

A large graphic of the year '2023' where the digits are formed by multiple concentric, overlapping curved lines. The lines are colored in white and light green, creating a sense of depth and movement.

PROXY
STATEMENT

2023 ANNUAL
MEETING OF
SHAREHOLDERS

Notice of 2023 Annual Meeting of Shareholders and Proxy Statement

ANNUAL MEETING



DATE:
Thursday
May 18, 2023



TIME:
8:00 a.m. ET



LOCATION:
The meeting will be held virtually at
www.virtualshareholdermeeting.com/RGEN2023

ITEMS OF BUSINESS

1. To elect eight (8) directors, nominated by the Board of Directors, as more fully described in the Proxy Statement
2. To consider and ratify the selection of Ernst & Young LLP as independent registered public accountants for the fiscal year ending December 31, 2023
3. To consider and act upon a non-binding, advisory vote to approve the compensation of our named executive officers (“say-on-pay”)
4. To consider and act upon a non-binding, advisory vote on the frequency of future advisory votes on the compensation of our named executive officers (“say-on-frequency”)
5. To approve an amendment to our Certificate of Incorporation to permit the Board of Directors to adopt, amend or repeal our By-laws
6. To approve the ratification of the amendment and restatement of the By-laws adopted by the Board of Directors on January 27, 2021 to implement shareholder proxy access

NOTE: The Board of Directors will consider and act upon any other business which may properly come before the meeting.

WHO CAN VOTE

Shareholders of Repligen Corporation Common Stock at the close of business on March 20, 2023 (our “Record Date”). It is important that your shares be represented and voted at the 2023 Annual Meeting of Shareholders (the “Annual Meeting”). Whether or not you plan to attend the virtual Annual Meeting, please complete and return the enclosed proxy card in the envelope provided or vote by internet or telephone pursuant to instructions provided with the proxy card.

HOW TO VOTE

Our Annual Meeting will again be held in a virtual meeting format only, via the internet, with no physical in-person meeting. At our virtual Annual Meeting, shareholders will be able to attend, vote and submit questions as set forth in this section.

Voting instructions are the same for registered shareholders (shares are registered in your name with Repligen’s transfer agent, American Stock Transfer) and beneficial owners (shares are held in a stock brokerage account or by a bank or other holder of record). Here’s how to vote prior to the Annual Meeting:



By internet at
www.proxyvote.com



By phone
1-800-690-6903



By mail, complete and return
your proxy card or
voting instruction form

You may also vote at the Annual Meeting via www.virtualshareholdermeeting.com/RGEN2023. You will need the 16-digit control number included with these proxy materials to vote electronically, to vote by phone, and/or to attend the virtual Annual Meeting. A technical support telephone number will be posted on the Annual Meeting login page so that you can call if you encounter any difficulties accessing the Annual Meeting during the check-in or during the meeting.

Execution of a proxy card, or voting by telephone or via the internet prior to the Annual Meeting, will not in any way limit a shareholder’s right to attend the virtual Annual Meeting and vote during the meeting.

HOW TO SUBMIT QUESTIONS

During the Annual Meeting, if you have your 16-digit control number and wish to ask a question, you may do so by clicking the Q&A button on the virtual meeting platform and entering your question in the text box. If questions submitted are repetitive as to a particular topic, the Chairperson of the meeting may limit discussion on such topic. During the formal portion of the meeting, all questions presented should relate directly to the proposal under discussion. We will also hold a question and answer period at the end of the meeting, as time permits, during which time we welcome questions not relating to specific proposals.

DATE OF MAILING

Our Annual Report to Shareholders, containing a letter from our CEO and financial statements for the fiscal year ended December 31, 2022, is being provided together with this Proxy Statement to all stockholders entitled to vote at the Annual Meeting. It is anticipated that this Proxy Statement and the accompanying proxy will be first sent or given to shareholders on or about April 11, 2023.

By Order of the Board of Directors

A handwritten signature in black ink, appearing to read 'Jon Snodgres', with a long horizontal stroke extending to the right.

Jon Snodgres
Chief Financial Officer
April 11, 2023

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PROXY STATEMENT SUMMARY

This summary highlights information contained elsewhere in the Proxy Statement. As this summary does not contain all the information that you should consider in connection with the 2023 Annual Meeting of Shareholders (the “Annual Meeting”), we recommend reading the entire Proxy Statement carefully before voting.

References throughout the Proxy Statement 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.

VOTING MATTERS

Proposal	Description	Board Recommendation
Proposal 1: Election of directors (page 15)	We are asking our shareholders to elect each of the eight (8) directors identified below to serve until the 2024 Annual Meeting of Shareholders.	FOR each nominee
Proposal 2: Ratification of the selection of the independent registered public accounting firm (page 30)	We are asking our shareholders to ratify our Audit Committee’s selection of Ernst & Young LLP (“E&Y”) to act as the independent registered public accounting firm for Repligen in 2023. Although shareholder approval of the Audit Committee’s selection of E&Y is not required, our Board of Directors (“Board”) believes we should provide an opportunity for our shareholders to ratify this selection.	FOR
Proposal 3: Advisory vote on executive compensation (page 32)	We are asking our shareholders to cast a non-binding, advisory vote to approve the compensation of our named executive officers (“NEOs”). In evaluating this year’s “say-on-pay” proposal, we recommend you review our Compensation Discussion and Analysis, describing how the Compensation Committee arrived at its executive compensation actions and decisions for 2022.	FOR
Proposal 4: Advisory vote on frequency of future advisory votes on the compensation of our NEOs (page 33)	We are asking our shareholders to cast a non-binding, advisory vote on the frequency of future “say on pay” proposals.	1 YEAR
Proposal 5: Approval of amendment to our Certificate of Incorporation (page 34)	We are asking our shareholders to approve an amendment to our Certificate of Incorporation, as amended, to permit the Board to adopt, amend, or repeal the By-laws.	FOR
Proposal 6: Approve the ratification of amendment and restatement of our By-laws (page 36)	We are asking our shareholders to approve the ratification of the amendment and restatement of our By-laws adopted by the Board on January 27, 2021 to implement shareholder proxy access.	FOR

Please see the sections titled “General Annual Meeting Information” on page 64, and “Additional Information” on page 67 for important information about the proxy materials, including voting methods, vote requirements for adoption of each proposal, effect of abstentions and the deadlines to submit shareholder proposals and director nominations for next year’s annual meeting of shareholders.

OUR DIRECTOR NOMINEES

You are being asked to vote on the election of the following eight (8) nominees to our Board. All directors are elected annually by the affirmative vote of a majority of votes cast. The chart below summarizes our director nominees' personal information and current committee memberships. You can find detailed information about each director nominee's background, skill sets and areas of expertise later in this Proxy Statement.

Name and principal occupation	Age ⁽¹⁾	Director		Other Public Boards	Current Committee Memberships		
		Since	Independent		Audit	Compensation	Nominating & Corporate Governance
Tony J. Hunt <i>President, Chief Executive Officer, Repligen Corporation</i>	59	2015		1			
Karen A. Dawes, Chairperson <i>President, Knowledgeable Decisions, LLC</i>	71	2005	✓	2			CHAIR
Nicolas M. Barthelemy <i>Former President and Chief Executive Officer, bioTheranostics</i>	57	2014	✓	-		CHAIR	•
Carrie Eglinton Manner <i>President and Chief Executive Officer, OraSure Technologies, Inc.</i>	49	2020	✓	-	•		
Konstantin Konstantinov, Ph.D. <i>Chief Technology Officer, Codiak BioSciences⁽²⁾</i>	65	2022	✓	-			•
Martin D. Madaus, D.V.M., Ph.D. <i>Senior Operating Executive, The Carlyle Group⁽³⁾</i>	63	2023	✓	2	•		•
Rohin Mhatre, Ph.D. <i>Senior Vice President, Product and Technology Development, Biogen Inc.</i>	58	2020	✓	-		•	
Glenn P. Muir <i>Retired Chief Financial Officer and Executive Vice President, Hologic, Inc.</i>	64	2015	✓	2	CHAIR	•	

(1) Age as of the date of the Annual Meeting.

(2) Dr. Konstantinov joined the Board on May 26, 2022.

(3) Dr. Madaus joined the Board on February 6, 2023.

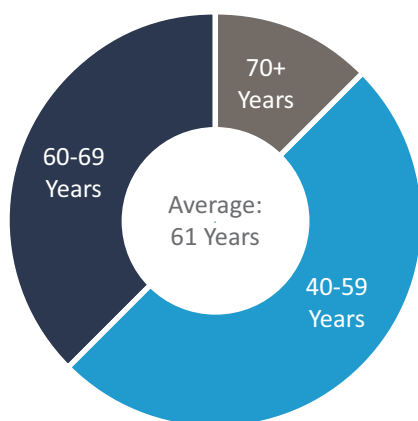
BOARD COMPOSITION

We continuously evaluate our director skill sets and expertise for alignment with Repligen's strategic goals. Our independent directors bring extensive experience in areas that are critical to the Company's strategy and long-term success, such as biopharmaceutical manufacturing, global and commercial operations, and finance. Below we highlight the key skills and experiences of our director nominees that are critical to Repligen's success.

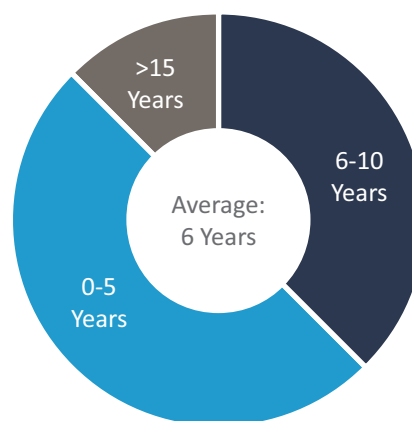
In addition to diversity of skills and experience, we believe that establishing and maintaining a Board that includes diverse demographics, such as gender, race, ethnicity, culture, nationality and sexual orientation, is important because having varying perspectives and a breadth of experience improves the quality of dialogue, contributes to more effective decision-making on behalf of the Company and its shareholders and enhances the overall chemistry and collaborative culture in the boardroom. Our Board includes directors who represent ethnic and gender diversity, and two (2) of our eight (8) director nominees are women, one of whom serves as the Chairperson of our Board.

Director Nominee	Key Skills & Experience						
	Public Company Board/CEO	Risk Oversight	Finance & Capital Markets	Manufacturing & Global Operations	Strategic Planning and M&A	Life Sciences Technology & Innovation	Commercial Sales & Marketing
Tony J. Hunt	✓	✓	✓	✓	✓	✓	✓
Karen A. Dawes	✓	✓	✓		✓		✓
Nicolas M. Barthelemy	✓	✓		✓	✓	✓	✓
Carrie Eglinton Manner	✓	✓		✓	✓	✓	✓
Konstantin Konstantinov, Ph.D.		✓		✓		✓	
Martin Madaus, D.V.M., Ph.D.	✓	✓		✓	✓	✓	✓
Rohin Mhatre, Ph.D.		✓		✓		✓	
Glenn P. Muir	✓	✓	✓		✓		

AGE DISTRIBUTION



TENURE DISTRIBUTION



Board Diversity Matrix

Total Number of Directors	8			
	Female	Male	Non-Binary	Did Not Disclose Gender
Directors	2	6	—	—
Number of Directors who self-identify in any of the categories below:				
African American or Black	—	—	—	—
Alaskan Native or Native American	—	—	—	—
Asian	—	1	—	—
Hispanic or Latinx	—	—	—	—
Native Hawaiian or Pacific Islander	—	—	—	—
White	2	5	—	—
Two or More Races or Ethnicities	—	—	—	—
LGBTQ+			—	
Did not Disclose Demographic Background			—	
Supplemental self-identification:				
Persons with Disabilities			—	
Military Veteran			—	

CORPORATE GOVERNANCE HIGHLIGHTS

Repligen is committed to implementing and maintaining effective corporate governance practices that further long-term shareholder value, promote the Board’s accountability, and align the interests of our executive team with those of our shareholders. The following represent the key elements of our corporate governance programs:

Director Independence	<ul style="list-style-type: none"> • All of our director nominees, other than our President and Chief Executive Officer (“CEO”), are independent • 37.5% of our director nominees represent gender and ethnic diversity • All Committee members are independent • Executive sessions of independent directors are held at each Board meeting
Board Refreshment	<ul style="list-style-type: none"> • Board refreshment is a key area of focus as shown by the 2022 addition of Dr. Konstantinov, a bioprocessing technical expert, and the 2023 addition of Dr. Madaus, a former CEO of a major bioprocessing tools company
Board Governance Practices	<ul style="list-style-type: none"> • We conduct annual Board and committee evaluations and self-assessments • All directors and officers are subject to our Code of Business Conduct & Ethics • All directors serving on the Board attended 100% of Board and committee meetings held during the period for which they have been directors and/or on the committees of the Board • Our Chairperson and CEO positions are separate and our current Chairperson is female
Shareholder Rights	<ul style="list-style-type: none"> • All of our directors are elected annually • In uncontested elections, our directors must be elected by a majority of votes cast • Our By-laws include shareholder rights to amend our By-laws • We have no super-majority voting requirements in our Charter or By-laws • Robust investor communication program including Environmental, Social, and Governance (“ESG”)-focused outreach
Compensation Practices/Policies	<ul style="list-style-type: none"> • We have stock ownership guidelines for all directors and NEOs • Our executive compensation program links pay with corporate and individual performance • A significant percentage of target compensation is “at-risk” through short-term and long-term incentive awards • We have anti-hedging, anti-pledging and anti-short sale policies • We have a compensation clawback policy

SHAREHOLDER ENGAGEMENT

We actively seek and highly value the views and insights of our shareholders. We meet regularly with our shareholders through a robust schedule of investor meetings, conferences, roadshows and other events. In addition to our traditional investor relations outreach efforts over the last several years, we have also expanded our shareholder engagement program to include meetings with shareholder stewardship and proxy governance teams specifically, to discuss proxy proposals, overall governance and executive compensation programs, and ESG reporting and initiatives. These discussions often involve our Board Chairperson and/or Board committee members, our CEO, members of our executive management team as appropriate, and our Global Head of Investor Relations.

Our shareholder engagement program in 2022, and into 2023, was directed by our Global Head of Investor Relations, with oversight by our CEO, Tony J. Hunt, and our Board Chairperson, Karen A. Dawes, who also serves as Chair of our Nominating and Corporate Governance (“N&CG”) Committee. Participants included Nicolas M. Barthelemy, who serves as Chair of our Compensation Committee and is a member of our N&CG Committee, and Glenn Muir, who serves as Chair of our Audit Committee and is a member of our Compensation Committee. Several of those meetings included Mr. Hunt, as appropriate to the topics of discussion, or by request.

Our shareholder engagement activities have guided our Board meeting agendas and have led to governance enhancements that help us address the issues that matter most to our shareholders. We consider this ongoing engagement process important in creating long-term value, and maintaining a culture of integrity, compliance and sustainability.

Conversations with institutional investors in 2022 and into 2023 covered a wide range of topics, primarily focused on the following: our near-term financial performance and long-term financial goals; our business strategies and execution; our investments in capacity to meet customer demand; our plans for managing declines in revenue related to COVID-19; our competitive and market positioning; the durability of headwinds such as industry stocking and supply challenges and currency fluctuations; and growth drivers for the Company including new applications of our technologies. Our ESG-specific

discussions were primarily focused on the environmental and social categories, having previously focused more on governance items and responded, for example, with updates to our executive compensation performance metrics and structure (see our 2022 Proxy Statement – “*What We Heard, How We Responded*” tables). More specific to our ESG discussions in 2022 and into 2023, the primary topics were: where and how the Company is positively impacting energy consumption; the status of single-use recycling programs; actions being taken to support and advance our human capital; and steps taken to advance Diversity, Equity, and Inclusion (“DE&I”) initiatives and tracking.

ENVIRONMENTAL, SOCIAL AND GOVERNANCE MATTERS

We believe our commitment to ESG matters at all of our global facilities is an important part of creating long-term business value for all stakeholders. We are strongly committed to corporate responsibility and transparency, and we continue to factor sustainability into our business decisions and operations.

ESG Oversight

The Chair of our N&CG Committee oversees ESG matters and practices, as set forth in the N&CG Committee charter. The N&CG Committee reports to the full Board on ESG matters and the Company’s progress on sustainability initiatives. In preparation of our initial sustainability report, published in November 2021, we established an internal Corporate Responsibility Team (“CRT”), comprised of senior leaders across multiple disciplines including sustainability, business operations, human resources, investor relations, legal affairs and corporate compliance, supply chain management and engineering. In addition, we have identified an ESG ambassador at each of our sites around the globe, who takes responsibility for site-level input and data. At least on a quarterly basis, a CRT representative and the N&CG Committee Chair meet to review progress against the Company’s ESG objectives and, on an annual basis, an ESG status update is presented to the full Board. Our commitment to ESG oversight at both the Board and management levels reflects the importance of ESG-driven policies and programs to our long-term strategic plan.

Compensation-Related ESG Measures

In light of input from our stakeholders, the N&CG Committee has discussed the inclusion of an ESG metric as part of short-term and/or long-term incentive awards made to our NEOs. Beginning in 2022, the N&CG Committee determined that NEOs will annually be assigned certain ESG responsibilities, as appropriate to their roles, to support and advance defined corporate ESG goals. Their level of effectiveness in helping to achieve the corporate ESG goals is considered when determining individual achievement.

For the year 2022, the corporate ESG goals, all of which were achieved, are listed below:

- Increase the number of key sites that have transitioned to 100% renewable electricity
- Advance additional right-sized packaging programs that reduce the number, size and weight of shipments
- Pilot/explore a single-use product recycling/repurpose program
- Advance a comprehensive DE&I program

For the year 2023, the corporate ESG goals include the following:

- Reduce carbon emissions by 10%
- Implement in-process manufacturing waste recycling and landfill mitigation programs across our sites
- Create pathways for post-consumer use product recycling
- Drive employee engagement; act upon employee survey results and further expand professional development programs
- Expand employee resource group support and community outreach programs

United Nations Global Compact Communications on Progress

In establishing a formal approach to ESG in 2020, we completed a materiality assessment to glean insights from internal and external stakeholders, and joined the United Nations Global Compact (“UNGC”) in support of its Ten Principles related to human rights, labor, the environment, and anti-corruption. We committed to providing the UNGC with a periodic communication on progress. We believe our ESG reporting and alliances demonstrate our high ambition, and the actions we have taken to advance our ESG strategy demonstrate our longer-term commitment to being a responsible global corporate citizen.

Our initial sustainability report, “*Committed to Making a Difference*” is built on four pillars: Principles, People, Product and Planet (“4Ps”). Our “4Ps” embody the belief shared by our Board and the executive leadership team that corporate responsibility is essential to sustaining business and economic growth in a manner that can also deliver positive environmental and social impact. At Repligen, we are embracing sustainability as a mindset that encompasses and enhances our ESG profile.

ESG Progress in 2022

In 2022, our ESG initiatives took on fresh energy and momentum, as we hired three full-time employees focused on sustainability, and established an employee resource group (“ERG”) to support employee-driven activities. Our ESG ambassadors at each site continue to populate our financial grade ESG reporting software, enabling more robust analyses across critical ESG metrics.

During 2022, we were pleased to be upgraded to “AA” by MSCI ESG Ratings, from our previous rating of “BBB”. We also received honors from Corporate Register for our 2020 sustainability report, and importantly, we completed a second communication on progress to the UNGC. We were recognized by the UNGC with the prestigious “2022 SDG Pioneer Award, USA Network” for exceptional work toward advancing global goals, through implementation of UNGC’s Ten Principles and integration of Sustainable Development Goals (“SDGs”) into our strategy and daily business activities. We are now preparing our next report, for publication during the second half of 2023. We plan to again report disclosures in accordance with the Sustainability Accounting Standards Board (“SASB”) standards and Global Reporting Initiative (“GRI”) standards, and we also plan to include Task Force on Climate-Related Disclosures (“TCFD”) and Carbon Disclosure Project (“CDP”) disclosures.

In our next report, we expect to disclose more about our ESG targets and where we have made meaningful progress, for example: our transition to 100% renewable electricity at additional key sites; the diversion of waste streams from landfills to recyclers; steps forward on a single-use recycling pilot program; outcomes from our most recent employee engagement survey; advances in our DE&I initiatives; and more.

EXECUTIVE COMPENSATION HIGHLIGHTS

Repligen’s compensation philosophy is to provide compensation that will attract and retain high-performing talent in our industry, motivate the Company’s executive officers to create long-term, enhanced shareholder value, provide a fair reward for robust effort and stimulate our executive officers’ professional and personal growth. The Company believes that the compensation of its executive officers should align the executive officers’ interests with those of the shareholders and focus executive officer behavior not only on the achievement of near-term corporate goals, but also on the achievement of long-term business objectives and strategies. For more on compensation philosophy see the section titled “*Executive Compensation*” on page 42.

Compensation Practices

The following features of our compensation program are designed to align the interests of our executive team with those of our shareholders and with market best practices:

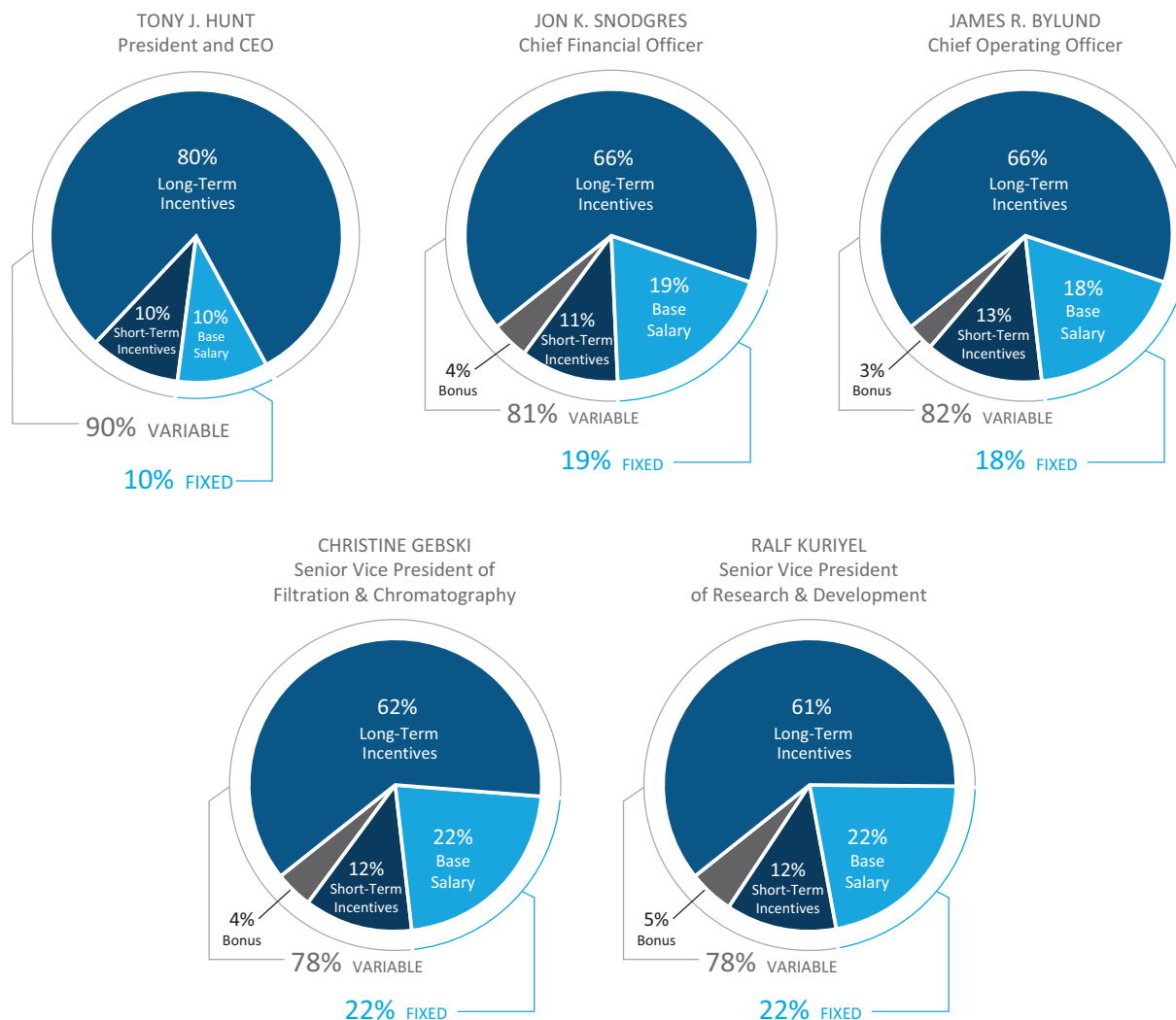
We Do	We Don't
<p>✓ Pay for Performance: We emphasize performance-based compensation that aligns the interests of our executives with those of our shareholders through the use of both near-term cash incentive compensation and longer-term equity awards subject to both time- and performance-based vesting.</p>	<p>X Hedge or Pledge: We do not allow executive officers to engage in hedging or pledging of our securities.</p>
<p>✓ Benchmark: We maintain an industry-specific peer group for annual benchmarking of executive compensation. This benchmarking is a key factor among those used to determine appropriate compensation for our NEOs.</p>	<p>X Re-Pricing: We do not allow for re-pricing of underwater stock options without shareholder approval.</p>
<p>✓ Benefits: We offer market-competitive benefits for executives that are consistent with the benefits we offer to all employees.</p>	<p>X Gross Up Payments: We do not provide tax gross-up payments for our executive officers.</p>
<p>✓ Consult: We consistently engage an independent compensation consultant to advise on compensation levels and practices.</p>	<p>X Excess Perquisites: We do not provide excessive perquisites to our employees.</p>
<p>✓ Risk Assessment: We perform an annual compensation risk assessment.</p>	<p>X Executive Retirement Benefits: We do not provide supplemental executive retirement plans, nonqualified defined contribution or deferred compensation plans to our executive officers.</p>
<p>✓ Stock Ownership Requirements: We maintain stock ownership guidelines that require our directors, our CEO and our other NEOs to maintain a specified level of ownership in the Company.</p>	<p>X Guaranteed Bonuses: We do not provide guaranteed bonuses to our executive officers.</p>
<p>✓ Clawback: We have a clawback policy and may claw back all or a portion of cash and equity incentive compensation paid to NEOs in the event of a financial accounting restatement. In light of the SEC's adoption of final clawback rules in October 2022, we intend to update our clawback policy to comply with applicable Nasdaq listing rules when effective.</p>	
<p>✓ Double Trigger: We provide each NEO severance benefits that are triggered only upon a qualifying termination of employment following a change in control (i.e., double trigger), except for a one-time special long-term equity award to the CEO⁽¹⁾.</p>	

(1) The one-time special award was granted to Mr. Hunt in 2018 in recognition of past performance and to provide additional long-term retention incentive in light of high demand for executive talent within our industry, and was overall designed to protect shareholder interests.

