 plus the number of unvested options expected to vest as of December 31, 2024, based on the unvested outstanding options at December 31, 2024 adjusted for estimated forfeiture rates of 8% for awards granted to non-executive level employees and 3% for awards granted to executive level employees.

The aggregate intrinsic value in the table above represents the total pre-tax intrinsic value (the difference between the closing price of the common stock on December 31, 2024, the last business day of 2024, of $143.94 per share and the exercise price of each in-the-money option) that would have been received by the option holders had all option holders exercised their options on December 31, 2024. The aggregate intrinsic value of stock options exercised during the years ended December 31, 2024, 2023 and 2022 was $10.4 million, $5.8 million and $14.1 million, respectively.

The weighted average grant date fair value of options granted during the years ended December 31, 2024, 2023 and 2022 was $88.00, $84.37 and $87.40, respectively. The total fair value of stock options that vested during the years ended December 31, 2024, 2023 and 2022 was $7.8 million, $4.7 million and $3.1 million, respectively.

Stock Units

The fair value of stock units is calculated using the closing price of the Company's common stock on the date of grant. The Company recognizes expense on awards with service-based vesting over the employee's requisite service period on a straight-line basis. The Company recognizes expense on performance-based awards over the vesting period based on the probability that the performance metrics will be achieved. Information regarding stock unit activity, which includes activity for restricted stock units and performance stock units, for the year ended December 31, 2024 under the Plans is summarized below:

	Shares	Weighted Average Grant Date Fair Value
Unvested at December 31, 2023	474,320	$ 155.59
Awarded	232,519	177.36
Vested	(148,429)	148.16
Forfeited/cancelled[1]	(87,798)	189.71
Unvested at December 31, 2024	470,612	$ 162.33
Vested and expected to vest at December 31, 2024[2]	412,863	$ 160.77

(1) Includes 13,146 RSUs and 6,573 PSUs forfeited pursuant to the 2024 Award Amendment discussed above under "*Chief Executive Officer Accounting Modifications.*"

(2) Represents the number of vested stock units as of December 31, 2024, plus the number of unvested stock units expected to vest as of December 31, 2024, based on the unvested outstanding stock units at December 31, 2024 adjusted for estimated forfeiture rates of 8% for awards granted to non-executive level employees and 3% for awards granted to executive level employees.

The aggregate intrinsic value of stock units vested during the years ended December 31, 2024, 2023 and 2022 was $26.7 million, $35.7 million and $43.9 million, respectively. The total fair value of stock units that vested during the years ended December 31, 2024, 2023 and 2022 was $22.0 million, $26.2 million and $22.7 million, respectively.

As of December 31, 2024, there was $56.5 million of total unrecognized compensation cost related to unvested share-based awards. This cost is expected to be recognized over a weighted average remaining requisite service period of 2.7 years. The Company expects 2,305,232 unvested options and stock units to vest over the next five years.

14. Commitments and Contingencies

License Agreement

On September 19, 2022, the Company entered into a 15-year exclusive License Agreement (the "Daylight Agreement") with DRS Daylight Solutions, Inc. ("Daylight"), giving the Company exclusive license and commercialization rights to use certain technology and intellectual property subject to conditions set forth in the Daylight Agreement. The Company agreed to pay Daylight (i) an initial, one-time, non-refundable, non-creditable upfront cash payment and (ii) certain quarterly royalty payments. The Daylight Agreement was amended in 2024 to extend the License Agreement one additional year.

Pursuant to the Daylight Agreement, the Company obtains the exclusive, non-transferrable, right and license to use specifically in the field of bioprocessing, the Daylight intellectual property called Culpeo® QCL-IR Liquid Analyzer ("Culpeo"), which is a compact, intelligent

spectrometer that uses the power of quantum cascade lasers to analyze and identify chemicals. Under the Daylight Agreement, the Company assumes responsibility for the commercialization and sale of Culpeo, in addition to the ability to incorporate the intellectual property into optimized products over the term of the Daylight Agreement. Daylight will continue to sell the products in the specified fields of Aerospace and Defense.