Compensation Earned

The graphs below reflect the allocation of salary, cash incentive compensation and equity incentive compensation earned by the Company’s Chief Executive Officer (“CEO”), Chief Financial Officer, Chief Operating Officer, Senior Vice President of Filtration & Chromatography, and Senior Vice President of Research & Development in 2022, all five of whom were serving as the Company’s NEOs as of December 31, 2022. Additional NEO compensation detail and notes can be found in the “Executive Compensation Tables - 2022 Summary Compensation Table” on page 48.

2022 Summary Compensation Allocations



The following table sets forth the total compensation earned by the NEOs during 2022. For more information on the total compensation see “Executive Compensation Tables - 2022 Summary Compensation Table” on page 48.

	Tony J. Hunt	Jon K. Snodgres	James R. Bylund	Christine GebSKI	Ralf Kuriyel
Title	President & CEO	Chief Financial Officer	Chief Operating Officer	Senior Vice President of Filtration & Chromatography	Senior Vice President of Research & Development
Total 2022 Compensation	\$7,713,930	\$2,426,541	\$2,378,323	\$1,639,616	\$1,676,334

Long-term Equity Incentive Breakout for NEOs

We believe that the mix of time-based and performance-based equity awards under our long-term incentive compensation program provides balance to the program, motivates our executives to drive organizational achievement of our near- and long-term corporate goals and aligns the interests of our executive officers with those of our shareholders.

As shown in the graph below, the target split of the long-term equity incentive compensation awards made to our NEOs based upon dollar value is 25% PSUs, 25% stock options subject to time-based vesting and 50% restricted stock units (“RSUs”) subject to time-based vesting. Our Compensation Committee annually reviews our long-term equity incentive program and has determined that the current composition and weightings remain appropriate in furthering our objective of recruiting and retaining top talent in our industry at this time.

PSU awards are earned only if we achieve three-year Adjusted Return on Invested Capital (“Adjusted ROIC”) and specific three-year revenue growth goals, which are set at challenging levels. The revenue growth goals are either based on compound annual growth rate (“CAGR”) or average annual growth rate. The Compensation Committee set sequentially more aggressive three-year Adjusted ROIC and revenue growth goals for the 2020, 2021 and 2022 PSU awards. The revenue goals for the 2020 program reflect overall revenue growth, with the exception of revenues from acquisitions after May 31, 2019. The revenue goals for the 2021 program reflect three-year average organic revenue growth for the total business. For the 2022 and 2023 programs the Compensation Committee set the revenue targets for these programs based on organic growth in base business (“Base Organic Growth”), excluding revenue related to COVID-19 from the programs due to the volatility in demand related to COVID-19 and associated revenues. Base Organic Growth excludes the impact of revenue related to COVID-19, inorganic acquisition-related revenue, and the impact of changes in foreign exchange rates.

In 2020, we granted PSU awards subject to a three-year performance period ending December 31, 2022. The following table presents the performance goals and actual achievement for the 2020 program:

Goals and Achievement for the Three-Year Performance Period Ending December 31, 2022		
	High End of Target Range	Achievement
Revenue CAGR 2020-2022	25.0%	39.2%
Adjusted ROIC ⁽¹⁾	8.0%	12.9%

(1) **Adjusted ROIC** means the Company’s Adjusted NOPAT (as defined below), divided by Adjusted Invested Capital.

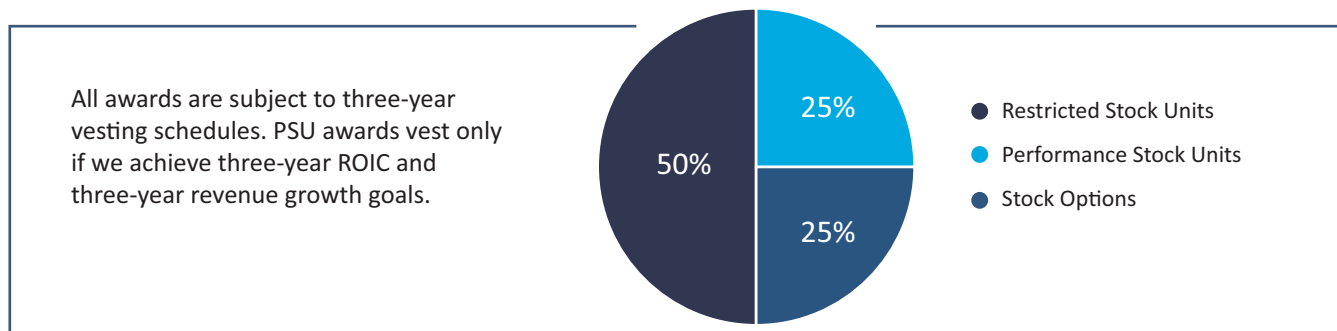
Adjusted NOPAT means the Company’s Adjusted Income from Operations multiplied by the Adjusted Tax Rate.

Adjusted Income from Operations means the Company’s income from operations under U.S. generally accepted accounting principles (“GAAP”), adjusted for inventory step-up charges, acquisition and integration costs, contingent consideration expense and intangible asset amortization.

Adjusted Tax Rate means the Company’s tax rate under GAAP, adjusted for the tax effect of non-GAAP charges.

Adjusted Invested Capital means the average of the year-end balances for the final two years of the ROIC performance period of (a) the sum of (i) the Company’s total stockholders’ equity under GAAP and (ii) the Company’s total short-term and long-term debt recorded under GAAP, less (b) the Company’s cash and cash equivalents under GAAP, but excluding in all cases the impact of any business acquisition after the first two acquisitions completed during the plan period.

We have granted our NEOs performance-based equity awards, including PSUs, each year since 2019 and we anticipate that we will continue to include such equity awards as part of our long-term incentive compensation program going forward for the reasons noted above.



BUSINESS & FINANCIAL HIGHLIGHTS 2022

We achieved our business and financial goals for 2022, remaining focused on base business growth and new product launches into the bioprocessing market, where we serve the needs of biopharmaceutical developers, contract development and manufacturing organizations and other life sciences tools companies. We are proud to offer our customers highly differentiated technologies and systems that are suited to the complexities and pressure of modern biopharmaceutical manufacturing, enabling efficiencies in the production of biologics such as monoclonal antibodies (“mAbs”), recombinant proteins, mRNA vaccines and therapeutics, and cell and gene therapies (“C>”). We operate true to our vision of “inspiring advances in bioprocessing.”

2022 Business Highlights

- We continued our track record of innovation, launching 10 new products through our research and development (“R&D”) programs.
- We grew C> revenue by over 50%, expanding our presence in this important and growing market.
- We signed strategic partnerships with DRS Daylight Solutions, Inc. (“Daylight”) and PuroLite (an Ecolab company), respectively expanding and strengthening our advanced analytics platform and our Proteins franchise.
- We integrated our fluid management acquisitions, and completed the build-out of our first fluid management assembly center in Hopkinton, Massachusetts.
- We completed capacity expansion projects at three sites, strengthening our overall business continuity capabilities for our expanding customer base.
- We advanced our ESG initiatives, particularly in the areas of renewable electricity implementation, wastewater and recycling, and DE&I programs.

2022 Financial Highlights

Overall Revenue Growth and Key Drivers of Revenue Growth

- **Revenue** increased to \$801.5 million, representing reported revenue growth of 20%, which includes five percentage points of foreign exchange headwind.
- **Base** business performance was exceptionally strong, contributing approximately \$642 million to full year revenue, and representing 34% year-over-year growth, which includes five percentage points of foreign exchange headwind.
- **Inorganic M&A** contributed approximately \$18 million to 2022 revenues.
- Revenue from programs related to **COVID-19** contributed approximately \$141 million, a decrease of approximately \$49 million from 2021, and representing 18% of overall revenue in 2022.
- We continued to build business with **C>** customers, finishing the year with over 350 active accounts, including over 20 accounts that each generated more than \$1 million in revenues. Overall sales to C> accounts increased by over 50% to approximately \$115 million, or 14% of overall revenue.
- We also made inroads in **mRNA** markets, building off the success we had in mRNA-based COVID-19 vaccine manufacturing.
- We generated **free cash flow** of \$83.7 million and reported cash, cash equivalents and short-term investments of \$623.8 million as of December 31, 2022.

Revenue Growth by Franchise

- In 2022, the majority of our franchises delivered strong revenue growth year-over-year:
 - **Filtration** revenue increased 23% as reported, to approximately \$496 million. This includes six percentage points of foreign exchange headwind. While overall Filtration sales decreased toward year end, as revenue related to COVID-19 tapered off, the base Filtration business remained robust. Our XCell® ATF systems had a strong year, driven by success in commercial processes and we saw traction with new ARTeSYN® systems that were launched during the year. A highlight of the year was our launch in the fourth quarter of the KrosFlo® RS 20 system for gene therapy and mRNA applications.

- **Chromatography** revenue increased by 45% as reported, to approximately \$132 million. This includes six percentage points of foreign exchange headwind. Growth was driven by increased demand for OPUS® pre-packed columns as resin availability improved in the second half of 2022, and as orders picked up significantly at C> accounts.
- **Proteins** revenue decreased by 8% as reported to approximately \$114 million. This includes six percentage points of foreign exchange headwind. The decrease in Proteins revenue reflects the anticipated ramp down of Protein A ligand demand from Cytiva. Over half of the decrease in revenue from sales to Cytiva was offset by increased demand for our next generation (“NGL”) ligands, which we supply to Purolite, and from Avitide, Inc. (“Avitide”) revenue, as we continue to strengthen our proteins portfolio.
- **Process Analytics** revenue increased by 11% as reported, to approximately \$54 million. This includes less than one percentage point of foreign exchange headwind. The pipeline of opportunities for this franchise expanded toward year end, as we launched our new KrosFlo® KR2i RPM™ system.

Capital Investments

- **Capital expenditures** increased to approximately \$88 million in 2022, the great majority of which was invested in manufacturing capacity expansion projects to provide business continuity and address our expectations for increased demand as we continue to grow. The focus in 2022 was on building out our hollow fiber filtration, flat sheet filtration and filtration systems manufacturing sites in Rancho Dominguez, California and Marlborough, Massachusetts. We also completed the build out and validation of our fluid management assemblies facility in Hopkinton, Massachusetts. Other smaller but important capital investments were related to our proteins and fluid management components business, and the next phase of our global SAP implementation programs.

R&D and New Product Launches

- We continued to invest in R&D, with approximately 5% of revenue reinvested into new product development.
- In 2022, we launched several innovative new products across all of our franchises, including:
 - **Filtration:** We launched our KrosFlo RS 20 series of systems, focusing their use in mRNA and C> applications, where they are used primarily in downstream applications. We also launched three ARTeSYN standardized, configurable tangential flow filtration systems.
 - **Chromatography:** We optimized ARTeSYN custom systems to deliver on a portfolio of standardized, configurable ARTeSYN chromatography systems.
 - **Proteins:** We launched three advanced affinity chromatography resins for use in gene therapy manufacturing workflows. The AVIPure® resins were developed by Avitide, which we acquired in 2021, and are specific to the major adeno-associated virus vectors used today. We also developed and launched AVIPure CH1, a cross-linked agarose-based resin specifically engineered for mAb fragment purification.
 - **Process Analytics:** We completed development of the KrosFlo KR2i RPM, a hollow fiber system with integrated FlowVPX® process monitoring and measurement technology. This exciting platform, where RPM stands for Real Time Process Management, gives customers the ability to measure, monitor and control drug concentration, not only in real time, but also in a fully automated way.

Strategic Partnerships

- We entered into a 15-year license agreement with Daylight in September 2022. Pursuant to this agreement we obtained the exclusive right to use Daylight’s Quantum Cascade Laser (“QCL”) technology, including its Culpeo® QCL-IR Liquid Analyzer (“Culpeo”) specifically in the field of bioprocessing. Our in-licensing of these rights to Culpeo complements our existing Process Analytics franchise. We believe this partnership will serve to accelerate and expand adoption of off-line and in-line process monitoring in the bioprocessing industry.
- We extended our existing supply agreement with Purolite through 2032, and expanded our partnership to include new ligands developed by Avitide for the mAb and mAb fragment market. The Purolite resin products that combine our NGL-Impact® ligands with Purolite’s Jetted bead technology continue to do well in the marketplace.
- We successfully completed the integrations of Polymem S.A. (“Polymem”), Avitide, and both Bioflex Solutions LLC and Newton T&M Corp. (collectively, “BioFlex”) into the Company in 2022, strengthening our Filtration and Proteins franchises as well as further integrating fluid management components and assemblies.

We grew our business on a year-over-year basis across many metrics, including those exhibited below:



+20%

Revenue
Growth



+34%

Base
Revenue Growth



+34%

Operating Income
[GAAP]



+45%

Earnings Per Share,
Fully Diluted [GAAP]



>50%

C>
Revenue

SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS, DIRECTORS AND MANAGEMENT

The following table sets forth certain information regarding beneficial ownership of shares of Repligen’s common stock with a par value of \$0.01 (“Common Stock”) as of March 20, 2023 by: (i) each person who is known by the Company to beneficially own more than 5% of the outstanding shares of Common Stock; (ii) each director or nominee of the Company; (iii) each named executive officer (“NEO”) of the Company; and (iv) all directors, nominees and executive officers of Repligen as a group. The business address of each director and executive officer is Repligen Corporation, 41 Seyon Street, Building #1, Suite 100, Waltham, Massachusetts 02453.

Beneficial Owner	Amount and Nature of Beneficial Ownerships ⁽¹⁾	Percent of Class ⁽²⁾
BlackRock, Inc ⁽³⁾	6,123,594	11.0%
The Vanguard Group ⁽⁴⁾	5,205,155	9.4%
T. Rowe Price Associates, Inc ⁽⁵⁾	5,070,657	9.1%
Entities Associated with the Estate of Roy T. Eddleman ⁽⁶⁾	3,500,000	6.3%
Tony J. Hunt ⁽⁷⁾	344,200	*
Jon K. Snodgres ⁽⁸⁾	48,322	*
James Bylund ⁽⁹⁾	11,540	*
Christine GebSKI ⁽¹⁰⁾	27,321	*
Ralf KuriyeI ⁽¹¹⁾	20,927	*
Karen A. Dawes ⁽¹²⁾	96,220	*
Nicolas M. Barthelemy ⁽¹³⁾	4,530	*
Carrie Eglinton Manner ⁽¹⁴⁾	7,607	*
Konstantin Konstantinov, Ph.D. ⁽¹⁵⁾	1,832	*
Martin Madaus, D.V.M., Ph.D. ⁽¹⁶⁾	350	*
Rohin Mhatre, Ph.D. ⁽¹⁷⁾	9,182	*
Glenn P. Muir ⁽¹⁸⁾	45,843	*
All directors, nominees and executive officers as a group (12 Persons) ⁽¹⁹⁾	617,874	1.1%

* Less than one percent

- (1) Beneficial ownership, as such term is used herein, is determined in accordance with Rule 13d-3 promulgated under the Securities Exchange Act of 1934 as amended (the “Exchange Act”), and includes voting and/or investment power with respect to shares of Common Stock of Repligen. Unless otherwise indicated, the named person possesses sole voting and investment power with respect to the shares. The shares shown include shares that such person has the right to acquire within 60 days of March 20, 2023.
- (2) Percentages of ownership are based upon 55,644,246 shares of Common Stock issued and outstanding as of March 20, 2023. Shares of Common Stock that may be acquired pursuant to options that are exercisable or RSUs that will vest within 60 days of March 20, 2023 are deemed outstanding for computing the percentage ownership of the person holding such options or RSUs but are not deemed outstanding for the percentage ownership of any other person.
- (3) Based solely on a Schedule 13G/A filed on January 23, 2023 for the December 31, 2022 filing event. BlackRock, Inc.’s business address is 55 East 52nd Street, New York, NY 10055. BlackRock, Inc. has sole voting power with respect to 5,859,890 shares and sole dispositive power with respect to 6,123,594 shares.
- (4) Based solely on a Schedule 13G/A filed on February 9, 2023 for the December 31, 2022 filing event. The Vanguard Group’s business address is 100 Vanguard Blvd., Malvern, PA 19355. The Vanguard Group has sole voting power with respect to 33,847 shares, shared dispositive power with respect to 73,909 shares and sole dispositive power with respect to 5,131,246 shares.
- (5) Based solely on a Schedule 13G/A filed on February 14, 2023 for the December 31, 2022, filing event. T. Rowe Price Associates, Inc. business address is 100 E. Pratt Street, Baltimore, MD 21202. T. Rowe Price Associates, Inc. has sole voting power with respect to 881,136 shares and sole dispositive power with respect to 5,070,657 shares.

- (6) Based solely on a Schedule 13G/A filed on February 15, 2023 for the December 31, 2022 filing event. Consists of (i) 2,705,689 shares held by Roy T. Eddleman Living Trust, (ii) 509,318 shares held by Roy T. Eddleman Charitable Remainder Trust #1, and (iii) 284,993 shares held by Roy T. Eddleman Charitable Remainder Trust #2 (collectively, the "Eddleman Trusts"). Nereyda Rubio and Anis Garci serve as co-trustees of the Eddleman Trusts, and each has investment and voting control over the shares held by the Eddleman Trusts (the "Shares") and may be deemed to have shared voting power and shared investment power with respect to all such Shares. The business address of each of the Eddleman Trusts is c/o TroyGould PC, 1801 Century Park East, 16th Floor, Los Angeles, CA 90067.
- (7) Includes 247,946 shares issuable pursuant to stock options which are exercisable within 60 days of March 20, 2023.
- (8) Includes 19,779 shares issuable pursuant to stock options which are exercisable within 60 days of March 20, 2023 and 1,600 RSUs which will vest within 60 days of March 20, 2023.
- (9) Includes 6,792 shares issuable pursuant to stock options which are exercisable within 60 days of March 20, 2023 and 1,000 RSUs which will vest within 60 days of March 20, 2023.
- (10) Includes 2,219 shares issuable pursuant to stock options which are exercisable within 60 days of March 20, 2023 and 1,000 RSUs which will vest within 60 days of March 20, 2023.
- (11) Includes 3,709 shares issuable pursuant to stock options which are exercisable within 60 days of March 20, 2023 and 1,600 RSUs which will vest within 60 days of March 20, 2023.
- (12) Includes 19,819 shares issuable pursuant to stock options which are exercisable within 60 days of March 20, 2023 and 644 RSUs which will vest within 60 days of March 20, 2023.
- (13) Includes 2,449 shares issuable pursuant to stock options which are exercisable within 60 days of March 20, 2023 and 534 RSUs which will vest within 60 days of March 20, 2023.
- (14) Includes 5,501 shares issuable pursuant to stock options which are exercisable within 60 days of March 20, 2023 and 1,024 RSUs which will vest within 60 days of March 20, 2023.
- (15) Includes 1,298 shares issuable pursuant to stock options which are exercisable within 60 days of March 20, 2023 and 534 RSUs which will vest within 60 days of March 20, 2023.
- (16) Includes 239 shares issuable pursuant to stock options which are exercisable within 60 days of March 20, 2023 and 111 RSUs which will vest within 60 days of March 20, 2023.
- (17) Includes 7,523 shares issuable pursuant to stock options which are exercisable within 60 days of March 20, 2023 and 1,202 RSUs which will vest within 60 days of March 20, 2023.
- (18) Includes 38,947 shares issuable pursuant to stock options which are exercisable within 60 days of March 20, 2023 and 534 RSUs which will vest within 60 days of March 20, 2023.
- (19) See footnotes 7 through 18 above. Includes 356,221 shares issuable pursuant to stock options which are exercisable within 60 days of March 20, 2023 and 9,783 RSUs which will vest within 60 days of March 20, 2023.

PROPOSAL 1

ELECTION OF DIRECTORS

DIRECTOR NOMINEES

There are eight (8) nominees for director, all of whom are current directors of Repligen that have been nominated by the Nominating and Corporate Governance (“N&CG”) Committee and the Board of Directors (“Board”) for re-election.

If elected, each of the director nominees will hold office until the 2024 Annual Meeting of Shareholders and until his or her successor has been duly elected and qualified, or until his or her earlier death, resignation or removal.

Nominee’s Name	Year First Elected Director	Position(s) with the Company
Tony J. Hunt	2015	President, Chief Executive Officer and Director
Karen A. Dawes	2005	Director, Chairperson of the Board
Nicolas M. Barthelemy	2014	Director
Carrie Eglinton Manner	2020	Director
Konstantin Konstantinov, Ph.D.	2022	Director
Martin D. Madaus, D.V.M., Ph.D.	2023	Director
Rohin Mhatre, Ph.D.	2020	Director
Glenn P. Muir	2015	Director

Shares represented by all proxies received by the Board and not marked or voted to abstain from voting for any individual director or for any group of directors will be voted, unless otherwise indicated, FOR the election of the nominees named above. Proxies may not be voted for a greater number of persons than the number of nominees named. The Board knows of no reason why any nominee should be unable or unwilling to serve, but if any nominee should be unable or unwilling to serve, proxies will be voted in accordance with the judgment of the persons named as attorneys-in-fact on the proxy cards with respect to the directorship for which that nominee was unable or unwilling to serve.

Proposal 1 relates solely to the election of the eight (8) above-named directors nominated by the Company and does not include any other matters relating to the election of directors, including without limitation, the election of directors nominated by any shareholders of the Company.

The Board unanimously recommends a vote FOR each of the nominees for election as directors of the Company. If authorized proxies are submitted without specifying an affirmative or negative vote on any proposal, the shares represented by such proxies will be voted in favor of the Board’s recommendations.

OCCUPATIONS OF DIRECTORS AND EXECUTIVE OFFICERS

Repligen’s executive officers are appointed by, and serve at the discretion of, the Board. Each executive officer is a full-time employee of Repligen. The current directors, including director nominees, and executive officers of Repligen as of March 20, 2023 are as follows:

Name	Age ⁽¹⁾	Position(s) with the Company
Tony J. Hunt	59	President, Chief Executive Officer and Director
Jon K. Snodgres	57	Chief Financial Officer
James R. Bylund	60	Chief Operating Officer
Christine GebSKI	55	Senior Vice President, Filtration and Chromatography
Ralf Kuriyel	65	Senior Vice President, Research and Development
Nicolas M. Barthelemy ⁽²⁾⁽³⁾	57	Director
Karen A. Dawes ⁽³⁾	71	Director, Chairperson of the Board
Carrie Eglinton Manner ⁽⁴⁾	49	Director
Konstantin Konstantinov, Ph.D. ⁽³⁾⁽⁵⁾	65	Director
Martin D. Madaus, D.V.M., Ph.D. ⁽³⁾⁽⁴⁾⁽⁶⁾	63	Director
Rohin Mhatre, Ph.D. ⁽²⁾	58	Director
Glenn P. Muir ⁽²⁾⁽⁴⁾	64	Director

(1) Age as of the date of the 2023 Annual Meeting of Shareholders (“Annual Meeting”).

(2) Member of the Compensation Committee.

(3) Member of the N&CG Committee.

(4) Member of the Audit Committee.

(5) Dr. Konstantinov was elected to the Board on May 26, 2022.

(6) Dr. Madaus was elected to the Board on February 6, 2023.

BIOGRAPHICAL INFORMATION

The following paragraphs provide information about the Company's continuing directors and executive officers. The information presented includes information about each director's specific experience, qualifications, attributes and skills that led the Board to the conclusion that he or she should serve as a director.

EXECUTIVE OFFICERS



Tony J. Hunt was named President and CEO and has served on the Board since May 2015. He joined Repligen in May 2014 as Chief Operating Officer, overseeing commercial and manufacturing operations. Before coming to Repligen, Mr. Hunt was President of Bioproduction at Life Technologies, a global life sciences company which was acquired by Thermo Fisher Scientific in 2014. He joined Life Technologies in 2008, serving as General Manager of Bioproduction Chromatography and Pharma Analytics before being named President of Bioproduction in 2011. From 2000 to 2008, Mr. Hunt was with Applied Biosystems as Senior Director of Pharma Programs where he launched the Pharma Analytics business that in 2008 became a part of the Bioproduction platform at Life Technologies. Mr. Hunt also serves on the board of directors of one publicly traded company, 908 Devices Inc. Mr. Hunt received a B.S. in Microbiology and an M.S. in Biotechnology from University College in Galway, Ireland, and an M.B.A. from Boston University School of Management. Mr. Hunt brings to the Board his deep understanding of the bioprocessing market.



Jon K. Snodgres joined Repligen in July 2014 as the Chief Financial Officer, where he oversees financial operations for the Company. Mr. Snodgres was previously with Maquet Cardiovascular ("Maquet"), a medical device company, where he served as Chief Financial Officer for five years. At Maquet, in addition to being responsible for the preparation and oversight of the company's financial statements, he was a key participant in growth planning and profit improvement strategies. Mr. Snodgres previously spent eight years with life sciences company Thermo Fisher Scientific in various roles, most recently as Vice President of Finance for the Laboratory Products Group. He began his career in finance at AlliedSignal/Honeywell International. Mr. Snodgres received a B.S. in Business Administration, Finance from Northern Arizona University.