Collaboration Agreements

The Company licenses certain technologies that are, or may be, incorporated into its technology under several agreements and also has entered into several clinical research agreements that require the Company to fund certain research projects. Generally, the license agreements require the Company to pay annual maintenance fees and royalties on product sales once a product has been established using the technologies. R&D expenses associated with license agreements were immaterial amounts for the years ended December 31, 2024, 2023 and 2022.

In June 2018, the Company secured an agreement with Navigo Proteins GmbH ("Navigo") for the exclusive co-development of multiple affinity ligands for which Repligen holds commercialization rights. The Company is manufacturing and supplying the first of these ligands, NGL-Impact®, exclusively to Purolite, who is pairing the Company's high-performance ligand with Purolite's agarose jetting base bead technology used in their Jetted A50 Protein A resin product. The Company also signed a long-term supply agreement with Purolite for NGL-Impact and other potential additional affinity ligands that may advance from the Company's Navigo collaboration. In September 2020, the Company and Navigo successfully completed co-development of an affinity ligand targeting the SARS-CoV-2 spike protein, to be utilized in the purification of vaccines for the COVID-19 pandemic, including emerging variants of the SARS-CoV-2 coronavirus. The Company has proceeded with scaling up and manufacturing this ligand and the development and validation of the related affinity chromatography resin, which is marketed by the Company. In September 2021, the Company and Navigo successfully completed co-development of a novel affinity ligand that addresses aggregation issues associated with pH sensitive antibodies and Fc-fusion proteins. The Company is manufacturing and supplying this ligand, NGL-Impact® HipH, to Purolite. The Navigo and Purolite agreements are supportive of the Company's strategy to secure and reinforce the Company's proteins business. The Company made royalty payments to Navigo of $3.1 million, $3.8 million and $2.6 million in the years ended December 31, 2024, 2023 and 2022, respectively, in connection with this program, which are recorded to research and development expenses in the Company's consolidated statements of comprehensive income.

Purchase Orders, Supply Agreements and Other Contractual Obligations

In the normal course of business, the Company has entered into purchase orders and other agreements with manufacturers, distributors and others. Outstanding obligations, inclusive of minimum purchase commitments, at December 31, 2024 were $37.9 million. Future commitments to be settled in one year is $31.0 million, $5.3 million to be settled in one to three years, and $1.6 million to be settled in three to five years.

Legal Proceedings

From time to time, in the normal course of its operations, the Company is subject to litigation matters and claims relating to employee relations, business practices and patent infringement. Litigation can be expensive and disruptive to normal business operations. Moreover, the results of complex legal proceedings are difficult to predict, and the Company's view of these matters may change in the future as the litigation and events related thereto unfold. The Company expenses legal fees as incurred. The Company records a provision for contingent losses when it is both probable that a liability has been incurred and the amount of the loss can be reasonably estimated. An unfavorable outcome to any legal matter, if material, could have an adverse effect on the Company's operations or its financial results.

15. Convertible Senior Notes

The carrying value of the Company's convertible senior notes is as follows:

	December 31, 2024	December 31, 2023
	(Amounts in thousands)	
1.00% Convertible Senior Notes due 2028:		
Principal amount	$ 600,000	$ 600,000
Unamortized debt discount	(67,712)	(81,457)
Unamortized debt issuance costs	(6,721)	(8,400)
Carrying amount - Convertible Senior Notes due 2028, net	$ 525,567	$ 510,143
0.375% Convertible Senior Notes due 2024:		
Principal amount	$ —	$ 69,700
Unamortized debt issuance costs	—	(248)
Carrying amount - Convertible Senior Notes due 2024, net	$ —	$ 69,452

1.00% Convertible Senior Notes due 2028

On December 14, 2023, the Company issued $600.0 million aggregate principal amount of its 2023 Notes in the Exchange and Subscription Agreements with a limited number of holders of its outstanding 2019 Notes and certain other qualified institutional buyers pursuant to Rule 144A under the Securities Act. Pursuant to the Exchange and Subscription Agreements, the Company exchanged $217.7 million of its 2019 Notes, which were cancelled upon exchange, for $309.9 million aggregate principal amount of the 2023 Notes (the "Exchange Transaction") and issued $290.1 million aggregate principal amount of the 2023 Notes in a private placement to accredited institutional buyers (the "Subscription Transactions") for $290.1 million in cash.

The Company evaluated the Exchange Transaction and determined approximately $29.6 million of the $217.7 million principal of the exchanged 2019 Notes should be accounted for as extinguishments of debt and approximately $188.1 million should be accounted for as modification of debt. As a result, the Company recognized a $12.7 million loss on extinguishments of debt in its consolidated statements of comprehensive income (loss) for the year ended December 31, 2023, inclusive of $0.1 million of unamortized debt issuance costs. Under debt modification accounting, the carrying amount of the modified 2019 Notes was reduced by $2.8 million, with a corresponding increase to additional paid-in capital, to account for the increase in the fair value of the embedded conversion option, representing a debt discount of the modified 2019 Notes. The aggregate debt discount of $67.7 million as of December 31, 2024, is comprised of $65.5 million increase in principal of the modified 2019 Notes and a $2.2 million increase in the fair value of the embedded conversion option. These amounts are presented as a direct reduction from the carrying value of the convertible debt in their respective periods in our consolidated balance sheets. This amount is being accreted into interest expense in the consolidated statements of comprehensive income (loss) using the effective interest method over the term of the 2023 Notes.

Proceeds from the Subscription Transactions were $276.1 million, net of debt issuance costs of $13.9 million. The Exchange Transaction resulted in $6.2 million of the debt issuance costs related to the modified 2019 Notes, which were expensed as incurred in accordance with modification accounting, and $7.7 million of deferred debt issuance costs related to the 2023 Notes, which were recorded as a direct deduction to the carrying value of the 2023 Notes on the Company's consolidated balance sheets. The Company will amortize the $7.8 million of debt issuance costs of the 2023 Notes into amortization of debt issuance costs in the Company's consolidated statements of comprehensive income over the remaining term of the 2023 Notes. The carrying value of the 2023 Notes of $525.6 million and $510.1 million is included in long-term debt on the Company's condensed consolidated balance sheets as of December 31, 2024 and 2023, respectively.

The Company used $14.4 million of the proceeds from the Subscription Transactions to repurchase shares of its common stock from certain purchasers of the 2023 Notes. See Note 13, *"Stockholders' Equity - Share Repurchases"* for additional information related to this repurchase. The Company will also use a portion of the proceeds to finance in part, the settlement upon conversion or repurchase of the remaining 2019 Notes at or prior to maturity. The remainder of the proceeds will be used for working capital and general corporate purposes, including to fund possible acquisitions of, or investments in, complementary businesses, products, services and technologies.

The 2023 Notes are senior, unsecured obligations of the Company, and bear interest at a rate of 1.00% per year. Interest is payable semi-annually in arrears on each June 15 and December 15, commencing on June 15, 2024. The 2023 Notes will mature on December 15, 2028, unless earlier redeemed, repurchased or converted. The initial conversion rate for the 2023 Notes is 4.9247 shares of the Company's

common stock per $1,000 principal amount of 2023 Notes, which is equivalent to an initial conversion price of $203.06 per share and represents a 30% premium over the last reported sale price of $156.20 per share on December 6, 2023, the date on which the 2023 Notes were priced. Prior to the close of business on the business day immediately preceding September 15, 2028, the 2023 Notes will be convertible at the options of the holders of 2023 Notes only upon the satisfaction of specified conditions and during certain periods into cash up to their principal amount, and into cash, shares of the Company's common stock or a combination thereof, at the Company's election, for the conversion value above the principal amount, if any. Thereafter until the close of business on the second scheduled trading day immediately preceding the maturity date, the 2023 Notes will be convertible at the option of the holders of 2023 Notes at any time regardless of these conditions. The Company may redeem for cash, all or a portion of the 2023 Notes, at its option, on or after December 18, 2026 and prior to the 21st scheduled trading day immediately preceding the maturity date at a redemption price of 100% of the principal amount of the 2023 Notes to be redeemed, plus accrued and unpaid interest to, but excluding the redemption date, if certain conditions are met in accordance to the indenture governing the 2023 Notes (the "2023 Notes Indenture").