James R. Bylund was named Chief Operating Officer of the Company in January 2022 and serves as the Company's principal operating officer. He joined Repligen in March of 2020 as Senior Vice President, Global Operations and IT, overseeing all operations and IT functions on a global basis. Between March 2019 and March 2020, Mr. Bylund also worked in real estate at Inspire Development in Austin, Texas. Prior to joining Repligen, Mr. Bylund spent ten years at Thermo Fisher Scientific in a number of roles including Vice President and General Manager of the Single Use Technologies Business Unit and Vice President of Global Operations for the Bioproduction Division. Prior to joining Thermo Fisher, Mr. Bylund also worked for Fiserv (9 years) and Eli Lilly and Company (7 years) in a variety of leadership roles. He has significant experience in managing multiple operating sites across the globe and scaling operations to meet rapidly growing demand. Mr. Bylund is a passionate proponent of continuous improvement and has consistently demonstrated the ability to assemble and grow highly effective teams. He holds a B.S. in Accounting from Utah State University and an M.B.A. from Indiana University.



Christine Gebski joined Repligen in May 2015 and currently serves as the Senior Vice President, Filtration and Chromatography where she oversees the general management and strategy of the Company's upstream and downstream filtration and chromatography portfolio. Ms. Gebski also manages the Field Applications function within the Company, ensuring strong customer experience. Prior to joining Repligen, Ms. Gebski was head of the Chromatography Business Unit within the Bioproduction Division of Thermo Fisher Scientific. At Thermo Fisher she managed the Global Process Chromatography Applications and R&D functions for ten years. Before joining Thermo Fisher Scientific, Ms. Gebski was a Process Development Scientist for 15 years in the biotechnology industry, having held positions of increasing responsibility at Genzyme, TKT/Shire and EMD Pharmaceuticals. She has significant experience in downstream process development and engineering, technology transfer and validation across a variety of biological molecule classes and diagnostic reagents. She holds a B.S. in Biology from the University of Vermont and a M.S. in Biotechnology from the University of Massachusetts at Lowell.



Ralf Kuriyel joined Repligen in October 2016 as the Senior Vice President, Research and Development where he oversees the Company's R&D efforts. Mr. Kuriyel was previously Vice President of Applications for the single-use business unit within the Life Sciences division of Pall Corporation ("Pall"), whose acquisition by Danaher Corporation was completed in August 2015. At Pall, Mr. Kuriyel served as Vice President of R&D, Field Applications and Process Development Services from November 2014 to October 2016. In addition, Mr. Kuriyel served as Vice President, Applications R&D at Pall from November 2011 to November 2014. Mr. Kuriyel received a B.S. and an M.S. in Chemical Engineering from Rensselaer Polytechnic Institute and has completed

his coursework for the Tufts University Ph.D. program in Chemical Engineering. He is an inventor of multiple patents and has co-authored over 30 scientific publications on bioprocessing, including separations technologies, membrane separations methods, protein processing and enhanced microfiltration techniques.

DIRECTORS



Nicolas M. Barthelemy has served as a director of Repligen since June 2014. Mr. Barthelemy brings over 30 years of industry experience to the director role. Mr. Barthelemy served as President and CEO of bioTheranostics, a molecular diagnostics company, from September 2014 until February 2017. Prior to bioTheranostics, he served as President, Global Commercial Operations at Life Technologies, which was acquired by Thermo Fisher Scientific in February 2014. Prior to Life Technologies, Mr. Barthelemy was with Biogen Inc. ("Biogen") for eight years, most recently as Vice President, Manufacturing and General Manager for the company's manufacturing organization at Research Triangle Park. He began his career with Merck & Co.,

Inc. as a Senior Project Engineer, Vaccine Technology. Mr. Barthelemy also serves on the board of directors of three privately held companies: Biocare Medical LLC, NanoCollect Biomedical, and Slingshot Biosciences. He also serves as an advisor to Warburg Pincus, a private equity firm. Mr. Barthelemy previously served as a board member of Twist Bioscience, 908 Devices Inc. and Standard BioTools, Inc. (previously Fluidigm Corporation). Mr. Barthelemy received a M.S. in Chemical Engineering from the University of California, Berkeley, and an engineering degree from Ecole Supérieure de Physique et Chimie Industrielles, Paris. Mr. Barthelemy's qualifications to sit on the Company's Board include his extensive experience in the bioprocessing field, including large scale biologics manufacturing and commercialization of consumables used in bioprocessing.



Karen A. Dawes, Chairperson of the Board, has served as a director of Repligen since September 2005. She is currently President of Knowledgeable Decisions, LLC, a management consulting firm. Ms. Dawes served from 1999 to 2003 as Senior Vice President and U.S. Business Group Head for Bayer Corporation's U.S. Pharmaceuticals Group. Prior to joining Bayer, she was Senior Vice President, Global Strategic Marketing, at Wyeth LLC ("Wyeth"), a pharmaceutical company (formerly known as American Home Products), where she held responsibility for worldwide strategic marketing. Ms. Dawes also served as Vice President, Commercial Operations for Genetics Institute, Inc., which was acquired by Wyeth in January 1997, designing and

implementing that company's initial commercialization strategy to launch BeneFIX[®] and Neumega[®]. Ms. Dawes began her pharmaceuticals industry career at Pfizer, Inc. where, from 1984 to 1994, she held a number of marketing positions, serving most recently as Vice President, Marketing of the Pratt Division. At Pfizer, she directed launches of Glucotrol[®]/Glucotrol XL[®], Zoloft[®], and Cardura[®]. Ms. Dawes also serves on the board of directors of two publicly traded companies: Vaccitech Limited and Medicenna Therapeutics Corp, one private company, JPA Health, and one not-for-profit company, Medicines 360. Ms. Dawes received a B.A. and M.A. in English from Simmons College and an M.B.A. from Harvard University Graduate School of Business. Ms. Dawes' qualifications to sit on the Company's Board include her extensive strategic experience in both a managerial and consulting capacity with pharmaceutical companies as well as her considerable commercial background.



Carrie Eglinton Manner has served as a director of Repligen since June 2020. She brings to the director role over 25 years of leadership experience across multiple disciplines. Ms. Eglinton Manner currently serves as President and CEO of OraSure Technologies, Inc. (“OraSure”), which she joined in June 2022. OraSure is a leader in the development, manufacture and distribution of rapid diagnostic tests, sample collection and stabilization devices, and molecular service solutions designed to discover and detect critical medical conditions. Prior to OraSure, Ms. Eglinton Manner served as Senior Vice President, Advanced & General Diagnostics and Clinical Solutions at Quest Diagnostics (“Quest”), which she joined in 2017. In her role at Quest, Ms. Eglinton Manner was responsible for value creation across the company’s \$10 billion clinical portfolio, driving innovation in R&D, along with partnerships and acquisitions. She helped accelerate growth in Quest’s \$2 billion Advanced Diagnostics portfolio, which included its specialty molecular and genetic offerings, along with Quest’s global and pharmaceutical services businesses. Prior to Quest, Ms. Eglinton Manner held various roles of increasing scope and responsibility over a period of 20 years at GE Healthcare. From 2009 through 2016, she served as President & CEO of four distinct GE Healthcare global businesses in the areas of diagnostic imaging, lab services and medical devices, ranging in size from approximately \$150 million to \$3 billion in revenue. In addition to the Repligen Board, Ms. Eglinton Manner serves as board director for the not-for-profit Thrive Networks, focused on advancing women and building healthy, resilient communities. Ms. Eglinton Manner holds a B.S. in Mechanical Engineering from the University of Notre Dame. Ms. Eglinton Manner’s qualifications to sit on the Company’s Board include her track record of delivering business expansion and profitability for rapidly growing global businesses, including her experience with integrating acquisitions and building operations excellence, with a commitment to quality and process improvements.



Konstantin Konstantinov, Ph.D., has served as a director of Repligen since May 2022. He has also been a member of our Scientific Advisory Board since March 2016. Dr. Konstantinov is currently Chief Technology Officer at Codiak BioSciences (“Codiak”), where he previously served for six years as Executive Vice President, Manufacturing & Process Sciences. Before joining Codiak, Dr. Konstantinov was responsible for the late-stage bioprocess and technology development at Sanofi’s Boston Hub, including all functions, from cell banking to fill/finish/lyophilization. Prior to Sanofi, Dr. Konstantinov worked for Bayer in Berkeley, California for 14 years, advancing to the position of Head of Process Sciences. He has published 60 peer reviewed papers and has more than 15 patents and patent applications. During the last 23 years, Dr. Konstantinov has worked on the development and commercialization of various products, including monoclonal antibodies, blood factors and enzymes expressed in mammalian cells. Most recently, he has pioneered the development of an end-to-end integrated continuous biomanufacturing platform, which is becoming a strategic technological trend for the biomanufacturing industry worldwide. Dr. Konstantinov received his Ph.D. in Biochemical Engineering from Osaka University, Japan, which was followed by a post-doctoral assignment at DuPont and the University of Delaware.



Martin D. Madaus, D.V.M., Ph.D., has served as a director of Repligen since February 2023. Dr. Madaus joins the Board with over 25 years of industry experience, including five years as Chairman, President and CEO of Millipore Corporation (“Millipore”), where he was integral to the company’s transformation into a life science leader, and its acquisition by Merck KGaA (“Merck”) in 2010. He is an active board leader, currently serving two other public companies: as Lead Director for precision health technology company Quanterix Corporation and as a board member for mass cytometry player Standard BioTools, Inc. (previously Fluidigm Corporation). He also serves on the boards of three private companies: Unchained Labs, Emulate Inc. and Ultivue Inc. Dr. Madaus is currently a senior operating executive at The Carlyle Group (since 2019), a multinational private equity and asset management services company. He previously served as Chairman and CEO at Ortho-Clinical Diagnostics from 2014 to 2019. His tenure with biopharmaceutical and diagnostic industry leader Roche Holding AG (“Roche”) from 1996 to 2004 included his position from 2000 to 2004 as President and CEO, N.A. of Roche Diagnostics Corp. Dr. Madaus began his career as a veterinarian, before joining global pharmaceutical and diagnostic company Boehringer Mannheim Corporation (“Boehringer”). While at Boehringer, he held sales, marketing and product management roles from 1989 to 1996, until his move into general management coincided with the company’s acquisition by Roche in 1996. He holds a D.V.M. from the University of Munich in Germany and a Ph.D. from the University of Veterinary Medicine of Hanover in Germany. Dr. Madaus’ qualifications to sit on the Company’s Board include his extensive bioprocessing and biopharmaceutical industry experience, especially in the areas of strategy, mergers and acquisitions, and commercial operations.



Rohin Mhatre, Ph.D., was appointed to the Board in March 2020. Dr. Mhatre brings over 25 years of relevant experience to the director role, including his current position since January 2017, as Senior Vice President, Product and Technology Development at Biogen. He has held numerous other roles of increasing responsibility within Biogen, which he joined in 1996, including six years as Vice President of Biopharmaceutical Development, where he led a 300-member team responsible for cell line, cell culture, purification and device development. Earlier in Dr. Mhatre's career at Biogen, he focused on building out analytical development and technical services. Prior to Biogen, Dr. Mhatre led the purification and applications group at Applied BioSystems (formerly Perspective Biosystems). Dr. Mhatre holds a Ph.D. in Chemistry from Northeastern University. Dr. Mhatre's qualifications to sit on the Company's Board include his extensive technical expertise, his leadership abilities and his deep understanding of the dependencies between biological drug development and efficient manufacturing workflows.



Glenn P. Muir has served as a director of Repligen since October 2015. Mr. Muir brings over 30 years of experience to the director role, including 26 years with Hologic, Inc. ("Hologic"), a large multi-national medical device and diagnostics company where he most recently served as Chief Financial Officer and Executive Vice President. Mr. Muir retired in May 2014 from Hologic, where he helped steer the company's evolution from a venture-backed single product company to a publicly traded diversified organization with over 5,000 employees and \$2.5 billion in revenue. He joined Hologic in 1988 and served as Chief Financial Officer since 1992 and Executive Vice President since 2000. Prior to Hologic, Mr. Muir was with Metallon Engineered Materials Co., a private company where from 1986-1988 he held the role of Vice President, Finance. Previously, from 1981-1984, he was a Senior Auditor with Arthur Andersen & Co. Mr. Muir also serves on the board of directors of two publicly traded companies: medical technology company, Neuronetics, Inc., and life science company G1 Therapeutics, Inc., and one privately held company: medical device company Impulse Dynamics Limited. Previously, Mr. Muir served on the board of directors of ReWalk Robotics Ltd. from July 2014 to December 2017. Mr. Muir is a Certified Public Accountant (inactive since 2022) with a Bachelors of Business Administration from the University of Massachusetts, Amherst. He also earned an M.S. from Bentley University and an M.B.A. from Harvard University. Mr. Muir's qualifications to sit on Repligen's Board include his extensive experience with integrating strategic acquisitions and leading the financial operations for a global manufacturing and commercial organization.

CERTAIN RELATIONSHIPS AND RELATED PERSONS TRANSACTIONS

No family relationship exists among the officers and directors of Repligen. The Audit Committee conducts an appropriate review of all related party transactions for potential conflict of interest situations on an ongoing basis, and the approval of the Audit Committee is required for all such transactions. The term "related party transactions" shall refer to transactions required to be disclosed by the Company pursuant to Item 404 of Regulation S-K promulgated by the Securities and Exchange Commission ("SEC").

DELINQUENT SECTION 16(a) REPORTS

Under U.S. securities laws, directors, certain officers and persons holding more than 10% of our Common Stock must report their initial ownership of our Common Stock and any changes in their ownership to the SEC. The SEC has designated specific due dates for these reports and we must identify in this Proxy Statement those persons who did not file these reports when due. Based solely on our review of copies of the reports filed with the SEC and the written representations of our directors and executive officers, we believe that all reporting requirements for fiscal year 2022 were complied with by each person who at any time during the 2022 fiscal year was a director or an executive officer or held more than 10% of our Common Stock, except for the following: Due to an administrative error, a transaction for the purchase on March 16, 2022 of 625 shares on the open market by Carrie Eglinton Manner, a current member of the Board of Directors, was not initially reported. The required Form 4 for this transaction was filed on December 14, 2022.

CORPORATE GOVERNANCE AND BOARD MATTERS

BOARD INFORMATION

Director Independence

The Board of Directors (“Board”) has determined that each of the directors who has served during the fiscal year ended December 31, 2022 and each of the nominees for director at the 2023 Annual Meeting of Shareholders (“Annual Meeting”), with the exception of Mr. Hunt, has no material relationship with the Company and is independent within the meaning of the director independence standards of The Nasdaq Stock Market LLC (“Nasdaq”). Furthermore, the Board has determined that each member of the Audit Committee, the Compensation Committee and the Nominating and Corporate Governance (“N&CG”) Committee of the Board is independent within the meaning of Nasdaq’s director independence standards and that each member of the Audit Committee meets the heightened director independence standards of the Securities and Exchange Commission (“SEC”) for audit committee members.

Board Leadership Structure

The Board is led by its Chairperson, Karen Dawes, who is an independent director. The Board believes that separating the roles of CEO and Chairperson of the Board is the most appropriate structure for the Company at this time. Having an independent Chairperson ensures that the CEO is accountable for managing the Company in the best interests of the shareholders while, at the same time, acknowledging that managing the Board is a separate and time intensive responsibility. Additionally, this structure ensures a greater role for the non-management directors in the oversight of the Company and active participation of the independent directors in setting agendas and establishing priorities and procedures for the work of the Board. The Board also believes that having an independent Chairperson can serve to curb conflicts of interests, promote oversight of risk and manage the relationship between the Board and the CEO.

Executive Sessions

The Board holds executive sessions of the independent directors at each regularly scheduled Board meeting and/or as deemed necessary by the Chairperson. Executive sessions do not include any employee directors of the Company, and the Chairperson of the Board is responsible for chairing the executive sessions.

Director Nomination Policies

Director Qualifications

The N&CG Committee is responsible for selecting and recommending nominees for election as directors to the Board. The full Board participates in an annual Board effectiveness assessment, which includes evaluating the appropriate qualities, skills and characteristics of current Board members and identifying skills and qualifications desired for director nominees. These assessments include consideration of the following minimum qualifications that the N&CG Committee believes must be met by all directors:

- Directors must be of high ethical character, have no conflict of interest and share the values of the Company as reflected in the Company’s Second Amended and Restated Code of Business Conduct & Ethics;
- Directors must have reputations, both personal and professional, consistent with the image and reputation of the Company;
- Directors must have the ability to exercise sound business judgment;
- Directors must have substantial business or professional experience and be able to offer advice and guidance to the Company’s management based on that experience; and
- Directors must have (at a minimum) a bachelor’s degree or equivalent degree from an accredited college or university.

The N&CG Committee also considers numerous other qualifications, skills and characteristics when evaluating director nominees, such as:

- An understanding of and experience in bioprocessing, biotechnology and pharmaceutical industries;
- An understanding of and experience in accounting oversight and governance, finance and marketing;
- Leadership experience with public companies or other significant organizations; and
- Diversity of background, including diversity of gender, race, ethnicity, culture, nationality, sexual orientation, age, perspectives, personal and professional background, knowledge and experience.

These factors and others are considered useful by the Board and are reviewed in the context of an assessment of the perceived needs of the Board at a particular point in time.

The N&CG Committee considers candidates for Board membership, including those suggested by shareholders, applying the same criteria for all candidates. If the N&CG Committee identifies a need to replace a current member of the Board, to fill a vacancy on the Board, or to expand the size of the Board, it considers candidates from a variety of sources including third-party search firms that assist in identifying, evaluating and conducting due diligence on potential director candidates. For all potential candidates, our N&CG Committee will consider all factors it deems relevant, including those enumerated above.

Board Diversity

The N&CG Committee is committed to having a diverse Board and considers a variety of candidate attributes, including whether a candidate, if elected, assists in achieving a mix of directors who represent a diversity of backgrounds and experience. A Board that includes diversity, including diversity in gender, race, ethnicity, culture, nationality, sexual orientation, age, perspectives, personal and professional background, knowledge and experience, is important because we believe having varying perspectives and a breadth of experience improves the quality of deliberations, contributes to more effective decision-making on behalf of the Company and its shareholders and enhances the overall chemistry and collaborative culture in the boardroom. Accordingly, the N&CG Committee is committed to actively seeking out Board candidates who are highly qualified women, minorities, and individuals with other diverse backgrounds, skills and experience.

At the end of our annual meeting on May 26, 2022, 33% of our board was gender diverse. As part of our continued board refreshment efforts we have since added two directors that, together, bring a necessary and specific knowledge set to our Board, specifically in bioprocessing and biopharmaceutical operations. The N&CG is cognizant that this has reduced our gender diversity to 25%. However, as part of the N&CG Committee's commitment to achieving and maintaining a diverse Board, the N&CG Committee is continuously looking for opportunities to attain a Board composition comprised of at least 30% gender diverse directors and to continue to maintain or improve overall board ethnic and racial diversity. To that end, the N&CG is committed to identifying and evaluating qualified candidates that best serve the needs of the Company and contribute to the overall diversity of the Board to achieve the Board's 30% gender diversity objective by our 2024 Annual Meeting of Shareholders.

Process for Identifying and Evaluating Director Nominees

The Board is responsible for selecting and nominating nominees for election as directors but delegates the selection and nomination process to the N&CG committee, with the expectation that other members of the Board or members of management will take part in the process as appropriate.

Generally, the N&CG Committee identifies candidates for director nominees in consultation with Board members and management, through the use of search firms or other advisers, through the recommendations submitted by shareholders or through such other methods as the N&CG Committee deems to be helpful in identifying candidates. Consistent with historical practices and our ongoing efforts in diversity and inclusion, we target a diverse slate of candidates. Once candidates have been identified, the N&CG Committee confirms that the candidates meet all of the minimum qualifications for director nominees established by the N&CG Committee. The N&CG Committee may gather information about the candidates through interviews, questionnaires, background checks, or any other means that the N&CG Committee deems to be helpful in the evaluation process. The N&CG Committee meets as a group to discuss and evaluate the qualities and skills of each candidate, both on an individual basis and taking into account the overall composition and needs of the Board. Based on the results of the evaluation process, the N&CG Committee recommends candidates to be interviewed by other Board directors and ultimately recommends final candidates for the Board's approval as director nominees for election to the Board. The N&CG Committee also recommends candidates for the Board's appointment to the committees of the Board.

Procedures for Recommendation of Nominees by Shareholders

The N&CG Committee will consider director candidates who are recommended by the shareholders of the Company. Subject to shareholder approval of Proposal 6 of this proxy statement, ratifying the adoption of the Company's proxy access by-law adopted by the Board in 2021, shareholders who meet the applicable eligibility requirements under the proxy access provision of our by-laws and who wish to include nominees for our Board in the Company's proxy statement for the 2024 Annual Meeting of Shareholders, or shareholders who wish to make a proposal at the 2024 Annual Meeting of Shareholders (other than a proposal made pursuant to Rule 14a-8 or pursuant to the proxy access provision of our by-laws), must in each case deliver any such recommendation not later than the close of business on the 60th day, nor earlier than the close of business on the 90th day, prior to the first anniversary of the preceding year's annual meeting. Shareholders, in submitting recommendations to the N&CG Committee for director candidates, shall follow the following procedures:

Such recommendation for nomination should be in writing and include the following:

- Name and address of the shareholder making the recommendation, as they appear on the Company's books and records, and of such record holder's beneficial owner;
- The class or series and number of all shares of capital stock of the Company which are, directly or indirectly, owned beneficially or of record by such shareholder and such beneficial owner or any of its affiliates or associates;
- All synthetic equity interests in which the shareholder and such beneficial owner or any of its affiliates or associates, directly or indirectly, holds an interest, including a description of the material terms of each such synthetic equity interest;
- Name and address of the individual recommended for consideration as a director nominee;
- The principal occupation of the director nominee;
- The total number of shares of capital stock of the Company that will be voted for the director nominee by the shareholder making the recommendation;

- All other information relating to the director nominee that would be required to be disclosed in solicitations of proxies for the election of directors, or is otherwise required, in each case pursuant to Regulation 14A under the Securities Exchange Act of 1934, as amended (“Exchange Act”) (including the recommended candidate’s written consent to being named in the proxy statement as a nominee and to serving as a director if approved by the Board and elected);
- A written statement from the shareholder making the recommendation, stating why such recommended candidate would be able to fulfill the duties of a director;
- Any proxy, agreement, arrangement, understanding or relationship pursuant to which the shareholder making the recommendation has or shares a right to, directly or indirectly, vote any shares of any class or series of capital stock of the Company;
- Any rights to dividends or other distributions on the shares of any class or series of capital stock of the Company, directly or indirectly, owned beneficially by such recommending shareholder that are separated or separable from the underlying shares of the Company;
- Any performance-related fees that such recommending shareholder, directly or indirectly, is entitled to is based on any increase or decrease in the value of shares of any class or series of capital stock of the Company or any synthetic equity interest;
- Subject to shareholder approval of Proposal 6 of this proxy statement, ratifying the adoption of the Company’s proxy access by-law adopted by the Board in 2021, in the case of a nomination by proxy access, any agreement, arrangement or understanding by and among the shareholder making the recommendation or beneficial owner and any other person pertaining to the nomination;
- Subject to shareholder approval of Proposal 6 of this proxy statement, ratifying the adoption of the Company’s proxy access by-law adopted by the Board in 2021, in the case of a nomination by proxy access, the names and addresses of other shareholders known by the shareholder making the recommendation to support such nomination; and
- Subject to shareholder approval of Proposal 6 of this proxy statement, ratifying the adoption of the Company’s proxy access by-law adopted by the Board in 2021, in the case of a nomination by proxy access, a statement whether or not the shareholder giving the notice will deliver a proxy statement and form of proxy to holders of at least the percentage of voting power of all of the shares of capital stock of the Company believed by such shareholder to be sufficient to elect the nominee.

Nominations must be sent to the attention of the Corporate Secretary of the Company by one of the two methods listed below:

- By U.S. Mail (including courier or expedited delivery service):
 Repligen Corporation
 Attn: Corporate Secretary
 41 Seyon Street
 Building #1, Suite 100
 Waltham, MA 02453
- By facsimile at (781) 250-0115:
 Attn: Corporate Secretary

The Corporate Secretary of the Company will promptly forward any such nominations to the N&CG Committee. Once the N&CG Committee receives the nomination of a candidate, the candidate will be evaluated and a recommendation with respect to such candidate will be delivered to the Board. Nominations not made in accordance with the foregoing policy shall be disregarded by the N&CG Committee and votes cast for such nominees shall not be counted.

In addition to satisfying the above requirements, to comply with the SEC’s universal proxy rules, shareholders who intend to solicit proxies in support of director nominees other than the Company’s nominees must provide notice that sets forth the information required by Rule 14a-19 under the Exchange Act no later than March 19, 2024.

The Company recognizes the importance of a shareholder’s ability to nominate directors to the Company’s Board. As part of the Company’s commitment to providing a director nomination process that is fair and equitable to all nominating shareholders, the Company’s Corporate Governance Guidelines provide that the Board will not, without shareholder consent, adopt any amendments to our By-laws that would require a nominating shareholder to: (i) deliver director nominations more than 90 days prior to the first anniversary of the prior year’s annual meeting; (ii) disclose to the Company such shareholder’s plans to nominate candidates to the board of directors of other public companies, or disclose prior proposals or director nominations that such shareholder privately submitted to other public companies; or (iii) disclose information to the Company about a nominating shareholder’s limited partners or business associates.

Shareholder Communications Policies

The Board provides to every shareholder the ability to communicate with the Board, as a whole, and with individual directors on the Board through an established process for shareholder communication (as that term is defined by the rules of the SEC) as follows:

For communications directed to the Board as a whole, shareholders may send such communication to the attention of the Chairperson of the Board via one of the two methods listed below:

- By U.S. Mail (including courier or expedited delivery service):
Repligen Corporation
Attn: Chairperson of the Board of Directors
41 Seyon Street
Building #1, Suite 100
Waltham, MA 02453
- By facsimile at (781) 250-0115:
Attn: Chairperson of the Board of Directors

For shareholder communications directed to an individual director in his or her capacity as a member of the Board, shareholders may send such communications to the attention of the individual director via one of the two methods listed below:

- By U.S. Mail (including courier or expedited delivery service):
Repligen Corporation
Attn: [Name of Individual Director]
41 Seyon Street
Building #1, Suite 100
Waltham, MA 02453
- By facsimile at (781) 250-0115:
Attn: [Name of Individual Director]

The Company will forward any such shareholder communication to the Chairperson of the Board, as a representative of the Board, and/or to the director to whom the communication is addressed on a periodic basis. The Company will forward such communication by certified U.S. Mail to an address specified by each director of the Board for such purposes or by secure electronic transmission.

Director Attendance Policy

The Board's policy is that all directors and director nominees attend the Company's Annual Meeting in person, via teleconference, or via other virtual means. All members who were on the Board as of May 26, 2022 attended the 2022 Annual Meeting of Shareholders.

Stock Ownership Guidelines and Insider Trading Policy

The Board has adopted share ownership guidelines relating to ownership of the Company's securities by the Company's named executive officers ("NEOs") and non-employee directors. Subject to the terms of the policy, (i) the CEO is required to acquire over a five-year period and hold shares of Common Stock of the Company equal to five times his or her base salary as of a specified measuring date, (ii) each of the Company's NEOs is required to acquire over a five-year period and hold shares of Common Stock of the Company equal to one times his or her base salary as of a specified measuring date, and (iii) each of the Company's non-employee directors is required to acquire over a five-year period and hold shares of Common Stock of the Company equal to four times the Company's annual cash retainer paid to each such non-employee director. Restricted stock and RSUs (whether or not vested as of the measurement date) are included in the number of shares owned, but unexercised stock options (regardless of whether they are vested or unvested) and PSUs are not included in the total number of shares owned by the NEOs or directors for purposes of the share ownership policy.

Under the Company's insider trading policy, employees, including executive officers and non-employee directors, are not permitted to engage in the following transactions with respect to the Company's stock: selling any of the Company's securities that are not owned by such insider at the time of sale ("short selling") and holding the Company's stock in an account that is, or is linked to, a margin account. In addition, the following transactions are not permitted without preapproval of the Company's Audit Committee: buying or selling puts, calls or other derivatives of the Company's securities or any derivative securities that provide the economic equivalent of ownership of any of the Company's securities; engaging in any hedging transaction with respect to the Company's securities; or pledging Company securities as collateral for a loan. Gifts (transfer of the Company's stock without consideration) are subject to the same restrictions as all other trades and are prohibited during a period when the insider is not permitted to trade.

Code of Business Conduct & Ethics

Repligen has adopted a Second Amended and Restated Code of Business Conduct & Ethics as its "code of ethics" as defined by regulations promulgated under the Securities Act of 1933, as amended (the "Securities Act"), and the Exchange Act (and in accordance

with the Nasdaq requirements for a “code of conduct”), which applies to all of the Company’s directors, officers and employees, including its principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions. A current copy of the Code of Business Conduct & Ethics is available at the “Investors” — “Corporate Governance” — “Policies and Charters” section of the Company’s website at <http://www.repligen.com>. A copy of the Code of Business Conduct & Ethics may also be obtained free of charge from the Company upon a request directed to Repligen Corporation, Attention: Investor Relations, 41 Seyon Street, Building #1, Suite 100, Waltham, MA 02453. The Company will promptly disclose any substantive changes in or waivers, along with reasons for the waivers, of the Code of Business Conduct & Ethics granted to its executive officers, including its principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions, and its directors by posting such information on its website at www.repligen.com under “Investors” — “Corporate Governance.”

The Board’s Role in Risk Oversight

The Company’s management is responsible for assessing and managing risk and the Board oversees and reviews the Company’s risk management process. This oversight by the Board is primarily accomplished through its committees and through management’s reporting processes, including having the Board receive regular reports from members of senior management on areas of material risk to the Company, including operational, financial, legal and regulatory, strategic, and governance risks. In addition, at the beginning of each Board meeting, the CEO provides a status update on the Company and addresses any areas of risk in an executive session.

The committees of the Board execute their oversight responsibility for risk management as follows:

- The Audit Committee is responsible for overseeing the Company’s internal financial and accounting controls, work performed by the Company’s independent registered public accounting firm and the Company’s independent reviewer of internal controls. As part of its oversight function, the Audit Committee regularly discusses with management and the Company’s independent registered public accounting firm the Company’s major financial and controls-related risk exposures and steps that management has taken to monitor and control such exposures.
- The Compensation Committee is responsible for overseeing risks related to the Company’s cash and equity-based compensation programs and practices. As part of its oversight function, the Compensation Committee periodically discusses with the CEO as well as the Board, as necessary, the compensation plans for both executive officers and the non-employee directors, performance goals and objectives for the period and related achievement, peer group and other relevant compensation benchmarks and practices and other matters to ensure the Company’s compensation practices are in the best interest of the Company and its shareholders.
- The N&CG Committee is responsible for overseeing risks related to the composition and structure of the Board and its committees, as well as the Company’s corporate governance which includes oversight of its Environmental, Social and Governance (“ESG”) practices. With respect to the composition of the Board and its committees, on an annual basis, the N&CG Committee assesses the qualifications, independence and diversity of the members of the Board and makes membership recommendations. With respect to the Company’s ESG practices, the N&CG Committee reports to the Board periodically on ESG objectives and status.

We will continue to uphold our strong corporate governance, shareholder rights and executive compensation programs. Our Board also oversees our executive and Board succession planning strategies.

SHAREHOLDER ENGAGEMENT

We actively seek and highly value the views and insights of our shareholders. We meet regularly with our shareholders through a robust schedule of investor meetings, conferences, roadshows and other events. In addition to our traditional investor relations outreach efforts over the last several years, we have also expanded our shareholder engagement program to include meetings with shareholder stewardship and proxy governance teams specifically to discuss proxy proposals, overall governance and executive compensation programs, and ESG reporting and initiatives. These discussions often involve our Board Chairperson and/or Board committee members, our CEO, members of our executive management team as appropriate, and our head of investor relations.

Our shareholder engagement program in 2022, and into 2023, was directed by our Global Head of Investor Relations, with oversight by our CEO, Tony J. Hunt, and our Board Chair, Karen A. Dawes, who also serves as Chair of our N&CG Committee. Participants included Nicolas M. Barthelemy, who serves as Chair of our Compensation Committee and is a member of our N&CG Committee, and Glenn Muir, who serves as Chair of our Audit Committee and is a member of our Compensation Committee. Several of those meetings included Mr. Hunt, as appropriate to the topics of discussion, or by request.

Our shareholder engagement activities have guided our Board meeting agendas and have led to governance enhancements that help us address the issues that matter most to our shareholders. We consider this ongoing engagement process important in creating long-term value and maintaining a culture of integrity, compliance and sustainability.

Conversations with institutional investors in 2022 and into 2023 covered a wide range of topics, primarily focused on the following: our near-term financial performance and long-term financial goals; our business strategies and execution; our investments in capacity to meet customer demand; our plans for managing declines in revenue related to COVID-19 ; our competitive and market positioning; the

durability of headwinds such as industry stocking, supply challenges and currency fluctuations; and growth drivers for the Company including new applications of our technologies. Our ESG-specific discussions were primarily focused on the environmental and social categories, having previously focused more on governance items and responded, for example, with updates to our executive compensation performance metrics and structure (see our 2022 Proxy Statement – “*What We Heard, How We Responded*” tables). More specific to our ESG discussions in 2022 and into 2023, the primary topics were: where and how the Company is positively impacting energy consumption; the status of single-use recycling programs; actions being taken to support and advance our human capital; and steps taken to advance DE&I initiatives and tracking.

ENVIRONMENTAL, SOCIAL AND GOVERNANCE MATTERS

We believe our commitment to environmental, social and governance (“ESG”) matters at all of our global facilities is an important part of creating long-term business value for all stakeholders. We are strongly committed to corporate responsibility and transparency, and we continue to factor sustainability into our business decisions and operations.

ESG Oversight

The Chair of our N&CG Committee oversees ESG matters and practices, as set forth in the N&CG Committee charter. The N&CG Committee reports to the full Board on ESG matters and the Company’s progress on sustainability initiatives. In preparation of our initial sustainability report, published in November 2021, we established an internal Corporate Responsibility Team (“CRT”), comprised of senior leaders across multiple disciplines including sustainability, business operations, human resources, investor relations, legal affairs and corporate compliance, supply chain management and engineering. In addition, we have identified an ESG ambassador at each of our sites around the globe, who takes responsibility for site-level input and data. At least on a quarterly basis, a CRT representative and the N&CG Committee Chair meet to review progress against the Company’s ESG objectives. Our commitment to ESG oversight at both the Board and management levels reflects the importance of ESG-driven policies and programs to our long-term strategic plan.

Compensation-Related ESG Measures

In light of input from our stakeholders, the N&CG Committee has discussed the inclusion of an ESG metric as part of short-term and/or long-term incentive awards made to our NEOs. Beginning in 2022, the N&CG Committee determined that NEOs will annually be assigned certain ESG responsibilities, as appropriate to their role, to support and advance the defined corporate ESG goals. Their level of effectiveness in helping to reaching the corporate ESG goals is considered when determining individual achievement.

For the year 2022, the corporate ESG goals, all of which were achieved, are listed below:

- Increase the number of key sites that have transitioned to 100% renewable electricity
- Advance additional right-sized packaging programs that reduce the number, size and weight of shipments
- Pilot/explore a single-use product recycling/repurpose program
- Advance a comprehensive DE&I program

For the year 2023, the corporate ESG goals include the following:

- Reduce carbon emissions by 10%
- Implement in-process manufacturing waste recycling and landfill mitigation programs across our sites
- Create pathways for post-consumer use product recycling
- Drive employee engagement; act upon employee survey results and further expand professional development programs
- Expand employee resource group support and community outreach programs

United Nations Global Compact Communications on Progress

In establishing a formal approach to ESG in 2020, we completed a materiality assessment to glean insights from internal and external stakeholders, and joined the United Nations Global Compact (“UNGC”) in support of its Ten Principles related to human rights, labor, the environment, and anti-corruption. We committed to providing the UNGC with a periodic communication on progress. We believe our ESG reporting and alliances demonstrate our high ambition, and the actions we have taken to advance our ESG strategy demonstrate our longer-term commitment to being a responsible global corporate citizen.

Our 2020 sustainability report, “*Committed to Making a Difference*”, is built on four pillars: Principles, People, Product and Planet (“4Ps”). Our “4Ps” embody the belief shared by our Board and the executive leadership team that corporate responsibility is essential to sustaining business and economic growth in a manner that can also deliver positive environmental and social impact. At Repligen, we are embracing sustainability as a mindset that encompasses and enhances our ESG profile.

ESG Progress in 2022

In 2022, our ESG initiatives took on fresh energy and momentum, as we hired three full-time employees focused on sustainability, and established an employee resource group (“ERG”) to support employee-driven activities. Our ESG ambassadors at each site continue to populate our financial grade ESG reporting software, enabling more robust analyses across critical ESG metrics.

During 2022, we were pleased to be upgraded to “AA” by MSCI ESG Ratings, from our previous rating of “BBB”. We also received honors from Corporate Register for our 2020 sustainability report, and importantly, we completed a second communication on progress to the UNGC. We were recognized by the UNGC with the prestigious “2022 SDG Pioneer Award, USA Network” for exceptional work toward advancing global goals, through implementation of UNGC’s Ten Principles and integration of Sustainable Development Goals (“SDG”) into our strategy and daily business activities. We are now preparing our next report, for publication during the second half of 2023. We will again report disclosures in accordance with the Sustainability Accounting Standards Board (“SASB”) standards and Global Reporting Initiative (“GRI”) standards, and we also plan to include Task Force on Climate-Related Disclosures (“TCFD”) and Carbon Disclosure Project (“CDP”) disclosures.

In our next report, we expect to disclose more about our ESG targets and where we have made meaningful progress, for example: our transition to 100% renewable electricity at additional key sites; the diversion of waste streams from landfills to recyclers; steps forward on a single-use recycling pilot program; outcomes from our most recent employee engagement survey; advances in our DE&I initiatives; and more.

BOARD MEETINGS AND COMMITTEES

The Board of Directors (“Board”) met five (5) times during the fiscal year ended December 31, 2022. During the fiscal year ended December 31, 2022, each director attended 100% of each of: (i) the total number of meetings of the Board (during the period for which he or she was a director); and (ii) the total number of meetings held by all committees of the Board on which such director served (during the periods that he or she served). The Board has a standing Audit Committee, Compensation Committee, and Nominating and Corporate Governance (“N&CG”) Committee. Each of these standing committees has a charter that has been approved by the Board. Each standing committee reviews the appropriateness of its charter periodically, as conditions dictate, but at least annually.

Audit Committee

The Audit Committee was established in accordance with section 3(a)(58)(A) of the Securities Exchange Act of 1934, as amended (“Exchange Act”) and currently consists of Mr. Muir, Dr. Madaus and Ms. Eglinton Manner. Dr. Madaus replaced Ms. Dawes as a member of the Audit Committee in March 2023. The Audit Committee is responsible for overseeing the accounting and financial reporting processes of the Company and the audits of the financial statements of the Company and exercising the responsibilities and duties set forth below, including but not limited to:

- Appointing, compensating, retaining and overseeing the independence of the Company’s independent registered public accounting firm;
- Overseeing the work performed by any independent registered public accounting firm, including conduct of the annual audit and engagement for any other services;
- Assisting the Board in fulfilling its responsibilities by reviewing: (i) the financial reports provided by the Company to the SEC, the Company’s shareholders or to the general public; and (ii) the Company’s internal financial and accounting controls;
- Recommending, establishing and monitoring procedures designed to improve the quality and reliability of the disclosure of the Company’s financial condition and results of operations;
- Establishing procedures designed to facilitate (i) the receipt, retention and treatment of complaints relating to accounting, internal accounting controls or auditing matters and (ii) the receipt of confidential, anonymous submissions by employees of concerns regarding questionable accounting or auditing matters;
- Engaging advisors as necessary; and
- Serving as the Qualified Legal Compliance Committee in accordance with Section 307 of the Sarbanes-Oxley Act of 2002 and the rules and regulations promulgated by the SEC thereunder.

The Audit Committee met four (4) times during the fiscal year ended December 31, 2022. Mr. Muir currently serves as Chairperson of the Audit Committee. The Board has determined that Mr. Muir qualifies as an “audit committee financial expert” under the rules of the Securities and Exchange Commission (“SEC”). The Board has determined that each member of the Audit Committee is independent within the meaning of the Nasdaq’s director independence standards and the SEC’s heightened director independence standards for audit committee members as determined under the Exchange Act.

The Audit Committee operates under a written charter adopted by the Board, a current copy of which is available on the Company’s website at www.repligen.com under “Investors” — “Corporate Governance” — “Policies and Charters.”

Compensation Committee

The Compensation Committee, of which Mr. Barthelemy, Mr. Muir and Dr. Mhatre are currently members, is responsible (among other duties and responsibilities) for:

- Discharging the Board’s responsibilities relating to the compensation of the Company’s executive officers;
- Administering the Company’s cash incentive compensation and equity incentive plans;
- Reviewing and discussing with management the Compensation Discussion and Analysis for inclusion in the Company’s proxy statement in accordance with applicable rules and regulations;
- Reviewing and making recommendations to management on Company-wide compensation programs and practices;
- Taking final action with respect to the individual salary, bonus and equity arrangements of the Company’s CEO and other executive officers;
- Recommending, subject to approval by the full Board, new equity-based plans and any material amendments thereto (including increases in the number of shares of Common Stock available for issuance thereunder) for which shareholder approval is required or desirable;
- Appointing, overseeing and approving the compensation of any compensation advisers; and
- Evaluating the independence of any such compensation adviser.

The Compensation Committee met three (3) times during the fiscal year ended December 31, 2022. Mr. Barthelemy serves as the Chairperson of the Compensation Committee. The Board has determined that each member of the Compensation Committee is independent within the meaning of the SEC and Nasdaq's director independence standards.

The Compensation Committee operates under a written charter adopted by the Board, which is available on the Company's website at www.repligen.com under *"Investors" – "Corporate Governance" – "Policies and Charters."*

Nominating and Corporate Governance Committee

The N&CG Committee of the Board consists of Ms. Dawes, Mr. Barthelemy, Dr. Konstantinov, and Dr. Madaus. Each of Dr. Konstantinov and Dr. Madaus joined the N&CG Committee in March 2023. The N&CG Committee met two (2) times during the fiscal year ended December 31, 2022. The N&CG Committee is responsible for:

- Identifying individuals qualified to become members of the Board, and selecting or recommending that the Board select the director nominees for election;
- Monitoring compliance with and periodically reviewing the Code of Business Conduct & Ethics; and
- Overseeing the Company's practices and proposed initiatives related to ESG matters.

The N&CG Committee may also consider director nominees recommended by the Company's shareholders as described above.

Ms. Dawes serves as the Chairperson of the N&CG Committee. The Board has determined that each member of the N&CG Committee is independent within the meaning of the SEC's and Nasdaq's director independence standards.

The N&CG Committee operates under a written charter adopted by the Board, which is available on the Company's website at www.repligen.com under *"Investors" – "Corporate Governance" – "Policies and Charters."*

PROPOSAL 2

RATIFICATION OF THE SELECTION OF OUR INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

The Audit Committee of the Board of Directors (“Board”) has appointed Ernst & Young LLP (“E&Y”), an independent registered public accounting firm, to serve as independent auditors for the fiscal year ended December 31, 2022. E&Y has served as the Company’s independent registered public accounting firm since 2002. In accordance with standing policy, E&Y periodically changes the personnel who work on the audits of the Company.

Audit and Non-Audit Fees

The following sets forth the aggregate fees billed by E&Y to the Company and incurred by the Company during the fiscal years ended December 31, 2022 and 2021:

	FY2022	FY2021
Audit Fees	\$ 2,230,600	\$ 2,106,035
Audit Related Fees	—	192,000
Tax Fees	151,000	305,290
All Other Fees	5,000	5,000
Total	<u>\$ 2,386,600</u>	<u>\$ 2,608,325</u>

Audit Fees

Fees for audit services were approximately \$2,230,600 and \$2,106,035 for the fiscal years ended December 31, 2022 and 2021, respectively. These amounts included fees associated with the annual audit of the consolidated financial statements, reviews of the Company’s Form 10-Q and fees associated with the statutory filings and filings with the SEC.

Audit Related Fees

There were no audit related fees for the fiscal year ended December 31, 2022. For the fiscal year ended December 31, 2021, the Company incurred fees of approximately \$192,000 for due diligence activities related to the acquisitions of Avitide and BioFlex.

Tax Fees

Fees billed for tax services were approximately \$151,000 for the fiscal year ended December 31, 2022. This amount included fees associated with transfer pricing studies, the performance of an R&D credit study, consulting and related services.

All Other Fees

E&Y billed \$5,000 in additional fees in 2022 relating to a subscription to E&Y’s online accounting research service.

The Audit Committee of the Board has implemented procedures under the Company’s Audit Committee Pre-Approval Policy for Audit and Non-Audit Services (the “Pre-Approval Policy”), to ensure that all audit and permitted non-audit services provided to the Company are approved by the Audit Committee. Specifically, the Audit Committee pre-approves the use of E&Y for specific audit and non-audit services, within approved monetary limits. If a proposed service has not been pre-approved pursuant to the Pre-Approval Policy, then it must be specifically pre-approved by the Audit Committee before E&Y may provide the services. Any pre-approved services exceeding the limits pre-approved by the Audit Committee must again be pre-approved by the Audit Committee. All of the audit-related, tax and other services provided by E&Y to the Company for the fiscal year ended December 31, 2022 were pre-approved by the Audit Committee. All non-audit services provided in the fiscal year ended December 31, 2022 were reviewed with the Audit Committee, which concluded that the provisions of such services by E&Y was compatible with the maintenance of that firm’s independence in the conduct of its auditing functions.

In connection with the audit for the fiscal year ended December 31, 2022, there were no disagreements with E&Y on any matter of accounting principles or practices, financial statement disclosure or auditing scope or procedure, which, if not resolved to the satisfaction of E&Y, would have caused them to refer to such disagreement in connection with their report.

A member of E&Y is expected to be present at the virtual Annual Meeting with the opportunity to make a statement if so desired and will be available to respond to appropriate questions.

Accordingly, the Board believes ratification of the appointment of E&Y as the Company’s independent registered public accounting firm for the current year is in the best interests of the Company and its shareholders and recommends a vote FOR the ratification of E&Y as the Company’s independent registered public accounting firm.

AUDIT COMMITTEE REPORT

This report is furnished by the Company's Audit Committee with respect to the Company's financial statements for fiscal year 2022. The Company's management is responsible for the preparation and presentation of complete and accurate financial statements. The independent registered public accounting firm E&Y is responsible for performing an independent audit of the Company's financial statements in accordance with the standards of the Public Company Accounting Oversight Board (United States) ("PCAOB") and for issuing a report on its audit. The Audit Committee oversees and monitors the Company's management and its independent registered public accounting firm throughout the financial reporting process.

The material in this report is not "soliciting material," is not deemed filed with the Securities and Exchange Commission ("SEC"), and is not to be incorporated by reference in any filing of the Company under the Securities Act of 1933, as amended ("Securities Act") or under the Securities Exchange Act of 1934, as amended ("Exchange Act"), whether made before or after the date hereof and irrespective of any general incorporation language in any such filing.

The Audit Committee currently consists of Mr. Muir, Chairperson, Dr. Madaus and Ms. Eglinton Manner. Dr. Madaus replaced Ms. Dawes as a member of the Audit Committee on March 2, 2023. The Audit Committee has the responsibility and authority described in the Repligen Audit Committee Charter, which has been approved by the Board. The Board has determined that the members of the Audit Committee meet the independence requirements set forth in Rule 10A-3(b)(1) under the Exchange Act and the applicable rules of the National Association of Securities Dealers, Inc., and that Mr. Muir qualifies as an "audit committee financial expert" under the rules of the SEC. The Audit Committee oversees the accounting and financial reporting processes of the Company and the audits of the financial statements of the Company. Management has the primary responsibility for the financial statements and the reporting process, including the systems of internal controls.

In fulfilling its oversight responsibilities, the Audit Committee reviewed and discussed with management of the Company and E&Y the audited financial statements included in the Company's Annual Report on Form 10-K ("Form 10-K") for the fiscal year ended December 31, 2022, including a discussion of the quality, not just the acceptability, of the accounting principles, the reasonableness of significant judgments and the clarity of disclosures in the financial statements. The Audit Committee also reviewed the Company's quarterly financial statements for the first three fiscal quarters during the fiscal year ended December 31, 2022 and discussed them with both the management of the Company and E&Y prior to including such interim financial statements in the Company's Quarterly Reports on Form 10-Q. In connection with the Company's Form 10-K for the fiscal year ended December 31, 2022 and the Form 10-Q for each of its first, second and third fiscal quarters of the fiscal year ended December 31, 2022, the Audit Committee discussed the results of the Company's certification process relating to the statements in the Company's Form 10-Qs, as well as financial statements under Sections 302 and 906 of the Sarbanes-Oxley Act. The Audit Committee also discussed with E&Y the matters required to be discussed by the PCAOB's Auditing Standard No. 1301, Communication with Audit Committees, and the SEC. In addition, the Audit Committee has received from E&Y the written disclosures and the letter from E&Y as required by applicable requirements of the PCAOB regarding E&Y's communications with the Audit Committee concerning independence and has discussed with E&Y their independence.

The Audit Committee also reviewed management's report on its assessment of the effectiveness of the Company's internal control over financial reporting and E&Y's report on the effectiveness of the Company's internal control over financial reporting.

The Audit Committee discussed with E&Y the overall scope and plans for their audit. The Audit Committee met with E&Y to discuss the results of their examinations, their evaluations of the Company's internal controls, including internal control over financial reporting, and the overall quality of the Company's financial reporting.

The Audit Committee has also evaluated the performance of E&Y, including, among other things, the amount of fees paid to E&Y for audit and non-audit services. Based on its evaluation, the Audit Committee has selected E&Y to serve as the Company's auditors for the fiscal year ending December 31, 2023. The shareholders of the Company are being asked to ratify the selection of E&Y as the Company's independent public accounting firm in Proposal 2 of this Proxy Statement.

The Audit Committee met four (4) times during the fiscal year ended December 31, 2022. In reliance on the reviews and discussions referred to above, the Audit Committee recommended to the Board that the Company's audited financial statements and management's assessment of the effectiveness of the Company's internal controls over financial reporting be included in the Form 10-K for the fiscal year ended December 31, 2022 filed with the SEC, and the Board approved such inclusion.

Respectfully submitted by the Audit Committee,

Glenn P. Muir, Chairperson
Karen A. Dawes (member of the Audit Committee through March 2, 2023)
Carrie Eglinton Manner

PROPOSAL 3

ADVISORY VOTE ON EXECUTIVE COMPENSATION

The Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 (the “Dodd-Frank Act”) enables our shareholders to vote to approve, on an advisory basis, the compensation of our named executive officers (“NEOs”) as disclosed in this Proxy Statement in accordance with the Securities and Exchange Commission’s (“SEC’s”) rules.