If the Company undergoes a "fundamental change" (as defined in the 2023 Notes Indenture), the holders of the 2023 Notes may require the Company to repurchase for cash all or part of their 2023 Notes at a purchase price equal to 100% of the principal amount of the 2023 Notes to be repurchased, plus accrued and unpaid interest, if any, up to, but excluding, the fundamental change repurchase date. In addition, if certain "make-whole fundamental changes" (as defined in 2023 Notes Indenture) occur or the Company calls all or a portion of the 2023 Notes for redemption, the Company will, in certain circumstances, increase the conversion rate for any 2023 Notes converted in connection with such make-whole fundamental change or any 2023 Notes called for redemption that are converted during the related redemption period.

Interest expense recognized on the 2023 Notes in 2024 was $6.0 million and $13.7 million for the contractual coupon interest and accretion of the debt discount, respectively. Amortization of debt issuance costs recorded in 2024 related to the 2023 Notes was $1.6 million. The effective interest rate on the 2023 Notes is 4.39%, which included the interest on the 2023 Notes and amortization of the debt discount and issuance costs. As of December 31, 2024, the carrying value of the 2023 Notes was $525.6 million and the fair value of the principal was $546.1 million. The fair value of the 2023 Notes was determined based on the most recent trade activity of the 2023 Notes as of December 31, 2024.

The 2023 Notes Indenture contains customary terms and events of default. If an event of default (other than certain events of bankruptcy, insolvency or reorganization involving the Company) occurs and is continuing, the holders of at least 25% in aggregate principal amount of the outstanding 2023 Notes may declare 100% of the principal of, and any accrued and unpaid interest on, all of the 2023 Notes to be due and payable. Upon the occurrence of certain events of bankruptcy, insolvency or reorganization involving the Company, 100% of the principal of and accrued and unpaid interest, if any, on all of the 2023 Notes will become due and payable automatically. Notwithstanding the foregoing, the 2023 Notes provide that, to the extent the Company elects and for up to 365 days, the sole remedy for an event of default relating to certain failures by the Company to comply with certain reporting covenants consist exclusively of the right to receive additional interest on the 2023 Notes. The Company is not aware of any events of default that would allow holders to declare the principal of, and any accrued and unpaid interest on, all of the 2023 Notes to be due and payable.

0.375% Convertible Senior Notes due 2024

The Company issued $287.5 million aggregate principal amount of the 2019 Notes on July 19, 2019 in a transaction which included the underwriters' exercise in full of an option to purchase an additional $37.5 million aggregate principal amount of 2019 Notes (the "Notes Offering"). The net proceeds of the Notes Offering, after deducting underwriting discounts and commissions and other related offering expenses payable by the Company, were approximately $278.5 million. Immediately following the closing of the Exchange Transaction mentioned above, $69.7 million in aggregate principal amount of the 2019 Notes remain outstanding.

The 2019 Notes are senior, unsecured obligations of the Company, and bear interest at a rate of 0.375% per year. Interest is payable semi-annually in arrears on January 15 and July 15 of each year, beginning on January 15, 2020. The remaining 2019 Notes will mature on July 15, 2024, unless earlier repurchased or converted in accordance with their terms. The initial conversion rate for the 2019 Notes is 8.6749 shares of the Company's common stock per $1,000 principal amount of 2019 Notes (which is equivalent to an initial conversion price of approximately $115.28 per share). Prior to the close of business on the business day immediately preceding April 15, 2024, the 2019 Notes will be convertible at the option of the holders of 2019 Notes only upon the satisfaction of specified conditions and during certain periods. Thereafter until the close of business on the second scheduled trading day immediately preceding the maturity date, the remaining 2019 Notes will be convertible at the options of the holders of 2019 Notes at any time regardless of these conditions. Prior to March 4, 2022,

conversion of the 2019 Notes could have been settled in cash, shares of the Company's common stock or a combination thereof, at the Company's election. On March 4, 2022, the Company entered into the Second Supplemental Indenture for the 2019 Notes, which irrevocably elected to settle the conversion of the 2019 Notes using a combination of cash and the Company's common stock, settling the par value of the 2019 Notes in cash and any excess conversion premium in shares. The 2019 Notes are not redeemable by the Company prior to maturity.