As described in the section entitled “*Compensation Discussion and Analysis*” which begins on page 38 and in the accompanying tables and narrative disclosure, our executive compensation programs are designed to motivate our executive officers to enhance shareholder value, to provide a fair reward for this effort and to stimulate our executive officers’ professional and personal growth. The Company seeks to provide near-term and long-term financial incentives that align the executive officers’ interest with those of the shareholders and focus executive officer behavior on the achievement of near-term corporate goals, as well as long-term business objectives and strategies. We believe that this alignment between executive compensation and shareholder interests has driven corporate performance over time.

Our shareholders voted on May 18, 2017, to have advisory votes every year to approve the compensation paid to the Company’s NEOs, and we have adopted that approach. The Board of Directors (“Board”) and Compensation Committee make executive compensation decisions every year, and our directors will look to the annual advisory vote for information to be taken into account when they make decisions with respect to our compensation philosophy, policies and practices. **Accordingly, we are asking our shareholders to vote FOR the following non-binding, advisory resolution on the approval of the compensation of the Company’s NEOs as disclosed in this Proxy Statement:**

“RESOLVED, that the shareholders of the Company approve, on an advisory basis, the compensation of the Company’s NEOs, as disclosed in this Proxy Statement, including the Compensation Discussion and Analysis, compensation tables and narrative discussion.”

We urge you to read the “*Compensation Discussion and Analysis*” section of this Proxy Statement and the accompanying tables and narrative disclosure for additional details on the Company’s executive compensation, including our governance, framework, components, and the compensation decisions for the NEOs for the fiscal year ended December 31, 2022.

As an advisory vote, the results of this vote will not be binding on the Board or the Company. However, the Board and the Compensation Committee value the opinions of our shareholders and will consider the outcome of the vote when making future decisions on the compensation of our NEOs and the Company’s executive compensation principles, policies and procedures.

The Board unanimously recommends that shareholders vote FOR approval, on an advisory basis, of the compensation of the Company’s NEOs, as disclosed in this Proxy Statement, including the “*Compensation Discussion and Analysis*”, compensation tables and narrative discussion.

COMPENSATION COMMITTEE REPORT

The Compensation Committee of the Board, which is comprised solely of independent directors as defined under the applicable rules of Nasdaq and non-employee directors as defined under Rule 16b-3 under the Securities Exchange Act of 1934, as amended (“Exchange Act”), is responsible for developing executive compensation policies, advising the Board with respect to such policies, and administering the Company’s cash and equity incentive plans. The Compensation Committee sets performance goals and objectives for the CEO and the other executive officers, evaluates their performance with respect to those goals and sets their compensation based upon the evaluation of their performance. In evaluating executive officer pay, the Compensation Committee may retain the services of a compensation consultant and consider recommendations from the CEO with respect to goals and compensation of the other executive officers. The Compensation Committee assesses the information it receives in accordance with its business judgment. The Compensation Committee also periodically reviews non-employee director compensation. All decisions with respect to executive compensation are approved by the Compensation Committee and all decisions with respect to director compensation are recommended by the Compensation Committee to the full Board for approval.

The Compensation Committee of the Company has reviewed and discussed the “*Compensation Discussion and Analysis*” required by Item 402(b) of Regulation S-K with management and, based on such review and discussions, the Compensation Committee recommended to the Board that the “*Compensation Discussion and Analysis*” be included in this Proxy Statement.

Respectfully submitted by the Compensation Committee:

Nicolas M. Barthelemy, Chairperson
Rohin Mhatre, Ph.D.
Glenn P. Muir

PROPOSAL 4

ADVISORY VOTE ON THE FREQUENCY OF FUTURE ADVISORY VOTES ON THE COMPENSATION OF OUR NAMED EXECUTIVE OFFICERS

Section 14A(a)(2) of the Securities Exchange Act of 1934, as amended (“Exchange Act”) enables our shareholders to vote, on a non-binding, advisory basis, on how frequently we should submit future “say-on-pay” votes, similar to Proposal 3, on the compensation of our named executive officers (“NEOs”). Under Section 14A(a)(2) of the Exchange Act, generally, each public company must submit this proposal to its shareholders not less than every six years, and this proposal was last submitted to our shareholders at our 2017 Annual Meeting of Stockholders.

Shareholders may choose to recommend that future “say-on-pay” proposals be held (i) every year (“1 YEAR” on the proxy card), (ii) every two years (“2 YEARS” on the proxy card) or (iii) every three years (“3 YEARS” on the proxy card). In addition, shareholders may choose to abstain from voting on this Proposal 4.

After careful consideration, our Board of Directors (“Board”) recommends that future non-binding, advisory votes on executive compensation should be held every year. Annual votes will provide the Board and the Compensation Committee with the most timely feedback regarding the compensation of our NEOs. The primary focus of the disclosure of the compensation of our NEOs required to be included in our proxy statements is compensation granted in or for the prior fiscal year. Accordingly, an annual executive compensation advisory vote will complement the annual focus of our proxy statement disclosure and provide the Board and Compensation Committee with the clearest and most timely feedback of the three frequency options. Additionally, an annual executive compensation advisory vote is consistent with our policy of reviewing our compensation programs annually, as well as considering input from our stockholders on corporate governance and executive compensation matters. This feedback may then be considered by the Board and Compensation Committee in their annual decision-making process. For these reasons, we believe an annual vote would be the best governance practice for the Company at this time. This vote is advisory, and therefore not binding on the Board or Compensation Committee. However, the Board and Compensation Committee value the opinions of our shareholders and intend to take into account the outcome of the vote when considering the frequency of holding future advisory votes on the compensation of our NEOs.

The Board unanimously recommends that shareholders vote, on a non-binding, advisory basis, for every year (“1 YEAR” on the proxy card) as the frequency for future non-binding, advisory shareholder votes regarding the compensation of our NEOs.

PROPOSAL 5

APPROVE AN AMENDMENT TO THE CERTIFICATE OF INCORPORATION TO PERMIT THE BOARD OF DIRECTORS TO ADOPT, AMEND OR REPEAL THE BY-LAWS

The Board of Directors (“Board”) has declared advisable and approved, subject to shareholder approval, an amendment to the Company’s certificate of incorporation, as amended (the “Certificate of Incorporation” or “Charter”) to permit the Board to adopt, amend or repeal the By-laws.

BACKGROUND TO CHARTER AMENDMENT PROPOSAL

As described in the definitive proxy statement relating to our 2017 Annual Meeting of Stockholders (the “2017 Annual Meeting”), the Board previously asked our shareholders to adopt a resolution approving an amendment to the Company’s by-laws (the “By-laws”) to permit our Board to alter, amend or repeal our existing By-laws or adopt new by-laws. At our 2017 Annual Meeting, the shareholders approved the proposal to amend the By-laws to permit the Board to alter, amend or repeal our existing By-laws or adopt new by-laws by the vote of the majority of the Board, provided that our Board would not have the power to alter, amend or repeal Section 6 of Article I of the By-laws (dealing with quorum for meetings of shareholders and the voting standard for the election of directors), Section 1 of Article V of the By-laws (providing for mandatory indemnification of all persons whom the Company is permitted to indemnify) and Article VII (relating to amendments to the By-laws) and provided further that the Board may not adopt, alter or repeal any by-laws adopted by the shareholders after May 18, 2017.

Under Delaware law, however, in order for a board of directors to have the power to adopt, amend or repeal a corporation’s by-laws, a company’s certificate of incorporation must provide the board of directors with such power. Therefore, we are currently asking our shareholders to approve an amendment to our Certificate of Incorporation, to permit our Board to adopt, amend or repeal the By-laws (the “Charter Amendment”). If approved, the Charter Amendment would allow our Board to alter, amend or repeal our existing By-laws or adopt new by-laws, without regard to any of the limitations in the By-laws as adopted at the 2017 Annual Meeting, but subject to applicable law.

REASONS FOR THE CHARTER AMENDMENT PROPOSAL

By giving our Board the ability to amend the By-laws, the Charter Amendment will allow the Board to adopt amendments to our By-laws that the Board believes are in the best interest of the Company and its shareholders and to do so in a timely fashion and not to incur the time delay and additional expenses associated with obtaining shareholder approval. Requiring shareholders to approve all By-law amendments, including ministerial amendments, is inefficient and could delay implementation of By-law amendments that may be in the best interests of the Company’s shareholders. Additionally, the shareholders’ ability to amend the By-laws would not be affected in any way by this amendment. If the Board is given the power to amend the By-laws, shareholders will retain the concurrent power to alter or amend the By-laws, including any provisions implemented unilaterally by the Board.

The limitation on the authority of the Board to amend the By-laws is uncommon among our peer companies. In this regard, according to FactSet Research Systems Inc., 98.2% of companies in the S&P 400 and 97.9% of companies in our SIC Group (Grp 28) provide their boards of directors the power to amend their by-laws without shareholder approval. As such, if shareholders approve this proposal, the Company would be much more in line with the corporate governance practices of its peers.

The grant of authority to the Board to amend the By-laws could be construed as having an anti-takeover effect, but is not being offered for this purpose. The grant of this authority to the Board would allow the Board, subject to its fiduciary duties and applicable law, to amend the By-laws for the purpose of resisting a third-party transaction that is favored by a majority of our shareholders. The Board could also, subject to its fiduciary duties and applicable law, amend the By-laws to make it more difficult for our shareholders to remove incumbent management and directors from office. This Charter Amendment is not being offered for any of the purposes described above, and, even if it is approved and the Board exercises its power to amend our By-laws, our shareholders will continue to have the right to amend the By-laws and could repeal any By-law amendments adopted by the Board.

EFFECT OF THE CHARTER AMENDMENT PROPOSAL

If the Charter Amendment is approved by our shareholders, the Board will be permitted to adopt, amend or repeal the By-laws. The Charter Amendment will become effective upon the filing with the Secretary of State of the State of Delaware (the “Secretary of State”) of a certificate of amendment to our Charter. If the Charter Amendment is approved, the following Article ELEVENTH will be added to our Charter:

“To the fullest extent permitted by law, the Board of Directors shall have the power to alter, amend or repeal the By-laws of the Corporation and to make new by-laws.”

If the Charter Amendment Proposal is approved by our shareholders, we will file the certificate of amendment to our Charter attached hereto as Appendix A promptly after the final adjournment of the 2023 Annual Meeting of Shareholders. If the Charter Amendment Proposal is not approved by our shareholders, our Charter will remain the same and our Board will not have the authority to alter, amend or repeal the By-laws or make new by-laws.

The above description of the proposed amendment to our Charter is qualified by the full text of the proposed amendment, which is attached to this Proxy Statement as Appendix A.

The Board recommends that shareholders vote FOR an amendment to our Certificate of Incorporation to permit the Board to adopt, amend or repeal the By-laws and to make new by-laws.

PROPOSAL 6

APPROVE THE RATIFICATION OF THE AMENDMENT AND RESTATEMENT OF THE BY-LAWS ADOPTED BY THE BOARD OF DIRECTORS ON JANUARY 27, 2021 TO IMPLEMENT STOCKHOLDER PROXY ACCESS

Our Board of Directors (“Board”) has determined that it is advisable and in the best interests of the Company and our shareholders to ratify, pursuant to Section 204 of the Delaware General Corporation Law (the “DGCL”), the adoption and effectiveness of the Third Amended and Restated By-laws (the “Third Amended and Restated By-laws” or “By-law Amendments”), previously approved by the Board on January 27, 2021 (the “Ratification”). This Ratification shall be retroactive to the date of adoption of the By-law Amendments, January 27, 2021. A marked copy of the Third Amended and Restated By-laws showing changes from the Second Amended and Restated By-laws is attached hereto as Appendix B.

BACKGROUND ON THE RATIFICATION

As described under Proposal 5, (the “Charter Amendment Proposal”), at our 2017 Annual Meeting of Stockholders, the shareholders approved a proposal to amend the By-laws to permit the Board to alter, amend or repeal existing by-laws or adopt new by-laws. Under Delaware law, however, in order for a board of directors to have the power to adopt, amend or repeal a corporation’s by-laws, a company’s certificate of incorporation must provide the board of directors with the power to do so. Because our Charter does not currently include a provision providing our Board the power to adopt, amend or repeal our By-laws, our Board does not currently have such power.

Our Current Report on Form 8-K filed with the Securities and Exchange Commission (“SEC”) on January 28, 2021 disclosed that on January 27, 2021, the Board approved the amendment and restatement of the Company’s By-laws. The By-law Amendments were adopted by the Board to implement “stockholder proxy access” (described below). While the By-law Amendments were adopted by our Board, they were not approved by our shareholders. The adoption and effectiveness of the By-law Amendments constitute a “defective corporate act” as that term is defined in Section 204(h)(1) of the DGCL. The “failure of authorization” (as defined in Section 204(h)(2) of the DGCL) in respect of such defective corporate act is that the By-law Amendments were not validly adopted by a vote of our shareholders under Section 109 of the DGCL. At the time of adoption of the By-law Amendments, because our Certificate of Incorporation (“Certificate of Incorporation” or “Charter”) did not empower the Board to alter, amend or repeal the By-laws, any amendments to the By-laws could only be validly adopted by the requisite vote of our shareholders. No such vote of shareholders was sought or obtained. As such, currently the By-laws that are in effect at the Company are the Second Amended and Restated By-laws, which do not provide shareholders with proxy access.

REASONS FOR THE RATIFICATION PROPOSAL; MATTERS RELATED TO SECTION 204 OF THE DGCL

Section 204 of the DGCL allows a Delaware corporation, by following specified procedures, to ratify a defective corporate act retroactive to the date the defective corporate act was originally taken. If the By-law Amendment is ratified by shareholders, this ratification will be retroactive to January 27, 2021, the date the Board approved the By-law Amendments.

Our Board has determined that it is advisable and in the best interests of the Company and our shareholders to ask our shareholders to ratify the By-law Amendments in accordance with Section 204 of the DGCL and Delaware common law, and unanimously adopted resolutions approving the Ratification. Our Board also recommended that our shareholders approve the Ratification for purposes of Section 204, and directed that the Ratification be submitted to our shareholders entitled to vote thereon for approval.

Subject to the receipt of the required vote of our shareholders to approve the Ratification, the By-law Amendments will be effective, with such effectiveness retroactive to the date of adoption of the By-law Amendments, January 27, 2021.

If the Ratification becomes effective, under the DGCL, any claim that (i) the By-law Amendment ratified pursuant to the Ratification is void or voidable due to a failure of authorization or (ii) the Delaware Court of Chancery should declare, in its discretion, that the By-law Amendment not be effective or be effective only on certain conditions must be brought within 120 days from the validation effective time in respect of the Ratification, which will occur upon the certification of the shareholder vote for the 2023 Annual Meeting of Shareholders (the “Annual Meeting”).

This Proxy Statement and the notice provided to shareholders in connection with the Annual Meeting constitute the notice required to be given to our shareholders under Section 204 of the DGCL in connection with the ratification of the By-law Amendments.

EFFECT OF THE RATIFICATION PROPOSAL; STOCKHOLDER PROXY ACCESS

As described above, this Proposal 6 (the “Ratification Proposal”) is intended to ratify the adoption and effectiveness of the By-law Amendments, which implement “stockholder proxy access.” If the Ratification Proposal is approved, Article I, Section 11 of the By-laws, which was added as a result of the By-law Amendments on January 27, 2021, will be valid, and would permit a shareholder, or a group of up to 20 shareholders, to nominate up to twenty percent (20%) of the number of directors then in office, rounded down to the nearest whole number and subject to other stated reductions, if the shareholder or group has owned at least three percent (3%) of the Company’s common stock continuously for at least three years and satisfies certain eligibility, procedural and disclosure requirements set forth in the By-law Amendments. The adoption of the Ratification Proposal is intended to give shareholders a right to proxy access and will not have an anti-takeover effect.

CONSEQUENCES IF THE RATIFICATION IS NOT APPROVED BY OUR SHAREHOLDERS

If the Ratification is not approved by the requisite vote of our shareholders, the By-law Amendments will not be ratified in accordance with Section 204 of the DGCL, the Company’s Second Amended and Restated By-laws will remain in effect, and shareholders will not have proxy access. If shareholders adopt the Charter Amendment Proposal, but do not approve the Ratification Proposal, the Board of Directors may adopt similar shareholder proxy access by-law amendments at any time in the future.

The Board recommends that shareholders vote FOR ratification of the adoption and effectiveness of the By-law Amendments that were adopted to implement stockholder proxy access.

COMPENSATION DISCUSSION AND ANALYSIS

Our Compensation Discussion and Analysis describes our executive-compensation philosophy and program as reported in the executive-compensation tables that follow, which provide information relating primarily to compensation decisions for the following 2022 Named Executive Officers (“NEOs”) of the Company:

2022 NEOs	Position(s)
Tony J. Hunt	President, Chief Executive Officer and Director
Jon K. Snodgres	Chief Financial Officer
James R. Bylund	Chief Operating Officer
Christine Gebski	Senior Vice President, Filtration and Chromatography
Ralf Kuriyel	Senior Vice President, Research and Development

Business & Financial Highlights 2022

For the fiscal year ended December 31, 2022, we achieved our business and financial goals for the year, remaining focused on base business growth and new product launches into the bioprocessing market, where we serve the needs of biopharmaceutical developers, contract development and manufacturing organizations and other life sciences tool companies. We are proud to offer our customers highly differentiated technologies and systems that are suited to the complexities and pressure of modern biopharmaceutical manufacturing, enabling efficiencies in the production of monoclonal antibodies (“mAbs”), recombinant proteins, mRNA vaccines and therapeutics, cell and gene therapies (“C>”), and more. We operate true to our vision of “inspiring advances in bioprocessing.” We are keenly focused on achieving our corporate goals which drives our broader purpose to return long-term value to our customers and shareholders.

Please see “2022 Business Highlights” on page 10 of our Proxy Summary for an overview of our accomplishments for the fiscal year ended December 31, 2022.

COVID-19 Business Impacts

Our global operations have been and continue to be affected by the ongoing impact of the COVID-19 pandemic and the resulting volatility and uncertainty it has caused in the United States and international markets. During the year ended December 31, 2022, many businesses and countries, including the United States, continued applying preventative and precautionary measures designed to mitigate the spread of the virus and its variants including government orders and other restrictions on the conduct of business operations. Similar to other companies, from the onset of COVID-19, we implemented measures to support the health and well-being of our employees, customers, partners and communities, including working remotely and operating our business in a fundamentally different way.

While COVID-19 restrictions imposed by state and local governments have largely been lifted, COVID-19 continues to disrupt business and negatively impact consumer and business confidence. COVID-19 continues to be dynamic, and near-term challenges across the economy remain. The ongoing effects of COVID-19 remain difficult to predict due to numerous uncertainties, including the severity, duration and resurgence of the outbreak, new variants, the effectiveness of health and safety measures including vaccines, the pace and strength of the economic recovery, and supply chain pressures, among others. The Company’s commercial operations have not been significantly impacted by COVID-19 to date, although revenue related to COVID-19 is expected to continue to decline in 2023 as the demand for vaccines decreases. We will continue to actively monitor the effects of COVID-19 and will continue to take appropriate steps to mitigate the impacts to our employees and on our business results.

Compensation Philosophy

In accordance with the Company’s compensation philosophy, the Company provides compensation that the Compensation Committee believes will attract and retain high-performing talent in our industry, motivate the Company’s executive officers to create long-term, enhanced shareholder value, and provide a fair reward for executive effort and stimulate professional and personal growth.

It is the responsibility of the Compensation Committee of the Board of Directors (“Board”) to administer the Company’s compensation programs to ensure that they are competitive with other bioprocessing, healthcare supply and biotechnology companies, and to include incentives that are designed to appropriately drive the Company’s continued development to create shareholder value. The Compensation Committee reviews and approves all components of the Company’s executive officer compensation, including base salaries, annual cash incentive compensation, and equity incentive compensation.

Compensation Objectives

The Company believes that the compensation of its executive officers should align the executive officers’ interests with those of the shareholders and focus executive officer behavior not only on the achievement of near-term corporate goals, but also on the achievement of long-term business objectives and strategies.

To achieve these objectives, the Company's compensation program for its executive officers:

- **Ensures that salaries and total compensation are competitive with other similar-sized bioprocessing, healthcare supply and biotechnology companies** with which the Company competes for talent, as determined by comparing the Company's pay practices with those of similar companies;
- **Combines annual and long-term components**, cash and equity, and both fixed and variable elements with a weighting towards performance-based compensation and long-term equity awards. We believe this mix, including significant vesting periods, best ties executive performance with shareholder returns.
- **Motivates** our executive officers to manage the business to meet the Company's near- and long-term objectives through our annual cash incentive compensation.
- **Ensures that our equity incentive compensation, including performance-based equity awards**, is designed so that our executive officers are motivated over the long-term to respond to the Company's business challenges and opportunities as owners as well as employees, thereby aligning the executive officers' interests with those of shareholders.

The following features of our compensation programs are designed to protect and promote the interests of our shareholders while aligning executive compensation with performance. Below we summarize practices we follow to incentivize performance and retain leadership, and practices we do not follow because we do not believe they serve the long-term interests of our shareholders:

We Do	We Don't
✓ Pay for Performance: We emphasize performance-based compensation that aligns the interests of our shareholders and executive officers through the use of both near-term cash incentive compensation and longer-term equity awards subject to both time- and performance-based vesting.	X Hedge or Pledge: We do not allow executive officers to engage in hedging or pledging of our securities.
✓ Benchmark: We maintain an industry-specific peer group for annual benchmarking of executive compensation. This benchmarking is a key factor among those used to determine appropriate compensation for our named executive officers ("NEOs").	X Re-Pricing: We do not allow for re-pricing of underwater stock options without shareholder approval.
✓ Benefits: We offer market-competitive benefits for executives that are consistent with the benefits we offer all employees.	X Gross up Payments: We do not provide tax gross-up payments for our executive officers.
✓ Consult: We consistently engage an independent compensation consultant to advise on compensation levels and practices.	X Excess Perquisites: We do not provide excessive perquisites to our employees.
✓ Risk Assessment: We perform an annual compensation risk assessment.	X Executive Retirement Benefits: We do not provide supplemental executive retirement plans, nonqualified defined contribution or deferred compensation plans to our executive officers.
✓ Stock Ownership Requirements: We maintain stock ownership guidelines that require our directors, our CEO and our NEOs to maintain a specified level of ownership in the Company.	X Guaranteed Bonuses: We do not provide guaranteed bonuses to our executive officers.
✓ Thresholds and Caps on Incentive Payouts: We have minimum thresholds and maximum payout caps on near- and long-term performance-based incentive compensation.	

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We Do	We Don't
<p>✓ Clawback: We have a clawback policy and may claw back all or a portion of cash and equity incentive compensation paid to NEOs in the event of a financial accounting restatement. In light of the Securities and Exchange Commission's ("SEC's") adoption of final clawback rules in October 2022, we intend to update our clawback policy to comply with applicable Nasdaq listing rules when effective.</p>	
<p>✓ Double Trigger: We provide each NEO severance benefits that are triggered only upon a qualifying termination of employment following a change in control (i.e., double trigger), except for a one-time special long-term equity award to the CEO(1).</p>	

(1) The one-time special award was granted to Mr. Hunt in 2018 in recognition of past performance and to provide additional long-term retention incentive in light of the high demand for executive talent within our industry, and was overall designed to protect shareholder interests.

Compensation Evaluation Processes

The Company's executive officer compensation consists of three primary components: base salary, annual cash incentive compensation and equity incentive compensation. Each of these components is intended to complement the others, and taken together, to satisfy the Company's compensation objectives. The Compensation Committee considers a number of factors in setting compensation for its executive officers, including Company performance, the executive's functional performance, experience and responsibilities, and the compensation of executive officers in similar positions in our peer group of companies.

Our Board and executive team actively seek and highly value the views and insights of our shareholders. In evaluating our executive compensation programs for the fiscal year ended December 31, 2022, the Compensation Committee considered the shareholder advisory vote on our executive compensation, or the "say-on-pay" vote, for the fiscal year ended December 31, 2021, which was approved by approximately 98% of the votes cast. The Compensation Committee believes that the shareholders, through this advisory vote, endorsed the compensation philosophies of the Company and, thus, the Compensation Committee maintained the basic structure and design of our executive compensation programs for fiscal year 2022 but made certain adjustments to our executive compensation program in response to shareholder feedback as discussed in more detail under the heading "Corporate Governance and Board Matters – Shareholder Engagement" on page 25. The Compensation Committee intends to continue to focus on aligning executive compensation programs with the interests of our shareholders and current market practice, including a continued emphasis on pay for performance. We currently hold a "say-on-pay" vote on an annual basis, and our Board has recommended that shareholders vote, on a non-binding, advisory basis, to continue to hold such votes annually, as outlined in Proposal 4.

Role of Compensation Consultant

In establishing compensation levels for each executive officer, the Compensation Committee has the authority to engage the services of outside experts. In the fiscal year ended December 31, 2022, the Compensation Committee retained Meridian Compensation Partners, LLC ("Meridian"), an independent compensation consulting firm, to assist the Compensation Committee in assessing the competitiveness and effectiveness of the Company's executive compensation programs. In addition, our finance and human resources departments support the Compensation Committee in its work and act in accordance with the direction given to them to administer our compensation programs.

The Compensation Committee has assessed any potential conflicts of interest raised by the work of Meridian pursuant to SEC rules, and has determined that no such conflict of interest exists.

During the fiscal year ended December 31, 2022 and in March 2023, the Compensation Committee held meetings with management and representatives of Meridian to:

- Review our compensation objectives;
- Review the actual compensation of our executive officers for consistency with our objectives;
- Analyze trends in executive compensation;
- Assess our variable cash compensation structure, as well as incentive plan components and mechanics, to ensure an appropriate correlation between pay and performance with resulting compensation opportunities that balance returns to the Company and its shareholders;

- Assess our equity-based awards programs against our objectives of executive incentive, retention and alignment with shareholder interests;
- Review our peer group and consider appropriate changes related to the realignment of our business;
- Benchmark our executive cash compensation and equity-based awards programs, and assess our pay versus performance against our peer group; and
- Review recommendations for fiscal year 2023 compensation for appropriateness relative to our compensation objectives.