Holders of 2019 Notes may require the Company to repurchase their 2019 Notes upon the occurrence of a fundamental change prior to maturity at a repurchase price equal to 100% of the principal amount thereof, plus accrued and unpaid interest to, but excluding, the date of repurchase. In connection with certain corporate events, the Company will, under certain circumstances, increase the conversion rate for holders of 2019 Notes who elect to convert their 2019 Notes in connection with such corporate events.

During the fourth quarter of 2023, the closing price of the Company's common stock exceeded 130% of the conversion price of the 2019 Notes for more than 20 trading days of the last 30 consecutive trading days of the quarter. As a result, the remaining $69.7 million aggregate principal amount of 2019 Notes were convertible at the option of the holders of the 2019 Notes during the first quarter of 2024. During 2024, $0.2 million aggregate principal amount of the 2019 Notes converted, bringing the remaining outstanding 2019 Notes to $69.5 million in aggregate principal amount. The remaining 2019 Notes matured and were paid off in full on July 15, 2024. The Company irrevocably elected to settle the conversion of the 2019 Notes using a combination of cash and the Company's common stock, settling the par value of the 2019 Notes in cash and any excess conversion premium in shares. In connection with the conversion, the Company paid $69.6 million in cash, which included principal and accrued interest, and issued 100,944 shares of the Company's common stock representing the conversion premium.

Prior to the adoption of ASU 2020-06, the Company accounted for the 2019 Notes as a liability and equity component where the carrying value of the liability component was valued based on a similar debt instrument. In accounting for the issuance of the 2019 Notes, the Company separated the 2019 Notes into liability and equity components. The carrying value of the liability component was calculated as the present value of its cash flows using a discount rate of 4.5% based on comparative convertible transactions for similar companies. The carrying value of the equity component representing the conversion option was determined by deducting the fair value of the liability component from the par value of the 2019 Notes as a whole. The excess of the principal amount of the liability component over its carrying value amount, referred to as the debt discount, was amortized to interest expense on our consolidated statements of comprehensive income over the five-year term of the 2019 Notes. The equity component was not re-measured as long as it continued to meet the conditions for equity classification. The equity component related to the 2019 Notes recorded at issuance was $52.1 million, which was recorded in additional paid-in capital on the Company's consolidated balance sheets.

In accounting for the transaction costs related to the issuance of the 2019 Notes, the Company allocated the total costs incurred to the liability and equity components of the 2019 Notes using the same proportions as the initial carrying value of the 2019 Notes. Transaction costs related to the liability component were $7.4 million and are amortized to interest expense using the effective interest method over the five-year term of the 2019 Notes. Transaction costs attributable to the equity component were $1.6 million and are netted with the equity component of the 2019 Notes in stockholders' equity of the Company's consolidated balance sheets. Additionally, the Company recorded a net deferred tax liability of $11.4 million.

Effective January 1, 2022, the Company adopted ASU 2020-06. After adoption, the Company now accounts for the 2019 Notes, and any convertible debt issued going forward, as a single liability measured at amortized cost. As the equity component is no longer required to be split into a separate component, the Company recorded a net adjustment for the initial $50.4 million that was allocated to additional paid-in capital and $22.9 million of life-to-date interest expense recorded as amortization of debt discount. Additionally, the net deferred tax liability recorded for the 2019 Notes was reversed. The principal amount of the liability over its carrying amount is amortized to interest expense over the five-year term of the 2019 Notes. Since the 2019 Notes are classified as a single liability, there is no debt discount required to be amortized in 2022.

Contractual coupon interest expense related to the 2019 Notes was $0.1 million in 2024 and the Company recorded $0.2 million of amortization of the debt issuance costs related to the 2019 Notes.

16. Employee Benefit Plans

In the United States, the Repligen Corporation 401(k) Savings and Retirement Plan (the "401(k) Plan") is a qualified defined contribution plan in accordance with Section 401(k) of the Internal Revenue Code. All U.S. employees over the age of 21 are eligible to make pre-tax contributions up to a specified percentage of their compensation. Under the 401(k) Plan, the Company may, but is not obligated to match a portion of the employees' contributions up to a defined maximum. The match is calculated on a calendar year basis. The Company matched $2.9 million, $3.0 million and $2.7 million in the years ended December 31, 2024, 2023 and 2022, respectively.