Use of Peer Group to Benchmark Compensation

Meridian provided the Compensation Committee with an analysis of base salary, target bonus, target total cash, long-term incentive value and design, and target total compensation for executives, as well as an analysis of cash and equity compensation for non-employee directors of comparable companies in the biotechnology, bioprocessing and health care supplies industries. In the analysis used for 2022 pay decisions, Meridian used a peer group of 18 biotechnology/bioprocessing and health care supply companies, which was reviewed and approved by our Compensation Committee. The companies in the 2022 peer group had revenues with a median of \$660.0 million, as compared to the Company's total revenue of \$801.5 million in fiscal year 2022.

The peer group used for 2022 compensation decisions and approved by the Compensation Committee consisted of the following companies:

Amarin Corporation plc	Coherus BioSciences, Inc.	Neogen Corporation
Atricure, Inc.	Globus Medical, Inc.	NeoGenomics, Inc.
Azenta, Inc.	Halozyme Therapeutics, Inc.	NovaCure Limited
Bio-Rad Laboratories, Inc.	Luminex Corporation	Sarepta Therapeutics, Inc.
Bio-Techne Corporation	Medpace Holdings, Inc.	Supernus Pharmaceuticals, Inc.
Bruker Corporation	Meridian Bioscience, inc.	Waters Corporation

Each year, Meridian, in conjunction with our Compensation Committee, re-evaluates our peer group in light of developments in the market and our industry and the evolution of the Company (e.g., revenue and market capitalization). As a result of this review in 2022, four companies were added to the peer group (Azenta, Inc., Bio-Rad Laboratories, Inc., Bruker Corporation and Waters Corporation), and four companies were removed from the peer group (Anika Therapeutics, Inc., Brooks Automation, Inc., Fluidigm Corporation and Mesa Laboratories, Inc.) compared to the prior year. This group of 18 companies will be used for 2023 pay decisions.

The Compensation Committee uses the peer group compensation data as one of several factors in determining appropriate compensation parameters for base salary, variable cash compensation and equity-based, long-term incentives. The Compensation Committee's executive compensation decisions are made on a case-by-case basis, and specific benchmark results do not, in and of themselves, determine individual target compensation decisions.

While the Compensation Committee generally targets each NEO's total compensation to be within a competitive range of the 50th to 75th percentile of the peer group, it considers a number of additional factors to determine the appropriate level of each NEO's total compensation and each component of compensation, including Company performance and the relevant executive's performance, experience, responsibilities and impact. Due to these other factors, the Compensation Committee may set an NEO's compensation below, at or above the 50th percentile of the peer group.

Annual Review of Long-Term Incentives

The Compensation Committee believes that equity incentives, in the form of stock options, RSUs, and PSU awards, subject to vesting over time or upon achievement of performance objectives, are effective vehicles to align individual and team performance with the achievement of the Company's strategic and financial goals over time, retain our NEOs and align the interests of our NEOs with those of our shareholders.

Stock options allow our executive officers to purchase a fixed number of shares of our Common Stock for a fixed price (i.e., exercise price) during a fixed period of time. The exercise price is set at the closing price of a share of Company Common Stock on the date of grant. A stock option only has value if our share price exceeds the exercise price of the option. Each RSU and PSU award corresponds in value to a single share of Company Common Stock. Therefore, the value of these grants is directly affected by increases and decreases in our share price.

In February 2022, the Compensation Committee granted to the NEOs, time-based stock options and RSUs that vest over a three-year period and PSUs that are earned and vest based on the extent to which certain pre-determined performance metrics are met by the end of a three-year performance period. The size of these grants was based on Compensation Committee-approved target long-term incentive levels for each of the NEOs.

Executive Compensation

Base Salary

Base salary represents the fixed portion of an executive officer's compensation and is intended to provide compensation for day-to-day performance. The Compensation Committee believes that a competitive base salary is a necessary element of any compensation program that is designed to attract and retain talented and experienced executives. Each executive officer's base salary is initially determined upon hire or promotion based on the executive officer's responsibilities, prior experience, individual compensation history and salary levels of other executives within the Company and similarly situated executives within our peer group. Base salary is typically reviewed annually. The Compensation Committee believes that the base salaries paid to our executive officers during the fiscal year ended December 31, 2022 achieved the Company's compensation objectives. Base salaries for the NEOs for 2022 and 2021 are as follows:

Name	2022 Base Salary (\$) ⁽¹⁾	2021 Base Salary (\$) ⁽¹⁾	Base Salary Increase in 2022 vs. 2021 (%)
Tony J. Hunt	800,000	761,000	5.1
Jon K. Snodgres	465,426	432,954	7.5
James R. Bylund (2)	424,710	363,000	17.0
Christine GebSKI	365,508	351,450	4.0
Ralf Kuriyel	374,286	363,384	3.0

- (1) The compensation report prepared by Meridian showed that the 2022 base salaries of these NEOs are competitive with the 50th percentile among the Company's 2022 peer group as disclosed above. These base salary increases were based on each NEO's performance, qualifications, experience, responsibilities and compensation for similar positions at companies in the peer group.
- (2) Mr. Bylund was promoted from Senior Vice President, Operations and Information Technologies to Chief Operating Officer effective January 1, 2022 and his base salary was increased in connection with his promotion.

Annual Cash Incentive Compensation (Short-Term Incentive) Plan

In 2022, NEOs were eligible to earn cash incentive bonuses under the Annual Cash Incentive Compensation Plan ("Plan"), to incentivize and reward NEOs for achieving certain performance goals that drive Company performance, align pay and performance, and support the long-term growth of the Company.

The Company's NEOs, other than the CEO, were eligible to receive annual cash incentive compensation based on achievement of (i) Company-wide performance goals (the "Company Objectives") and (ii) performance objectives tied to individual results for their respective functional areas ("Individual Performance Objectives"). As the Company's current President and CEO, Mr. Hunt is responsible for developing company strategy and overseeing all of the Company's corporate functions, product development and commercial activities. Because of his role and responsibilities, Mr. Hunt's incentive payout is calculated based solely on Company Objectives to closely align his compensation with the Company's performance.

At the beginning of 2022, the Compensation Committee established each NEO's target annual cash incentive compensation ("Target Award") at a level that represents a meaningful portion of each NEO's cash compensation. In addition, the Compensation Committee set threshold, target and maximum performance goals and related payout levels taking into account annual cash incentive compensation levels for comparable positions within our peer group and our own historical practices. An NEO could earn between 0% and 200% of the NEO's Target Award for achievement of Corporate Objectives, dependent upon the level of achieved performance. After the end of fiscal year 2022, the Compensation Committee evaluated achievement of the Company Objectives and each NEO's (other than Mr. Hunt's) Individual Performance Objectives and determined each NEO's annual cash incentive compensation based on such achievement.

Annual Cash Incentive Compensation (Short-Term Incentive) Plan Protocol

The Compensation Committee administers the Plan:

1. At the beginning of the fiscal year, the CEO, with assistance from senior management, proposes annual Company Objectives, Individual Performance Objectives for NEOs other than himself, measurement criteria and weightings, subject to review and approval by the Compensation Committee.
2. At the beginning of the following fiscal year, the CEO evaluates performance levels and the achievement of these annual Company Objectives and Individual Performance Objectives, which are subject to review and approval by the Compensation Committee. Specific bonus award recommendations for all participants (except the CEO) are submitted by the CEO to the Compensation Committee for review and approval.
3. The Compensation Committee determines the size of the overall bonus pool and the bonus awards for individual participants based on the Target Awards, the Company's performance against the Company Objectives and, in the case of executive officers other than the CEO, achievement of Individual Performance Objectives.

Selection of 2021 Performance Measures and Goals

Generally, the Company must attain a minimum level of achievement of its Company Objectives for any payment to be made pursuant to the Plan, and the Compensation Committee may, at its discretion, elect to adjust bonuses downward or not to pay bonuses at all. The Target Award and the weight assigned to Company Objectives and Individual Performance Objectives were determined for each executive officer based upon his or her position and competitive market data derived from our peer group. The final incentive payout is determined for each executive officer based on the achievement of Company Objectives and Individual Performance Objectives (other than for the CEO, whose annual cash incentive is determined based solely on Company Objectives) defined for each organizational level and position and the Target Award.

Our Company is focused on driving above-industry level growth through internal innovation, acquisitions and expansion of applications for our bioprocessing solutions. With our focus on growth, we believe that adjusted revenue and adjusted earnings per share (“EPS”) were relevant targets to reflect topline success, balanced with our ability to leverage investments in research and development (“R&D”), people and capacity. We assigned equal weighting to each of these Company Objectives. We believe our executive team can directly impact these Company Objectives, which drive shareholder value.

Company Objectives

For the 2022 Plan, the Compensation Committee set the following Company Objectives and related payout levels:

- **Adjusted revenue** — The Compensation Committee set challenging adjusted revenue targets for 2022, representing year-over-year growth of 25%, which if achieved would have resulted in a payout of 100% of each NEO’s Target Award with respect to the adjusted revenue metric. If achieved performance was at or below 90% of this adjusted revenue target, then no payout would be made to the NEOs with respect to the adjusted revenue metric. If achieved performance was at or above 120% of the adjusted revenue target, then the annual incentive award would be paid at 200% of the NEO’s Target Award (i.e., maximum payout) with respect to the adjusted revenue metric.
- **Adjusted EPS** — The Compensation Committee also set challenging adjusted EPS targets for 2022, representing a 9% increase year-over-year, which if achieved would have resulted in a payout of 100% of each NEO’s Target Award with respect to the adjusted EPS metric. If achieved performance was at or below 70% of the adjusted EPS goal, then no payout would be made to the NEOs with respect to the adjusted EPS metric. If achieved performance was at or above 130% of the adjusted EPS target, then the annual incentive award would be paid at 200% of the NEO’s Target Award (i.e., maximum payout) with respect to the adjusted EPS metric.

For the 2022 Plan, the Company set for each NEO the following Target Award and weighting for Company Objectives and Individual Performance Objectives:

Individual Annual Cash Incentive Targets⁽¹⁾

Name	Target Award as % of Salary for the Fiscal Year Ended December 31, 2022	Portion Tied to Company Objectives	Portion Tied to Individual Performance Objectives
Tony J. Hunt (2)	100%	100%	0%
Jon K. Snodgres (2)	60%	75%	25%
James R. Bylund (2)	60%	75%	25%
Christine Gebski	50%	75%	25%
Ralf Kuriyel	50%	75%	25%

(1) Each NEO’s cash incentive amount is determined using the following formula: (Base Salary x Bonus Target %) x (Company Objectives %) + (Base Salary x Bonus Target %) x (Performance Objectives Tied to Individual Results %) = Cash Incentive Payment.

(2) In 2022, in light of peer group data collected, we increased the Target Award percentage for Mr. Hunt, Mr. Snodgres and Mr. Bylund from 90%, 50% and 50%, respectively, to 100%, 60% and 60%, respectively.

For 2022, except Mr. Hunt, whose incentive payout is calculated solely based on the aforementioned Company Objectives, the Compensation Committee considered a number of factors to determine if a NEO met his or her Individual Performance Objectives, such as achievement of product development and manufacturing goals, controlling costs and other aspects of expense management, functional team development, and attainment of other strategic objectives of the Company. The NEO’s overall impact to the Company was also taken into consideration.

Achievement of 2022 Company Objectives

The following table summarizes target performance goals for adjusted revenue and adjusted EPS for the fiscal year ended December 31, 2022:

Company Objectives for the Fiscal Year Ended December 31, 2022

Adjusted revenue

Achieve \$840.0 million in adjusted revenue

Adjusted EPS

Achieve \$3.35 of adjusted EPS (fully diluted)

The Compensation Committee reviewed our achievement of the Company Objectives and determined that the Company achieved the Company Objectives at 98% of target levels. The Compensation Committee made this determination in consideration of the adjusted revenue of \$823.4 million and adjusted EPS of \$3.51 for 2022.

The calculations for adjusted revenue and adjusted EPS, on which achievement of Company Objectives is determined, differ from calculations for reported revenue and adjusted EPS as can be found in the Management's Discussion and Analysis of Financial Condition and Results of Operations section of our Form 10-K for the fiscal year ended December 31, 2022, filed with the SEC on February 22, 2023. Specifically, the revenue calculation for purposes of achievement of Company Objectives is adjusted to reflect the impact of (i) any acquisitions completed in the year, and (ii) beginning in 2022, changes in foreign exchange rates. Similarly, the EPS calculation for purposes of achievement of Company Objectives is adjusted to reflect the impact of (i) any acquisitions completed in the year, (ii) changes in foreign exchange rates, and (iii) investment income. The Compensation Committee has determined that these adjustments better reflect the Company's underlying business performance and the efforts of management, as acquisition impacts are outside of the Company's ordinary business, and management has no control over exchange rate fluctuations or investment income impact. The Compensation Committee believes these adjustments are in the best interest of shareholders, as these adjustments help to normalize achievement metrics for extraordinary factors and factors outside of management's control, which may have a favorable or unfavorable impact on Company Objectives.

For 2022, the revenue calculation for purposes of achievement of Company Objectives is adjusted (increased) by \$21.9 million versus our reported revenue of \$801.5 million, to reflect the impact of the change in foreign exchange rates. The adjusted EPS calculation for purposes of achievement of Company Objectives is modified (increased) by a consolidated \$0.24 versus our reported adjusted EPS of \$3.28, to normalize the impacts of investment income and foreign currency exchange.

Achievement of Individual Performance Objectives

In addition to the Company Objectives, NEOs, with the exception of Mr. Hunt, have a component to their annual cash incentive compensation, which is determined based upon achievement of Individual Performance Objectives. Our CEO evaluated the actual performance of the other executive officers against these objectives and submitted such evaluations to the Compensation Committee. The ultimate determination of achievement of the Individual Performance Objectives is at the sole discretion of the Compensation Committee. The performance assessment for the Individual Performance Objectives is not calculated on a line-item basis, but rather represents an overall assessment of how the NEO contributed to the success of the Company through and within his or her area of responsibility. The Individual Performance Objectives are designed to be challenging to achieve at 100%. The Compensation Committee has assessed the attainment of these objectives by Mr. Snodgres, Mr. Bylund, Ms. Gebski and Mr. Kuriyel for 2022 and determined achievement of the Individual Performance Objectives for such NEOs as described below.

As the Company's Chief Financial Officer, Mr. Snodgres is responsible for the Company's internal systems and financial controls. Specifically, Mr. Snodgres' Individual Performance Objectives for 2022 included scaling the Company's global financial organization, the development and successful completion of Phase 4 of the SAP implementation, continued improvements in the Company's financial closing and internal controls processes as well as the continued expansion of both management and external reporting capabilities to enhance business decision making and improve transparency of financial performance. The overall evaluation of achievement of these factors involves both quantitative and qualitative analysis. The CEO evaluated Mr. Snodgres' actual performance against his Individual Performance Objectives, in light of his contributions detailed above, and submitted such evaluation to the Compensation Committee, which determined that the aggregate achievement of the Individual Performance Objectives for Mr. Snodgres was 90%.

Mr. Bylund, the Company's Chief Operating Officer, oversees all operations and IT functions on a global basis. Mr. Bylund's Individual Performance Objectives for 2022 included identifying and driving inorganic business growth opportunities that complement and supplement Company offerings, analyzing and increasing operations capacity to be in line with production capacity targets across all product lines, assessing and continuing to build the operations organization by attracting key talent across the team and driving capital projects that address current as well as future capacity needs. The overall evaluation of achievement of these factors involves both quantitative and qualitative analysis. The CEO evaluated Mr. Bylund's actual performance against his Individual Performance Objectives, in light of his contributions detailed above, and submitted such evaluation to the Compensation Committee, which determined that the aggregate achievement of the Individual Performance Objectives for Mr. Bylund was 200%.

Ms. Gebski, the Company's Senior Vice President of Filtration and Chromatography, oversees the general management and strategy of the Company's upstream and downstream filtration and chromatography portfolio. Ms. Gebski's Individual Performance Objectives for 2022 included achieving the Company's Filtration and Chromatography revenue goals, driving global implementation of dual sourced hollow fiber modules, executing on key filtration product launches to address customer needs, and continuing to build and develop global product management and field applications teams. The overall evaluation of achievement of these factors involves both quantitative and qualitative analysis. The CEO evaluated Ms. Gebski's actual performance against her Individual Performance Objectives in light of her contributions detailed above, and submitted such evaluation to the Compensation Committee, which determined that the aggregate achievement of the Individual Performance Objectives for Ms. Gebski was 135%.

Mr. Kuriyel, the Company's Senior Vice President of Research and Development, is responsible for leading and overseeing the Company's R&D and partnering activities to enhance our portfolio of products and services. Mr. Kuriyel's Individual Performance Objectives for 2022 included developing and launching new products, evaluating and investing in new value-added, differentiated technology for the Company, and scaling the R&D organization to align with the needs of the business. The overall evaluation of achievement of these factors involves both quantitative and qualitative analysis. The CEO evaluated Mr. Kuriyel's actual performance against his Individual Performance Objectives, in light of his contributions detailed above, and submitted such evaluation to the Compensation Committee, which determined that the aggregate achievement of the Individual Performance Objectives for Mr. Kuriyel was 135%.

Annual Bonus Incentive Payments Under the Plan

The table below shows the annual bonus incentive payments made to our NEOs under the Plan for the fiscal year ended December 31, 2022:

Name	Target Award as % of Salary for the Fiscal Year Ended December 31, 2022 (%)	2022 Individual Performance Objectives Results (%) ⁽¹⁾	2022 Company Objectives Results (%) ⁽¹⁾	2022 Bonus Payout (\$) ⁽²⁾	2022 Overall Achievement (% of Target Award) ⁽³⁾
Tony J. Hunt	100	N/A	98	785,440	98
Jon K. Snodgres	60	90	98	268,462	96
James R. Bylund	60	200	98	315,054	124
Christine Gebski	50	135	98	196,251	107
Ralf Kuriyel	50	135	98	200,963	107

- (1) Mr. Hunt's annual bonus incentive payment is calculated solely based on achievement of Company Objectives to closely align his compensation with the Company's performance. The bonus incentive payments made to Mr. Snodgres, Mr. Bylund, Ms. Gebski and Mr. Kuriyel are 25% based on achievement of Individual Performance Objectives and 75% based on achievement of Company Objectives.
- (2) Annual incentive payments under the Plan for the fiscal year 2022 were paid out in March 2023.
- (3) Overall achievement percentage is based on the Target Award.

2022 M&A Integration Cash Incentive Program

In 2022, the Compensation Committee approved a M&A integration cash incentive program, pursuant to which certain employees, including each of the NEOs other than the CEO, were eligible to receive a cash bonus based upon the achievement of individual and functional integration goals related to the 2021 acquisitions. The table below shows the M&A integration cash incentive bonuses made to our NEOs, other than the CEO, for the fiscal year ended December 31, 2022:

Name	2022 M&A Integration Bonus (\$)
Tony J. Hunt	—
Jon K. Snodgres	100,000
James R. Bylund	75,500
Christine Gebski	59,000
Ralf Kuriyel	81,500

Company Objectives for the Fiscal Year Ending December 31, 2023

Our annual cash incentive compensation program for the fiscal year ending December 31, 2023 is generally consistent with the program for the fiscal year ended December 31, 2022. For all NEOs, other than our CEO, the weighting of Company Objectives is 75% and the weighting of Individual Performance Objectives is 25%. The Company will continue to solely rely upon adjusted revenue and adjusted EPS metrics to determine 100% of Mr. Hunt's 2023 annual bonus.

Individual Performance Objectives for the Fiscal Year Ending December 31, 2023

The Individual Performance Objectives considered by the Compensation Committee in determining the cash incentive payments for NEOs other than Mr. Hunt, as appropriate to each NEO's role, are as follows for 2023:

- *Financial Performance* — achieve sales targets, meet gross margin, operating margins, profit and EPS targets, and the Phase 5 SAP implementation.
- *Product Development* — complete launches of next generation KTF systems and new modalities using Avitide ligands. Complete development of mRNA hollow fiber tangential flow filtration systems.
- *Manufacturing and Quality* — increase overall manufacturing capacity, complete multi-site expansions, deploy continuous improvement system at initial sites and continue to recruit and develop leaders and operational functions and support SAP implementation.
- *Sales and Marketing* — integrate and merge all service organizations, drive lab to process scale systems adoptions, build specialist sales force for fluid management, drive strategic and key account sales programs and integrate commercial operating mechanisms across all regions and acquisitions.
- *Business and Corporate Development*—evaluate and execute on new product and acquisition targets, execute on employee programs, including training and leadership skills development.
- *ESG Goals* - reduce company-wide carbon emissions by 10%, expand on our manufacturing waste recycling programs, advance our post-consumer product recycling efforts, complete employee engagement survey, advance professional development programs throughout the organization, and support employee resource groups and community engagement across regions.

Individual Performance Objectives include Company goals overall, beyond the adjusted revenue and adjusted EPS targets that comprise our Company Objectives. Company goals are combined with more tailored individual goals to determine the achievement by each NEO of Individual Performance Objectives.

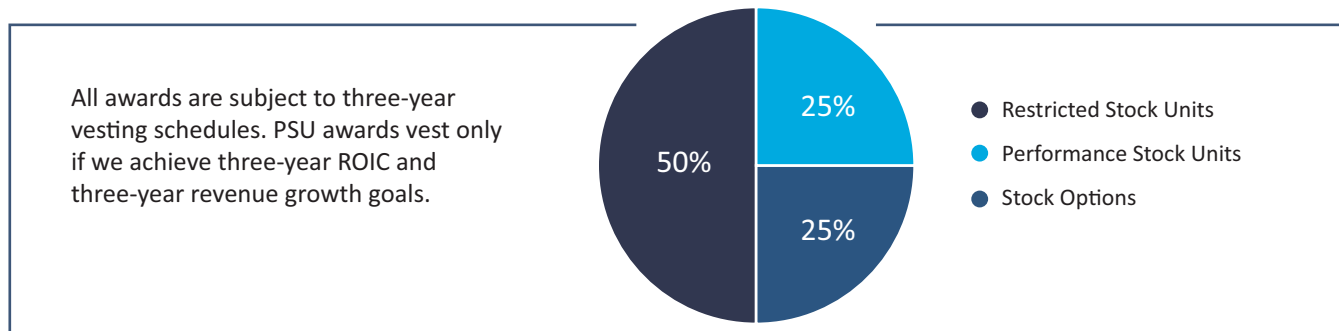
Equity Incentive Compensation

The Compensation Committee believes that equity incentives in the form of stock options and RSUs subject to vesting over time and PSUs are an effective vehicle for long-term compensation. Equity incentives align individual and team performance with the achievement of the Company's strategic and financial goals, long-term value creation, and shareholders' interests. PSUs reward executive officers only if the Company meets certain specified financial and/or operational metrics. Stock options reward executive officers only if the stock price increases from the date of grant over time. RSUs are impacted by all stock price changes, so the value to the executive officers is affected by both increases and decreases in stock price from the market price at the date of grant.

For the fiscal year ended December 31, 2022, the Compensation Committee considered a number of factors in determining what, if any, equity incentive compensation to grant to the executive officers, including:

- the performance of the Company during the fiscal year;
- the number of shares subject to, and exercise price of, outstanding options, both vested and unvested, held by the executive officers;
- the number of RSUs held by the executive officers;
- the vesting schedule of the unvested equity awards held by the executive officers;
- the financial statement impact of any equity award;
- the amount and percentage of the total equity on a diluted basis held by the executive officers; and
- the available shares under the Company's equity incentive plan.

As shown in the following graph, the target split of the annual long-term equity incentive compensation awards made to our NEOs, based upon dollar value, is 25% PSUs, 25% stock options subject to time-based vesting, and 50% RSUs subject to time-based vesting.



In February 2022, the Compensation Committee granted the following long-term incentive compensation awards to each of the NEOs:

Name	Number of Shares		
	Underlying Stock Options (#)	Restricted Stock Units (#)	Target PSUs (#)
Tony J. Hunt	20,307	15,855	7,927
Jon K. Snodgres	4,410	3,443	1,721
James R. Bylund	4,312	3,366	1,683
Christine Gebski	2,721	2,124	1,062
Ralf Kuriyel	2,723	2,126	1,063

Time-based equity awards granted in 2022 vest in equal annual installments over three years following the grant date. PSUs vest 50% based on three-year average base organic revenue growth rate and 50% based on Adjusted Return on Invested Capital ("Adjusted ROIC"), in each case over the three-year performance period from January 1, 2022 to December 31, 2024. We have omitted the specific revenue and Adjusted ROIC targets because they involve confidential financial information, the disclosure of which would result in competitive harm to the Company and would be against industry norms, but we have set such goals at challenging levels and we believe that they are difficult to achieve and would require substantial and sustained performance in order to be achieved at target levels. As a high-growth, acquisitive, innovation-driven company, the Compensation Committee believes revenue growth and Adjusted ROIC are metrics that reflect business performance and that create shareholder value. Linear interpolation shall be applied to determine the percentage of PSUs that vest and are earned where performance falls between the threshold, target and maximum goals. In order for any portion of the PSUs to be earned and vest, threshold performance must be achieved with respect to the relevant goal, and 50% of the target award is earned for threshold performance and 200% of the target award is earned for maximum performance. No more than 200% of the target award can be earned.

2022 Additional Grants Related to the Integration of 2021 Acquisitions

In 2022, the Compensation Committee granted the NEOs, other than our CEO, PSUs related to the integration efforts for the 2021 acquisitions. Mr. Snodgres and Mr. Bylund each received 1,000 PSUs and Ms. Gebski and Mr. Kuriyel received 750 PSUs each. In order for the NEOs to earn 100% of these PSUs on the first anniversary of the grant date, the 2022 cumulative revenue and gross margin targets for the 2021 acquisitions of Polymem, Avitide and BioFlex must be met. The Compensation Committee made incremental grants in light of recent acquisitions to help drive integration goals. Based on achievement of performance metrics, Mr. Snodgres and Mr. Bylund each received 625 shares (or 62.5% attainment of the target amount) and Ms. Gebski and Mr. Kuriyel each received 375 shares (or 50% attainment of the target amount).