In Sweden, the Company contributes to a government-mandated occupational pension plan that is a qualified defined contribution plan. All employees in Sweden are eligible for this pension plan. The Company pays premiums to a third-party occupational pension specialist who administers the pension plan. These premiums are based on various factors including each employee's age, salary, employment history and selected benefits in the pension plan. When an employee terminates or retires, these premium payments cease for that employee and the Company has no further pension-related obligations for that employee. The Company contributed $1.2 million, $1.0 million and $1.1 million, respectively to the defined contribution plan for the years ended December 31, 2024, 2023 and 2022.

17. Related Party Transactions

Certain facilities leased by Spectrum LifeSciences LLC ("Spectrum") are owned by the Roy Eddleman Living Trust (the "Trust"). As of December 31, 2024, the Trust owned greater than 5% of the Company's outstanding shares. Therefore, the Company considers the Trust to be a related party. The lease amounts paid to the Trust prior to the public offering were negotiated in connection with the acquisition of Spectrum. The Company incurred rent expense related to these leases totaling $0.6 million, $0.7 million and $0.7 million for the years ended December 31, 2024, 2023 and 2022.

18. Subsequent Events

Acquisition of Bioprocessing Analytics Portfolio from 908 Devices Inc.

On March 4, 2025, the Company entered into a Securities and Asset Purchase Agreement with 908 Devices Inc. ("908 Devices") to acquire their desktop portfolio of four devices for bioprocessing process analytical technology (PAT) applications. 908 Devices is headquartered in Boston, Massachusetts. The addition of these desktop assets complements and strengthens Repligen's differentiated PAT portfolio that provides its biopharmaceutical and CDMO customers with actionable insights to optimize development processes and improve manufacturing efficiencies.

The Company will account for the 908 Devices Acquisition as a purchase of a business under the acquisition method of accounting and has engaged a third-party valuation firm to assist with the valuation of the business acquired. The required disclosures under ASC 805, "Business Combinations" will be included in the Quarterly Report on Form 10-Q for the period ended March 31, 2025.

Exhibit 21.1

SUBSIDIARIES OF THE REGISTRANT

Subsidiary Name	Subsidiary Jurisdiction
Repligen Sweden AB	Sweden
Repligen GmbH	Germany
Repligen Singapore Pte. Ltd.	Singapore
Repligen Europe B.V.	Netherlands
Repligen (Shanghai) Biotechnology Co. Ltd.	China
Repligen Japan LLC	Japan
Repligen India Private Limited	India
Repligen Korea Co., Ltd.	South Korea
ARTeSYN Biosolutions Holdings Ireland Ltd.	Ireland
ARTeSYN Biosolutions Ireland Limited	Ireland
Repligen Estonia OÜ	Estonia
Repligen Ireland Limited	Ireland
Spectrum Life Sciences, LLC	United States
C Technologies, Inc.	United States
Polymem S.A.	France
Repligen UK Limited	United Kingdom
FlexBiosys Inc.	United States
Metenova Holding AB	Sweden
Metenova AB	Sweden
Metenova America Inc.	United States
Tantti Laboratory Inc	Taiwan

Exhibit 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in the following Registration Statements:

(1) Registration Statement (Form S-8 No. 333-224978) pertaining to the 2018 Stock Option and Incentive Plan of Repligen Corporation, and
(2) Registration Statement (Form S-8 No. 333-196456) pertaining to the Repligen Corporation Amended and Restated 2012 Stock Option and Incentive Plan;

of our reports dated March 13, 2025, with respect to the consolidated financial statements of Repligen Corporation and the effectiveness of internal control over financial reporting of Repligen Corporation, included in this Annual Report (Form 10-K) of Repligen Corporation for the year ended December 31, 2024.