2023 Long-term Equity Incentive Compensation

In March 2023, the Compensation Committee granted long-term incentive compensation awards to each of the NEOs. Consistent with the Company's increased emphasis on performance-based incentives, as described above, these awards are split based upon dollar value between PSUs (25%), stock options subject to time-based vesting (25%) and RSUs subject to time-based vesting (50%), all of which are subject to vesting over three years. The PSUs vest only if the Company achieves specified three-year Adjusted ROIC goals and revenue growth goals.

Clawback Policy

In February 2019, the Compensation Committee adopted a clawback policy that covers cash and equity incentive compensation paid to the Company's executive officers. The policy provides that if the Company is required to prepare an accounting restatement due to the Company's material non-compliance with any financial reporting requirement and/or intentional misconduct by a covered executive officer, the Compensation Committee may require the covered executive officer to repay to us any excess compensation received by the covered executive officer during the three fiscal years preceding the publication of any such restated financial statements. For purposes of this policy, excess compensation means annual cash bonus and long-term equity incentive compensation that is more than the amount such covered executive officer would have received if the annual cash bonus and/or long-term equity incentive compensation had been determined based on the financial results reported in the restated financial statement.

In October 2022, the SEC approved final rules implementing Section 10D of the Securities and Exchange Act of 1934, requiring listing exchanges to adopt new listing standards, which will require listed companies to adopt and comply with clawback policies in accordance with the new listing standards. In light of the SEC's adoption of these rules, we intend to update our clawback policy to comply with applicable Nasdaq listing rules when effective.

Other Compensation

All full-time employees, including the executive officers, are eligible to participate in the Company's health and welfare benefit programs, including medical, dental and vision care coverage, disability and life insurance and the Company's 401(k) plan. Under the 401(k) plan, the Company matches 50% of the first 6% of eligible compensation contributed by employees subject to a maximum of \$5,000 per year.

Tax and Accounting Considerations

We have not provided or agreed to provide any of the Company's executive officers or directors with a gross-up or other reimbursement for tax amounts they might pay pursuant to Section 4999 or Section 409A of the Internal Revenue Code of 1986, as amended (the "Code"). Sections 280G and 4999 of the Code provide that executive officers and directors who hold significant shareholder interests and certain other service providers could be subject to significant additional taxes if they receive payments or benefits in connection with a change in control of the Company that exceed certain limits, and that we or our successor could lose a deduction on the amounts subject to the additional tax. Section 409A also imposes additional significant taxes on the individual in the event that an employee, director or service provider receives "deferred compensation" that is not exempt from or does not meet the requirements of Section 409A.

For the Company's financial statements, cash compensation, such as salary and bonus, is expensed. For income tax returns, cash compensation is generally deductible except as set forth below. For equity-based compensation, we expense the fair value of such grants over the requisite service period.

Generally, Section 162(m) of the Code disallows a federal income tax deduction for public corporations of remuneration in excess of \$1 million paid for any fiscal year to a "covered employee" of the Company. With respect to taxable years beginning before January 1, 2018, remuneration in excess of \$1 million was exempt from this deduction limit if it qualified as "performance-based compensation" within the meaning of Section 162(m).

The Compensation Committee believes that shareholder interests are best served if the Compensation Committee retains maximum flexibility to design executive compensation programs that meet stated business objectives. For these reasons, the Compensation Committee, while considering tax deductibility as a factor in determining executive compensation, may not limit such compensation to those levels that will be deductible, particularly in light of the expansion of the covered employee group and the elimination of the exception for performance-based compensation.

Compensation Risk Assessment

The Compensation Committee not only considers and evaluates risks related to the Company's cash and equity-based compensation programs and practices, but also evaluates whether the Company's compensation plans encourage participants to take excessive risks that are reasonably likely to have a material adverse effect on the Company. Consistent with SEC disclosure requirements, the Compensation Committee has worked with management to assess compensation policies and practices for Company employees and has concluded that such policies and practices do not create risks that are reasonably likely to have a material adverse effect on the Company.

EXECUTIVE COMPENSATION TABLES

COMPENSATION EARNED

The following table summarizes the compensation earned during the fiscal years indicated below by the Company's Chief Executive Officer ("CEO"), Chief Financial Officer and the three other most highly compensated executive officers who were serving as an executive officer as of December 31, 2022 and whose total compensation exceeded \$100,000. These individuals are referred to as the Company's NEOs.

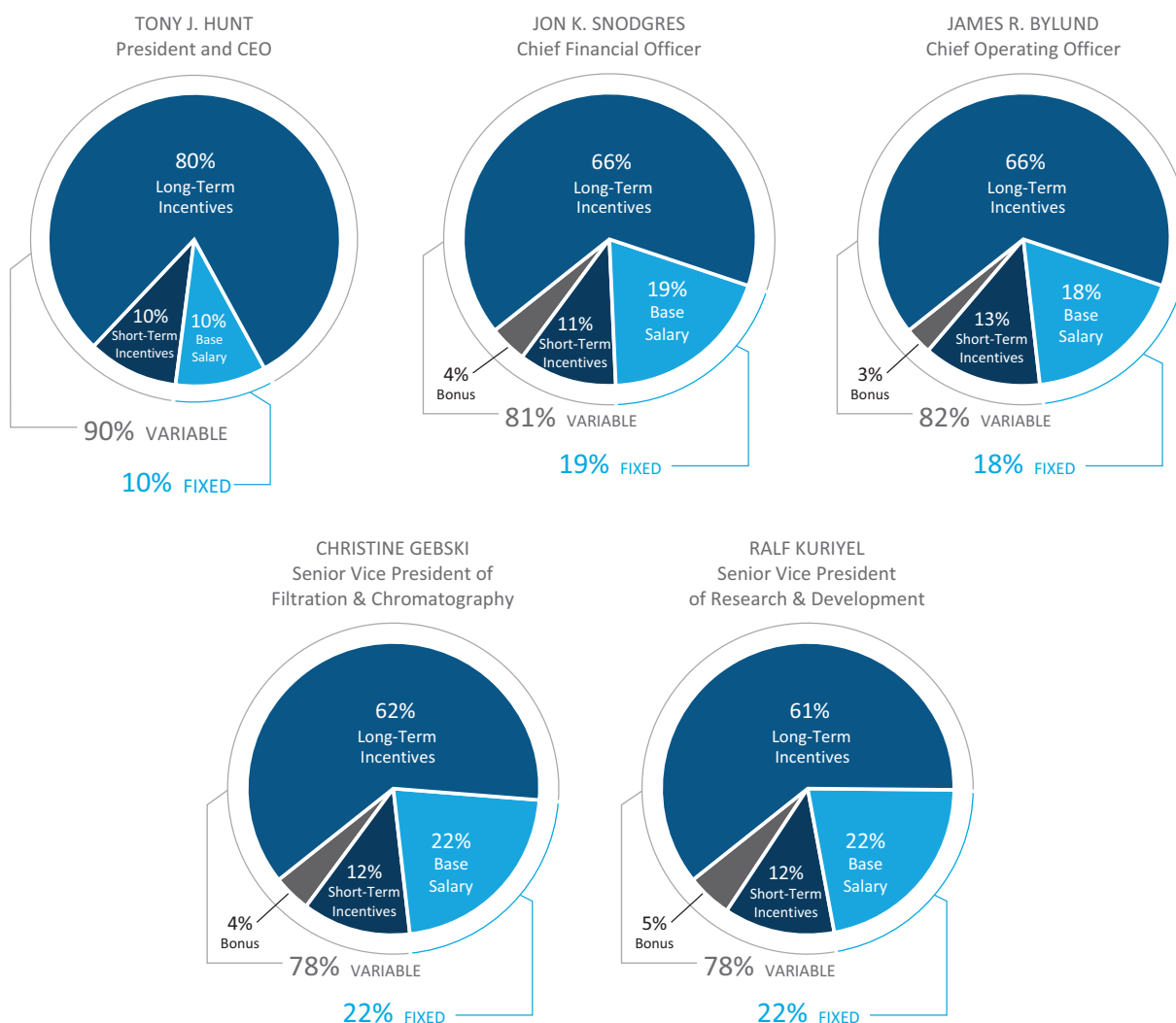
2022 Summary Compensation Table

Name	Year (1)	Salary (\$)	Bonus (\$) ⁽²⁾	Stock Awards (\$) ⁽³⁾	Option Awards (\$) ⁽³⁾	Non-Equity Incentive Plan Compensation (\$) ⁽⁴⁾	All Other Compensation (\$) ⁽⁵⁾	Total (\$)
Tony J. Hunt	2022	800,000	—	4,499,792	1,623,698	785,440	5,000	7,713,930
<i>President and CEO</i>	2021	761,000	—	4,499,801	1,163,714	1,335,555	5,000	7,765,070
	2020	725,000	—	3,200,079	757,232	378,750	5,000	5,066,061
Jon K. Snodgres	2022	465,426	100,000	1,235,040	352,613	268,462	5,000	2,426,541
<i>Chief Financial Officer</i>	2021	432,954	—	1,243,406	268,741	422,130	5,000	2,372,231
	2020	393,594	—	1,106,902	190,937	295,196	5,000	1,991,629
James R. Bylund	2022	424,710	75,500	1,213,281	344,777	315,054	5,000	2,378,323
<i>Chief Operating Officer</i>	2021	363,000	—	930,383	187,749	357,555	5,000	1,843,687
Christine Gebski	2022	365,508	59,000	796,293	217,564	196,251	5,000	1,639,616
<i>Senior Vice President of Filtration & Chromatography</i>	2021	351,450	—	804,946	181,747	328,606	5,000	1,671,749
Ralf Kuriyel	2022	374,286	81,500	796,861	217,724	200,963	5,000	1,676,334
<i>Senior Vice President of Research and Development</i>	2021	363,384	—	829,091	187,934	339,764	5,000	1,725,173
	2020	343,080	—	553,795	131,037	294,168	5,000	1,327,080

- (1) James R. Bylund and Christine Gebski were appointed as executive officers in 2021.
- (2) Amounts listed represent M&A integration cash incentive bonuses made with respect to 2022, as described above. In March 2023, the Company awarded discretionary bonuses to Mr. Snodgres, Mr. Bylund, Ms. Gebski and Mr. Kuriyel upon achievement of individual and functional integration goals related to the 2021 acquisitions.
- (3) Represents the aggregate grant date fair value for awards granted in the respective fiscal years calculated in accordance with the Financial Accounting Standards Board Accounting Standards Codification No. 718, "Compensation – Stock Compensation (Topic 718)" ("ASC Topic 718"). The assumptions the Company used for calculating the grant date fair values are set forth in Note 2, "Summary of Significant Accounting Policies – Stock Based Compensation" to the Company's consolidated financial statements included in the Company's Form 10-K for the fiscal year ended December 31, 2022, filed on February 22, 2023. The values reported for the PSUs granted to Mr. Hunt, Mr. Snodgres, Mr. Bylund, Ms. Gebski and Mr. Kuriyel in 2022 represent the grant date fair values of awards assuming the probable outcome of the performance conditions, which was deemed to be at the 55% level of achievement. The value of the PSUs granted in 2022 assuming the maximum achievement of the performance conditions is, \$3,064,225 for Mr. Hunt, \$909,221 for Mr. Snodgres, \$894,841 for Mr. Bylund, \$394,411 for Ms. Gebski and \$595,730 for Mr. Kuriyel.
- (4) Amounts listed represent payments made with respect to the year indicated under the Plan, as described above.
- (5) Represents the match paid by the Company on behalf of such individual into the Repligen Corporation 401(k) Savings Plan on 50% of the first 6% of eligible compensation contributed by such individual subject to a maximum of \$5,000 per year for the years indicated.

The following graphs reflect the allocation of salary, equity incentive compensation, cash incentive compensation, and other compensation earned by the Company's NEOs in the fiscal year 2022 as set forth in the 2022 Summary Compensation Table above:

2022 Summary Compensation Allocations



The following table sets forth the total compensation earned by the NEOs during 2022. For more information on the total compensation see "Executive Compensation Tables—2022 Summary Compensation Table" on page 48.

	Tony J. Hunt	Jon K. Snodgres	James R. Bylund	Christine Gebski	Ralf Kuriyel
Title	President & CEO	Chief Financial Officer	Chief Operating Officer	Senior Vice President of Filtration & Chromatography	Senior Vice President of Research & Development
Total 2022 Compensation	\$7,713,930	\$2,426,541	\$2,378,323	\$1,639,616	\$1,676,334

GRANTS OF PLAN-BASED AWARDS FOR THE FISCAL YEAR ENDED DECEMBER 31, 2022

The table below sets forth grants of plan-based awards that were made in the fiscal year ended December 31, 2022 to the Company's NEOs.

Name	Grant Date	Estimated Potential Payouts Under Non-Equity Incentive Plan Awards: Threshold (\$) ⁽¹⁾⁽²⁾	Estimated Potential Payouts Under Non-Equity Incentive Plan Awards: Target (\$) ⁽¹⁾⁽²⁾	Estimated Potential Payouts Under Non-Equity Incentive Plan Awards: Maximum (\$) ⁽¹⁾⁽⁴⁾	Estimated Future Payouts Under Equity Incentive Plan Awards: Threshold (#) ⁽⁵⁾	Estimated Future Payouts Under Equity Incentive Plan Awards: Target (#) ⁽⁵⁾	Estimated Future Payouts Under Equity Incentive Plan Awards: Maximum (#) ⁽⁵⁾	All Other Stock Awards: Number of Shares or Units (#)	All Other Option Awards: Number of Underlying Options (#)	Exercise or Base Price of Option Awards (\$/Share)	Grant Date Fair Value of Stock and Option Awards (\$)
Tony J. Hunt		560,000	800,000	1,600,000	—	—	—	—	—	—	—
	2/24/2022	—	—	—	—	—	—	—	20,307	189.21	1,623,983
	2/24/2022	—	—	—	3,964	7,927	15,854	15,855	—	—	2,999,925
Jon K. Snodgres		216,423	279,256	558,511	—	—	—	—	—	—	—
	1/1/2022	—	—	—	—	1,000	1,000	—	—	—	257,960
	2/24/2022	—	—	—	—	—	—	—	4,410	189.21	352,675
	2/24/2022	—	—	—	—	—	—	3,443	—	—	651,450
James R. Bylund		197,490	254,826	509,652	861	1,721	3,442	—	—	—	325,630
	1/1/2022	—	—	—	—	1,000	1,000	—	—	—	257,960
	2/24/2022	—	—	—	—	—	—	—	4,312	189.21	344,837
	2/24/2022	—	—	—	—	—	—	3,366	—	—	636,881
Christine Gebski		141,634	182,754	365,508	842	1,683	3,366	—	—	—	318,440
	1/1/2022	—	—	—	—	750	750	—	—	—	193,470
	2/24/2022	—	—	—	—	—	—	—	2,721	189.21	217,603
	2/24/2022	—	—	—	—	—	—	2,124	—	—	401,882
Ralf Kuriyel		145,036	187,143	374,286	531	1,062	2,124	—	—	—	200,941
	1/1/2022	—	—	—	—	750	750	—	—	—	193,470
	2/24/2022	—	—	—	—	—	—	—	2,723	189.21	217,763
	2/24/2022	—	—	—	532	1,063	2,126	2,126	—	—	402,260

- Mr. Hunt's non-equity incentive plan award is calculated solely based on achievement of Company Objectives. Mr. Snodgres', Mr. Bylund's, Ms. Gebski's and Mr. Kuriyel's non-equity incentive plan awards are calculated 25% based on achievement of Individual Performance Objectives and 75% based on achievement of Company Objectives.
- The amounts represent a threshold bonus, assuming 70% achievement of the Company Objectives for Mr. Hunt, and 70% achievement of the Company Objectives and 100% achievement of the Individual Performance Objectives for Mr. Snodgres, Mr. Bylund, Ms. Gebski and Mr. Kuriyel.
- The amounts represent the target bonus, assuming 100% achievement of the Company Objectives for Mr. Hunt and 100% achievement of the Company Objectives and 100% achievement of the Individual Performance Objectives for Mr. Snodgres, Mr. Bylund, Ms. Gebski and Mr. Kuriyel. The actual bonus awarded by the Compensation Committee can be higher or lower than the target depending on achievement of Company Objectives and Individual Performance Objectives. The actual amounts awarded for 2022 performance are listed in the Non-Equity Incentive Plan Compensation column of the Summary Compensation Table.
- The amounts represent a maximum bonus, assuming 200% achievement of the Company Objectives for Mr. Hunt and 200% achievement of the Company Objectives and Individual Performance Objectives for Mr. Snodgres, Mr. Bylund, Ms. Gebski and Mr. Kuriyel.
- In January 2022, Mr. Snodgres, Mr. Bylund, Ms. Gebski and Mr. Kuriyel were each granted one-time PSU awards that vested on December 31, 2022, based on the achievement of specified goals related to the integration of the 2021 acquisitions. In February 2022, Mr. Hunt, Mr. Snodgres, Mr. Bylund, Ms. Gebski and Mr. Kuriyel were granted PSUs that vest upon the Company's achievement of specified revenue growth and Adjusted ROIC targets over the three-year performance period.

Discussion of Summary Compensation Table and Grants of Plan-Based Awards Table

The Company's executive compensation policies and practices, pursuant to which the compensation set forth in the Summary Compensation Table and the Grants of Plan-Based Awards Table was paid or awarded, are described above under "Compensation Discussion and Analysis." The material terms of employment agreements and arrangements with the Company's NEOs are described below under the heading "Employment Arrangements."

OUTSTANDING EQUITY AWARDS AT DECEMBER 31, 2022

The following table sets forth certain information regarding the outstanding stock options and stock awards held by the NEOs on December 31, 2022. Awards were made under the Repligen Corporation 2018 Stock Option and Incentive Plan (the “2018 Plan”) and the Repligen Corporation Amended and Restated 2012 Stock Option and Incentive Plan, as amended (the “2012 Plan”). For the outstanding stock options and stock awards described below, vesting is conditioned on the NEO remaining in service to the Company through such vesting date. Such awards may also be subject to accelerated vesting as described in “Employment Arrangements—Potential Payments Upon Termination or Change in Control” on page 54.

Name	Grant Date	Option Awards				Stock Awards				
		Number of Securities Unexercised Options Exercisable (#)	Number of Securities Underlying Unexercised Options (#)	Option Exercise Price (\$)	Option Expiration Date	Number of Shares or Units of Stock that Have Not Vested (#)	Market Value of Shares or Units of Stock that Have Not Vested (\$) ⁽¹⁾	Equity Incentive Plan Awards: Number of Unearned Shares, Units or Other Rights that Have Not Vested (#)	Equity Incentive Plan Awards: Market or Payout Value of Unearned Shares, Units or Other Rights that Have Not Vested (\$) ⁽¹⁾	
Tony J. Hunt	3/1/2018	126,916	158,647 ⁽²⁾	33.87	2/29/2028	—	—	—	—	
	3/1/2018	34,246	—	33.87	2/29/2028	—	—	—	—	
	3/1/2018	—	—	—	—	82,013 ⁽³⁾	13,885,621	—	—	
	2/28/2019	21,756	—	59.52	2/28/2029	—	—	—	—	
	2/27/2020	12,085	6,043 ⁽⁴⁾	86.10	2/27/2030	—	—	—	—	
	2/27/2020	—	—	—	—	6,195 ⁽⁵⁾	1,048,875	—	—	
	2/27/2020	—	—	—	—	—	—	18,584 ⁽⁶⁾	3,146,457	
	2/24/2021	4,200	8,401 ⁽⁷⁾	215.58	2/24/2031	—	—	—	—	
	2/24/2021	—	—	—	—	6,958 ⁽⁸⁾	1,178,059	—	—	
	2/24/2021	—	—	—	—	—	—	10,436 ⁽⁹⁾	1,766,919	
	2/24/2022	—	20,307 ⁽¹⁰⁾	189.21	2/24/2032	—	—	—	—	
	2/24/2022	—	—	—	—	15,855 ⁽¹¹⁾	2,684,410	—	—	
	2/24/2022	—	—	—	—	—	—	7,927 ⁽¹²⁾	1,342,120	
Jon K. Snodgres	3/1/2018	13,707	—	33.87	2/29/2028	—	—	—	—	
	2/28/2019	2,108	—	59.52	2/28/2029	—	—	—	—	
	5/13/2019	—	—	—	—	3,200 ⁽¹³⁾	541,792	—	—	
	2/27/2020	—	1,524 ⁽¹⁴⁾	86.10	2/27/2030	—	—	—	—	
	2/27/2020	—	—	—	—	1,562 ⁽¹⁵⁾	264,462	—	—	
	2/27/2020	—	—	—	—	—	—	8,170 ⁽⁶⁾	1,383,263	
	2/24/2021	—	1,940 ⁽¹⁶⁾	215.58	2/24/2031	—	—	—	—	
	2/24/2021	—	—	—	—	1,607 ⁽¹⁷⁾	272,081	—	—	
	2/24/2021	—	—	—	—	—	—	2,410 ⁽⁹⁾	408,037	
	1/1/2022	—	—	—	—	—	—	— ⁽¹⁸⁾	—	
	1/1/2022	—	—	—	—	—	—	375 ⁽¹⁹⁾	63,491	
	1/1/2022	—	—	—	—	—	—	250 ⁽¹⁹⁾	42,327	
	2/24/2022	—	4,410 ⁽²⁰⁾	189.21	2/24/2032	—	—	—	—	
2/24/2022	—	—	—	—	3,443 ⁽²¹⁾	582,934	—	—		
2/24/2022	—	—	—	—	—	—	1,721 ⁽¹²⁾	291,383		
James Bylund	4/1/2020	2,000	6,000 ⁽²²⁾	94.33	4/1/2030	—	—	—	—	
	4/1/2020	—	—	—	—	3,000 ⁽²³⁾	507,930	—	—	
	2/24/2021	677	1,356 ⁽²⁴⁾	215.58	2/24/2031	—	—	—	—	
	2/24/2021	—	—	—	—	1,123 ⁽²⁵⁾	190,135	—	—	
	2/24/2021	—	—	—	—	—	—	1,684 ⁽⁹⁾	285,118	
	1/1/2022	—	—	—	—	—	—	— ⁽¹⁸⁾	—	
	1/1/2022	—	—	—	—	—	—	375 ⁽¹⁹⁾	63,491	
	1/1/2022	—	—	—	—	—	—	250 ⁽¹⁹⁾	42,327	
	2/24/2022	—	4,312 ⁽²⁶⁾	189.21	2/24/2032	—	—	—	—	
	2/24/2022	—	—	—	—	3,366 ⁽²⁷⁾	569,897	—	—	
	2/24/2022	—	—	—	—	—	—	1,683 ⁽¹²⁾	284,949	
	Christine Gebski	2/28/2019	—	—	—	—	1,785 ⁽²⁸⁾	302,218	—	—
		5/13/2019	—	—	—	—	2,000 ⁽²⁹⁾	338,620	—	—
2/27/2020		—	—	—	—	2,759 ⁽³⁰⁾	467,126	—	—	
2/24/2021		656	1,312 ⁽³¹⁾	215.58	2/24/2031	—	—	—	—	
2/24/2021		—	—	—	—	1,087 ⁽³²⁾	184,040	—	—	
2/24/2021		—	—	—	—	—	—	1,630 ⁽⁹⁾	275,975	
1/1/2022		—	—	—	—	—	—	750 ⁽¹⁹⁾	126,982	
2/24/2022		—	2,721 ⁽³³⁾	189.21	2/24/2032	—	—	—	—	
2/24/2022		—	—	—	—	2,124 ⁽³⁴⁾	359,614	—	—	
2/24/2022		—	—	—	—	—	—	1,062 ⁽¹²⁾	179,807	
Ralf Kuriyel		5/13/2019	—	—	—	—	3,200 ⁽¹³⁾	541,792	—	—
		2/27/2020	400	1,046 ⁽³⁵⁾	86.10	2/27/2030	—	—	—	—
		2/27/2020	—	—	—	—	1,072 ⁽³⁶⁾	181,500	—	—
	2/27/2020	—	—	—	—	—	—	3,216 ⁽⁶⁾	544,501	
	2/24/2021	678	1,357 ⁽³⁷⁾	215.58	2/24/2031	—	—	—	—	
	2/24/2021	—	—	—	—	1,124 ⁽³⁸⁾	190,304	—	—	
	2/24/2021	—	—	—	—	—	—	1,686 ⁽⁹⁾	285,457	
	1/1/2022	—	—	—	—	—	—	— ⁽¹⁸⁾	—	
	1/1/2022	—	—	—	—	—	—	375 ⁽¹⁹⁾	63,491	
	2/24/2022	—	2,723 ⁽³⁹⁾	189.21	2/24/2032	—	—	—	—	
	2/24/2022	—	—	—	—	2,126 ⁽⁴⁰⁾	359,953	—	—	
	2/24/2022	—	—	—	—	—	—	1,063 ⁽¹²⁾	179,977	

(1) The value of equity awards is based on the closing of the Company’s stock on the Nasdaq Global Select Market on December 30, 2022, the last trading day of 2022, which was \$169.31.
(2) 31,730 shares vested on March 1, 2023 and 31,729 shares vest annually from March 1, 2024 to March 1, 2026. 31,730 shares vest on March 1, 2027.
(3) 16,402 shares vested on March 1, 2023 and 16,403 shares vest on each of March 1, 2024, March 1, 2026 and March 1, 2027. 16,402 shares vest on March 1, 2025.
(4) 6,043 shares vested on February 27, 2023.