/s/ Ernst & Young LLP

Boston, Massachusetts
March 13, 2025

Exhibit 31.1

CERTIFICATION

I, Olivier Loeillot, certify that:

1. I have reviewed this Annual Report on Form 10-K of Repligen Corporation;

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

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

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

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

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

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

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

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

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

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

Date: March 13, 2025

/S OLIVIER LOEILLOT

Olivier Loeillot
Chief Executive Officer
(Principal executive officer)

Exhibit 31.2

CERTIFICATION

I, Jason K. Garland, certify that:

1. I have reviewed this Annual Report on Form 10-K of Repligen Corporation;

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

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

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

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

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

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

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

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

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

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

Date: March 13, 2025

/S/ JASON K. GARLAND

Jason K. Garland
Chief Financial Officer
(Principal financial officer)

Exhibit 32.1

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

In connection with the Annual Report on Form 10-K of Repligen Corporation (the "Company") for the fiscal year ending December 31, 2024 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), the undersigned officers of the Company hereby certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to their knowledge:

(1) The Report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

This certification is being provided pursuant to 18 U.S.C. 1350 and is not to be deemed a part of the Report, nor is it to be deemed to be "filed" for any purpose whatsoever.

Date: March 13, 2025

By: /S/ OLIVIER LOEILLOT
Olivier Loeillot
Chief Executive Officer
(Principal executive officer)

Date: March 13, 2025

By: /S/ JASON K. GARLAND
Jason K. Garland
Chief Financial Officer
(Principal financial officer)

Board of Directors

Tony J. Hunt
Former Chief Executive Officer,
Repligen Corporation

Karen A. Dawes
Lead Independent Director
President, Knowledgeable
Decisions, LLC

Nicolas M. Barthelemy
Former President and Chief Executive
Officer, bioTheranostics

Carrie Eglinton Manner
President and Chief Executive Officer,
OraSure Technologies, Inc.

Konstantin Konstantinov, Ph.D.
Chief Technology Officer,
Ring Therapeutics

Olivier Loeillot
President and Chief Executive Officer
Repligen Corporation

Martin D. Madaus, D.V.M., Ph.D.
Senior Operating Executive,
The Carlyle Group

Rohin Mhatre, Ph.D.
Executive Vice President and Chief
Technical Officer, Parabilis Medicines
(formerly Fog Pharmaceuticals, Inc.)

Glenn P. Muir
Former Chief Financial Officer
and Executive Vice President,
Hologic, Inc.

Margaret A. Pax
Former Vice President,
Strategy and Innovation,
Thermo Fisher Scientific

External Corporate Counsel

Goodwin Procter LLP
100 Northern Avenue
Boston, MA 02210

Independent Accountants

Ernst & Young LLP
200 Clarendon Street
Boston, MA 02116

Executive Management

Executive Officers:

Olivier Loeillot
President and
Chief Executive Officer

Jason K. Garland
Chief Financial Officer

James R. Bylund
Chief Operating Officer

Ralf Kuriyel
Senior Vice President,
Research & Development

Senior Management:

Surendra Balekai
Vice President, Fluid Management

Brian Douglass
Senior Vice President, Filtration and
Chromatography

Teresa Ferragamo
Senior Director,
Marketing

Leslie Galvin
Vice President, Human Resources

Kola Otitoju
Senior Vice President, Strategy
and Business Development

Keith Lee Robinson
Chief Information Officer

Umay Saplakoglu
Vice President, Proteins and
Incubator

Greg Titus
Senior Vice President,
Commercial Development

Greg Verni
Vice President, Fluid Management

Neil Whitfield
Senior Vice President, Sales

Market for Repligen Stock

NASDAQ Global Select Market: RGEN

Transfer Agent and Registrar

Equiniti Trust Company
PO Box 500
Newark, NJ 07101
helpast@equiniti.com

The Transfer Agent is responsible for handling shareholder questions regarding lost certificates, address changes and change of ownership or name in which shares are held.

Investor Information

Copies of our annual reports on Form 10-K, proxy statements, quarterly reports on Form 10-Q and current reports on Form 8-K are available to shareholders upon request without charge.

Please visit our website at www.repligen.com or direct requests to:

Repligen Corporation
41 Seyon Street, Building #1, Suite 100
Waltham, MA 02453
ATTN: Investor Relations
Phone: 781.250.0111
investors@repligen.com

Virtual Annual Meeting

The Annual Meeting of Shareholders will be held at 8:00 a.m. EDT, Thursday, May 15, 2025.

Location
Our 2025 Annual Meeting will be held online (only) at http://www.virtualshareholdermeeting.com/RGEN2025

You can vote your shares if you were a shareholder of record at the close of business on March 24, 2025 (the "Record Date").