- (5) 6,195 shares vested on February 27, 2023.
- (6) The shares subject to this award vested on February 27, 2023 based upon maximum achievement of specified revenue growth and Adjusted ROIC goals by the Company over the three-year performance period as specified by the Compensation Committee and described under the "Compensation Discussion and Analysis – Equity Incentive Compensation" section beginning on page 46 of this report.
- (7) 4,200 shares vested on February 24, 2023 and 4,201 shares vest on February 24, 2024.
- (8) 3,479 shares vested on February 24, 2023 and 3,479 shares vest on February 24, 2024.
- (9) The shares subject to this award vest on February 24, 2024 assuming maximum achievement of specified revenue growth and Adjusted ROIC goals by the Company over the three-year performance period as specified by the Compensation Committee and described under the "Compensation Discussion and Analysis – Equity Incentive Compensation" section beginning on page 46 of this report.
- (10) 6,769 shares vested on February 24, 2023 and 6,769 shares vest on each of February 24, 2024 and February 24, 2025.
- (11) 5,285 shares vested on February 24, 2023 and 5,285 shares vest on each of February 24, 2024 and February 24, 2025.
- (12) The shares subject to this award vest on February 24, 2025 assuming target achievement of specified revenue growth and Adjusted ROIC goals by the Company over the three-year performance period as specified by the Compensation Committee and described under the "Compensation Discussion and Analysis – Equity Incentive Compensation" section beginning on page 46 of this report.
- (13) 1,600 shares vest on each of May 13, 2023 and May 13, 2024.
- (14) 1,524 shares vested on February 27, 2023.
- (15) 1,562 shares vested on February 27, 2023.
- (16) 970 shares vested on February 24, 2023 and 970 shares vest on February 24, 2024.
- (17) 803 shares vested on February 24, 2023 and 804 shares vest on February 24, 2024.
- (18) The shares subject to this award vested on December 31, 2022 (issued on March 3, 2023 once approved by the Compensation Committee), based upon threshold achievement of specified goals related to the integration of the 2021 acquisitions as specified by the Compensation Committee and described under "Compensation Discussion and Analysis – Equity Incentive Compensation" beginning on page 46 of this report.
- (19) The shares subject to this award vested on December 31, 2022 (issued on March 3, 2023 once approved by the Compensation Committee), based upon target achievement of specified goals related to the integration of the 2021 acquisitions as specified by the Compensation Committee as described under "Compensation Discussion and Analysis – Equity Incentive Compensation" beginning on page 46.
- (20) 1,470 shares vested on February 24, 2023 and 1,470 shares vest on each of February 24, 2024 and February 24, 2025.
- (21) 1,147 shares vested on February 24, 2023 and 1,148 shares vest on each of February 24, 2024 and February 24, 2025.
- (22) 2,000 shares vest annually from April 1, 2023 to April 1, 2025.
- (23) 1,000 shares vest annually from April 1, 2023 to April 1, 2025.
- (24) 678 shares vested on February 24, 2023. 678 shares vest on February 24, 2024.
- (25) 561 shares vested on February 24, 2023. 562 shares vest on February 24, 2024.
- (26) 1,437 shares vested on February 24, 2023. 1,437 shares vest on February 24, 2024 and 1,438 shares vest on February 24, 2025.
- (27) 1,122 shares vested on February 24, 2023. 1,122 shares vest on each of February 24, 2024 and February 24, 2025.
- (28) 1,785 shares vested on February 28, 2023.
- (29) 1,000 shares vest on each of May 13, 2023 and May 13, 2024.
- (30) 1,379 shares vested on February 27, 2023. 1,380 shares vest on February 27, 2024.
- (31) 656 shares vested on February 24, 2023. 656 shares vest on February 24, 2024.
- (32) 543 shares vested on February 24, 2023. 544 shares vest on February 24, 2024.
- (33) 907 shares vested on February 24, 2023. 907 shares vest on each of February 24, 2024 and February 24, 2025.
- (34) 708 shares vested on February 24, 2023. 708 shares vest on each of February 24, 2024 and February 24, 2025.
- (35) 1,046 shares vested on February 27, 2023.
- (36) 1,072 shares vested on February 27, 2023.
- (37) 678 shares vested on February 24, 2023. 679 shares vest on February 24, 2024.
- (38) 562 shares vested on February 24, 2023. 562 shares vest on February 24, 2024.
- (39) 907 shares vested on February 24, 2023. 908 shares vest on each of February 24, 2024 and February 24, 2025.
- (40) 708 shares vested on February 24, 2023. 709 shares vest on each of February 24, 2024 and February 24, 2025.

OPTION EXERCISES AND STOCK VESTED FOR THE FISCAL YEAR ENDED DECEMBER 31, 2022

The following table sets forth certain information regarding the number of stock options exercised, RSUs and PSUs that vested and amounts realized by the NEOs in the year ended December 31, 2022.

Name	Option Awards		Stock Awards	
	Number of Shares Acquired on Exercise (#)	Value Realized on Exercise (\$) ⁽¹⁾	Number of Shares Acquired on Vesting (#)	Value Realized on Vesting (\$) ⁽²⁾
Tony J. Hunt	55,154	9,432,372	63,711	12,254,185
Jon K. Snodgres	8,649	1,127,148	12,761	2,353,393
James R. Bylund	2,000	292,130	2,461	451,785
Christine Gebski	—	—	5,157	929,610
Ralf Kuriyel	4,000	814,229	9,330	1,702,097

(1) The value realized on exercise of an option award is based on the difference between the fair market value of Common Stock on the date of exercise and the exercise price of the option.

(2) The value realized on vesting of RSUs and PSUs is based on the closing price of Common Stock on the trading date immediately preceding the date of vesting.

PENSION BENEFITS

The Company has no defined benefit plans or other supplemental retirement plans for the NEOs.

NONQUALIFIED DEFERRED COMPENSATION

The Company has no nonqualified defined contribution plans or other nonqualified deferred compensation plans for the NEOs.

EMPLOYMENT ARRANGEMENTS

Third Amended and Restated Employment Agreement with Mr. Hunt

CEO Termination without Cause or Resignation for Good Reason

On May 26, 2022, the Company entered into a Third Amended and Restated Employment Agreement (the "Employment Agreement") with Mr. Hunt. Pursuant to the terms of the Employment Agreement, in the event that Mr. Hunt's employment is terminated by the

Company without cause or he resigns for good reason, each as defined in the Employment Agreement, subject to the execution and effectiveness of a separation agreement containing, among other things, a general release of claims in favor of the Company, Mr. Hunt will be entitled to receive (i) continued payment of his base salary at the rate then in effect for 12 months following termination, (ii) acceleration of 50% of his unvested stock options and other unvested stock-based awards subject solely to time-based vesting, with the exception of the one-time special award granted to him in 2018, (iii) a pro-rata portion of his stock options and other stock-based awards that are subject to performance-based vesting and for which achievement of the performance metrics has not been determined as of the date of termination shall remain eligible to vest at the end of the performance period based on actual performance through the end of the performance period, and (iv) if Mr. Hunt is enrolled in the Company's group health care programs immediately prior to the date of termination and properly elects to receive COBRA benefits, payment of the COBRA premiums by the Company for up to 12 months following termination. Pro-rata for purposes of item (iii) of the preceding sentence shall be determined based on the number of full months elapsed in the vesting period or performance period, as applicable, through the date of termination relative to the total number of full months in the vesting period or performance period, as applicable.

CEO Termination without Cause or Resignation for Good Reason Following Change in Control

If Mr. Hunt's employment is terminated by the Company without cause or he resigns for good reason, in either case within 24 months following a change in control, as defined in the Employment Agreement, subject to the execution and effectiveness of a separation agreement containing, among other things, a general release of claims in favor of the Company, Mr. Hunt will be entitled to receive (i) a lump sum amount in cash equal to two times the sum of his base salary at the rate then in effect (or at the rate in effect immediately prior to the change in control, if higher) and his target annual performance bonus for the year in which the date of termination occurs, (ii) a pro-rata portion of his target bonus for the year in which the date of termination occurs, (iii) in the event that stock options and other stock-based awards are assumed, continued or substituted in the change in control, accelerated vesting of (A) 100% of his unvested stock options and other unvested stock-based awards subject solely to time-based vesting, other than the special award and all of his stock options and other stock-based awards that are subject to performance-based vesting, with performance metrics deemed to be met at the greater of the target level of performance or the actual level of performance on the date of termination and (iv) if Mr. Hunt is enrolled in the Company's group health care programs immediately prior to the date of termination and properly elects to receive COBRA benefits, payment of the COBRA premiums by the Company for up to 18 months following termination.

Change in Control

In the event of a change in control, any then unvested portion of the special award granted to Mr. Hunt in 2018 shall vest as of immediately prior to such change in control. In addition, the event that any then-outstanding stock options and stock-based awards are not assumed, continued or substituted in such change in control, then Mr. Hunt will be entitled to accelerated vesting of (i) 100% of his unvested stock options and other unvested stock-based awards subject solely to time-based vesting, other than the special award, and (ii) accelerated vesting of all of his stock options and other stock-based awards that are subject to performance-based vesting, with performance metrics deemed to be met at the greater of the target level of performance or the actual level of performance, as of the date of the change in control.

Amended and Restated Severance and Change in Control Plan

NEO Termination without Cause or Resignation for Good Reason

On May 26, 2022, the Company adopted the Amended and Restated Severance and Change in Control Plan (the "Severance Plan"), pursuant to which the NEOs other than Mr. Hunt may be eligible for certain severance payments and benefits. Pursuant to the terms of the Severance Plan, in the event that Mr. Snodgres', Mr. Bylund's, Ms. Gebski's or Mr. Kuriyel's employment is terminated by the Company without cause or one resigns for good reason, each as defined in the Severance Plan, subject to the execution and effectiveness of a separation agreement containing, among other things, a general release of claims in favor of the Company, the NEO will be entitled to receive (i) continued payment of base salary at the rate then in effect for 12 months following termination (provided, however, such amount shall be reduced by an amount equal to the dollar value of the portion of the monthly premiums paid by active employees for coverage under the Company's group health care programs multiplied by 12), (ii) except as otherwise provided in the applicable equity award agreement, accelerated vesting of (A) 50% of his or her unvested stock options subject to time-based vesting, and (B) a pro-rata portion of his or her unvested stock-based awards subject solely to time-based vesting, (iv) a pro-rata portion of unvested stock options and other stock-based awards that are subject to performance-based vesting and for which achievement of the performance metrics has not been determined as of the date of termination shall remain eligible to vest at the end of the performance period based on actual performance through the end of the performance period and (v) if the NEO is enrolled in the Company's group health care programs immediately prior to the date of termination and properly elects to receive COBRA benefits, payment of the COBRA premiums by the Company for up to 12 months following termination. Pro-rata for purposes of items (iii)(B) and (iv) of the preceding sentence shall be determined based on the number of full months elapsed in the vesting period or performance period, as applicable, through the date of termination relative to the total number of full months in the vesting period or performance period, as applicable.

NEO Termination without Cause or Resignation for Good Reason Following Change in Control

If Mr. Snodgres', Mr. Bylund's, Ms. Gebski's or Mr. Kuriyel's employment is terminated by the Company without cause or if one resigns for good reason, in either case within two years following a change in control, as defined in the Severance Plan, subject to the execution and effectiveness of a separation agreement containing, among other things, a general release of claims in favor of the Company, that NEO will be entitled to receive (i) a lump sum payment equal to one-and-a-half times the sum of the NEO's base salary at the rate then in effect (or the rate in effect immediately prior to the change in control, if higher) and his or her target annual performance bonus for the year the termination occurs, (ii) a pro-rata portion of the NEO's target bonus for the year in which the date of termination occurs,

(iii) except as otherwise provided in the applicable equity award agreement, in the event that stock options and other stock-based awards are assumed, continued or substituted in the change in control, accelerated vesting of (A) 100% of his or her unvested stock options and other unvested stock-based awards subject to time-based vesting, (B) all performance-based awards held by the NEO with performance metrics deemed to be met at the greater of target levels or the actual level of performance on the date of termination and (iv) if the NEO is enrolled in the Company's group health care programs immediately prior to the date of termination and properly elects to receive COBRA benefits, payment of the COBRA premiums by the Company for up to 18 months following termination. Pro-ratio for purposes of item (ii) of the preceding sentence shall be determined based on the number of full months elapsed in the year through the date of termination relative to the total number of full months in the year.

Change in Control

In the event that any then-outstanding stock options and stock-based awards are not assumed, continued or substituted in a change in control, then Mr. Snodgres, Mr. Bylund, Ms. Gebski and Mr. Kuriyel will be entitled to receive accelerated vesting of (i) 100% of his or her unvested stock options and other stock-based awards subject solely to time-based vesting and (ii) all of his or her stock options and other stock-based awards that are subject to performance-based vesting, with performance metrics deemed to be met at the greater of the target level or the actual level of performance on such date of the change in control.

Potential Payments Upon Termination or Change in Control

The 2012 Plan and the 2018 Plan (collectively referred to as "the Plans"), provide that upon the effectiveness of a "sale event," as defined in the Plans, except as otherwise provided by the Compensation Committee in the award agreement, all outstanding awards will automatically terminate, unless the parties to the sale event agree that such awards will be assumed or continued by the successor entity. The Compensation Committee subsequently determined that upon a "sale event," notwithstanding anything to the contrary in the applicable award agreement, the initial equity awards made to Mr. Bylund in connection with his initial hiring will be immediately accelerated and become fully exercisable or nonforfeitable. In addition, in the case of a sale event in which the Company's shareholders receive cash consideration, the Company may make or provide for a cash payment to participants holding options equal to the difference between the per share cash consideration and the exercise price of the options and, under the 2018 Plan, make or provide for a payment, in cash or in kind, to the grantees holding other awards in an amount equal to the per share cash consideration multiplied by the number of vested shares underlying such awards.

Assuming the NEO's employment was terminated by the Company or the NEO resigned for good reason (other than within 24 months following a change in control in which equity awards are assumed, continued or substituted) and such event took place on December 31, 2022, each of the NEOs would have been entitled to the payments and benefits shown in the table below.

Name	Payments and Benefits			Total (\$)
	Base Salary Continuation (\$)	Value of Accelerated Vesting of Equity Awards (\$) ⁽¹⁾	Value of Health Insurance Under COBRA (\$)	
Tony J. Hunt	800,000	6,378,175	17,332	7,195,507
Jon K. Snodgres	463,412	2,594,522	26,631	3,084,565
James R. Bylund	423,607	980,315	17,332	1,421,254
Christine Gebski	359,450	1,242,928	30,079	1,632,457
Ralf Kuriyel	368,227	1,504,856	30,079	1,903,162

(1) Based on the intrinsic value of the stock options and RSUs on December 31, 2022, which is calculated using the \$169.31 market closing price of the Common Stock on December 30, 2022 the last trading day of 2022.

Assuming a change in control occurred on December 31, 2022, each of the NEOs would have been entitled to the payments and benefits shown in the table below.

Name	Payments and Benefits			Total (\$)
	Base Salary Continuation (\$)	Value of Accelerated Vesting of Equity Awards (\$) ⁽¹⁾	Value of Health Insurance Under COBRA (\$)	
Tony J. Hunt	—	35,372,770	—	35,372,770
Jon K. Snodgres	—	—	—	—
James R. Bylund	—	—	—	—
Christine Gebski	—	—	—	—
Ralf Kuriyel	—	—	—	—

(1) Based on the intrinsic value of the one-time special award granted to Mr. Hunt in 2018 on December 31, 2022, which is calculated using the \$169.31 market closing price of the Common Stock on December 30, 2022, the last trading day of 2022.

Assuming the NEO's employment was terminated by the Company or the NEOs resigned for good reason within 24 months following a change in control in which equity awards are assumed, continued or substituted and such event took place on December 31, 2022, each of the NEOs would have been entitled to the payments and benefits shown in the table below.

Name	Payments and Benefits				Total (\$)
	Base Salary and Target Bonus Payment (\$)	Pro-Rata Bonus Payout (\$)	Value of Accelerated Vesting of Equity Awards (\$) ⁽¹⁾	Value of Health Insurance Under COBRA (\$)	
Tony J. Hunt	3,200,000	800,000	7,019,889	25,998	11,045,887
Jon K. Snodgres	1,114,001	279,255	2,624,585	39,946	4,057,787
James R. Bylund	1,017,650	254,826	1,890,764	25,998	3,189,238
Christine Gebski	813,306	182,754	1,787,438	45,118	2,828,616
Ralf Kuriyel	833,055	187,143	1,754,354	45,118	2,819,670

(1) Based on the intrinsic value of the stock options and RSUs on December 31, 2022 based upon market closing price of \$169.31 of the Common Stock on December 30, 2022, the last trading day of 2022.

CEO PAY RATIO

Pursuant to a mandate of the Dodd-Frank Act, the SEC adopted a rule requiring that we annually disclose the ratio of our median employee's total annual compensation to the total annual compensation of our CEO, Tony J. Hunt, who is also our principal executive officer (the "CEO Pay Ratio").

The Company's compensation and benefits philosophy and the overall structure of the compensation and benefit programs are broadly similar across the organization and aim to encourage and reward all employees who contribute to the Company's success. The Company strives to ensure the pay of every employee reflects the level of his or her job impact and responsibilities and is competitive within the Company's peer group. Compensation rates are benchmarked and are generally set to be market-competitive in the country in which the jobs are performed. The Company's ongoing commitment to pay equity is critical to successfully supporting a diverse workforce with opportunities for all employees to grow, develop, and contribute.

We identified the median employee using total compensation as reported on Form W-2, subtracting bonuses earned in 2021 but paid in 2022, adding bonuses earned in 2022 but not paid until March 2023, and adding the fair value of equity awards granted to the employee during 2022. All individuals who were employed by the Company on December 31, 2022, the last day of the Company's fiscal year, were included in the median calculation (including all employees, whether employed on a full-time, part-time, seasonal or temporary basis).

As illustrated in the table below, the Company's 2022 CEO Pay Ratio was approximately 91:1.

Tony J. Hunt (CEO) 2022 Compensation	\$	7,713,930
Median Employee 2022 Compensation	\$	84,363
CEO Pay Ratio		91:1

Compensation for the median employee was determined in the same manner as the total compensation reported for Mr. Hunt in the "Total" column of the Summary Compensation Table. The pay ratio reported above is a reasonable estimate calculated in a manner consistent with SEC rules, based on the Company's internal records and the methodology described above. The SEC rules for identifying the median compensated employee allow companies to adopt a variety of methodologies, to apply certain exclusions and to make reasonable estimates and assumptions that reflect their employee populations and compensation practices. Accordingly, the pay ratio reported by other peer companies may not be comparable to the pay ratio reported above, as other companies have different employee populations and compensation practices and may use different methodologies, exclusions, estimates and assumptions in calculating their own pay ratios.

PAY VERSUS PERFORMANCE

As required by Section 953(a) of the Dodd-Frank Wall Street Reform and Consumer Protection Act and Item 402(v) of Regulation S-K, the Company is providing information about the relationship between executive compensation actually paid to Mr. Hunt, who is the Principal Executive Officer (“PEO”), and the other NEOs (as calculated in accordance with 402(v) of Regulation S-K) and certain financial performance measures. For additional information on the Company’s compensation programs and philosophy and how the Company designs its compensation programs to align pay with performance, see the section titled “*Compensation Discussion and Analysis – Compensation Objectives*” on page 38.

Pay Versus Performance Table

Year	Summary Compensation on Table Total for PEO (\$)	Compensation Actually Paid to PEO (\$) ⁽¹⁾	Average Summary Compensation Table Total for Non-PEO NEOs (\$)	Average Compensation Actually Paid to Non-PEO NEOs (\$) ⁽²⁾	Value of Initial Fixed \$100 Investment Based On:		Net Income (\$) ⁽⁵⁾	Adjusted Revenue (\$) ⁽⁶⁾
					Total Shareholder Return (\$) ⁽³⁾	Peer Group Total Shareholder Return (\$) ⁽⁴⁾		
2022	7,713,930	(14,037,928)	2,030,204 ⁽⁷⁾	373,690 ⁽⁷⁾	183	111	185,958,784	823,421,806
2021	7,765,070	28,761,887	1,903,210 ⁽⁷⁾	3,095,727 ⁽⁷⁾	286	125	128,290,831	666,832,455
2020	5,066,061	36,587,864	1,660,855 ⁽⁸⁾	4,883,849 ⁽⁸⁾	207	126	59,925,688	360,009,590

- (1) The amounts reported represent the “compensation actually paid” to Mr. Hunt, computed in accordance with Item 402(v) of Regulation S-K, but do not reflect the actual amount of compensation earned by or paid to Mr. Hunt in the applicable year. In accordance with Item 402(v) of Regulation S-K, the following adjustments were made to the amount reported for Mr. Hunt in the “Total” column of the Summary Compensation Table for each year to calculate compensation actually paid:

Year	Summary Compensation Table Total for PEO (\$)	Summary Compensation Table Value of Equity Awards (\$) ^(a)	Equity Award Adjustments (\$) ^(b)	Compensation Actually Paid to PEO (\$)
2022	7,713,930	(6,123,490)	(15,628,368)	(14,037,928)
2021	7,765,070	(5,663,515)	26,660,332	28,761,887
2020	5,066,061	(3,957,311)	35,479,114	36,587,864

- (a) The amounts reported represent the sum of the amounts reported in the “Stock Awards” and “Option Awards” columns of the Summary Compensation Table for the applicable year.
- (b) The amounts deducted or added in calculating the equity award adjustments are as follows and the valuation assumptions used to calculate fair values did not materially differ from those disclosed at the time of the grant:

Year	Year End Fair Value of Equity Awards (\$)	Year Over Year Change in Fair Value of Outstanding and Unvested Equity Awards (\$)	Fair Value as of Vesting Date of Equity Awards Granted and Vested in the Year (\$)	Year Over Year Change in Fair Value of Equity Awards Granted in Prior Years that Vested in the Year (\$)	Fair Value at the End of the Prior Year of Equity Awards that Failed to Meet Vesting Conditions in the Year (\$)	Value of Dividends or other Earnings Paid on Stock or Option Awards not Otherwise Reflected in Fair Value or Total Compensation (\$)	Total Equity Award Adjustments (\$)
2022	5,089,051	(16,700,137)	—	(4,017,282)	—	—	(15,628,368)
2021	5,871,874	18,454,854	—	2,333,604	—	—	26,660,332
2020	8,611,644	27,291,322	—	(423,852)	—	—	35,479,114

- (2) The amounts reported represent the average “compensation actually paid” to the NEOs other than Mr. Hunt as a group, computed in accordance with Item 402(v) of Regulation S-K. The amounts do not reflect the actual average amount of compensation earned by or paid to such NEOs as a group in the applicable year. In accordance with Item 402(v) of Regulation S-K, the following adjustments were made to the average of the amounts reported in the “Total” column of the Summary Compensation Table for the NEOs as a group (excluding Mr. Hunt) for each year to determine the compensation actually paid, using the same methodology described above in footnote 1:

Year	Average Reported Summary Compensation Table Total for Non-PEO NEOs (\$)	Average Summary Compensation Table Value of Equity Awards (\$) ^(a)	Average Equity Award Adjustments (\$) ^(b)	Average Compensation Actually Paid to Non-PEO NEOs (\$)
2022	2,030,204	(1,293,539)	(362,975)	373,690
2021	1,903,210	(1,158,499)	2,351,016	3,095,727
2020	1,660,855	(991,336)	4,214,330	4,883,849

(a) The amounts reported represent the average of the sum of the amounts reported in the “Stock Awards” and “Option Awards” columns in the Summary Compensation Table for the applicable fiscal year.

(b) The amounts deducted or added in calculating for equity award adjustments are as follows:

Year	Year End Fair Value of Equity Awards (\$)	Year Over Year Change in Fair Value of Outstanding and Unvested Equity Awards (\$)	Fair Value as of Vesting Date of Equity Awards Granted and Vested in the Year (\$)	Year Over Year Change in Fair Value of Equity Awards Granted in Prior Years that Vested in the Year (\$)	Fair Value at the End of the Prior Year of Equity Awards that Failed to Meet Vesting Conditions in the Year (\$)	Value of Dividends or other Earnings Paid on Stock or Option Awards not Otherwise Reflected in Fair Value or Total Compensation (\$)	Total Equity Award Adjustments (\$)
2022	972,047	(895,955)	—	(426,369)	(12,698)	—	(362,975)
2021	1,240,869	923,948	—	186,199	—	—	2,351,016
2020	2,164,711	1,959,514	—	90,105	—	—	4,214,330

(3) Total shareholder return (“TSR”) is calculated by dividing the sum of the cumulative amount of dividends for the measurement period, assuming dividend reinvestment, and the difference between the Company’s share price at the end and the beginning of the measurement period by the Company’s share price at the beginning of the measurement period.

(4) Represents the weighted peer group TSR. The peer group used for this purpose is the Nasdaq Biotechnology Index, a published industry index.

(5) The dollar amounts reported represent the amount of net income reflected in the Company’s audited financial statements for the applicable fiscal year.

(6) Adjusted revenue is defined as the Company’s total consolidated revenue as reported under U.S. GAAP adjusted to reflect the impact of acquisitions. In 2022, there was a \$21.9 million favorable impact on total as-reported consolidated revenue of \$801.5 million related to the change in foreign exchange rates. In 2021, the total as-reported consolidated revenue of \$670.5 million was adjusted (decreased) by \$3.7 million, resulting in adjusted revenue of \$666.8 million. In 2020, the as-reported consolidated revenue of \$366.3 million was adjusted (decreased) by \$6.3 million, resulting in adjusted revenue of \$360.0 million. While the Company considers numerous financial and non-financial performance measures for the purpose of evaluating and determining executive compensation, the Company considers adjusted revenue, which is one of the Corporate Objectives (along with adjusted EPS) used to determine annual cash incentive compensation paid to the NEOs for fiscal year 2022, to be the most important financial performance measure used to link compensation actually paid to Company performance for fiscal year 2022.

(7) Non-PEO NEOs for 2021 and 2022 include Mr. Snodgres, Mr. Bylund, Ms. Gebski and Mr. Kuriyel.

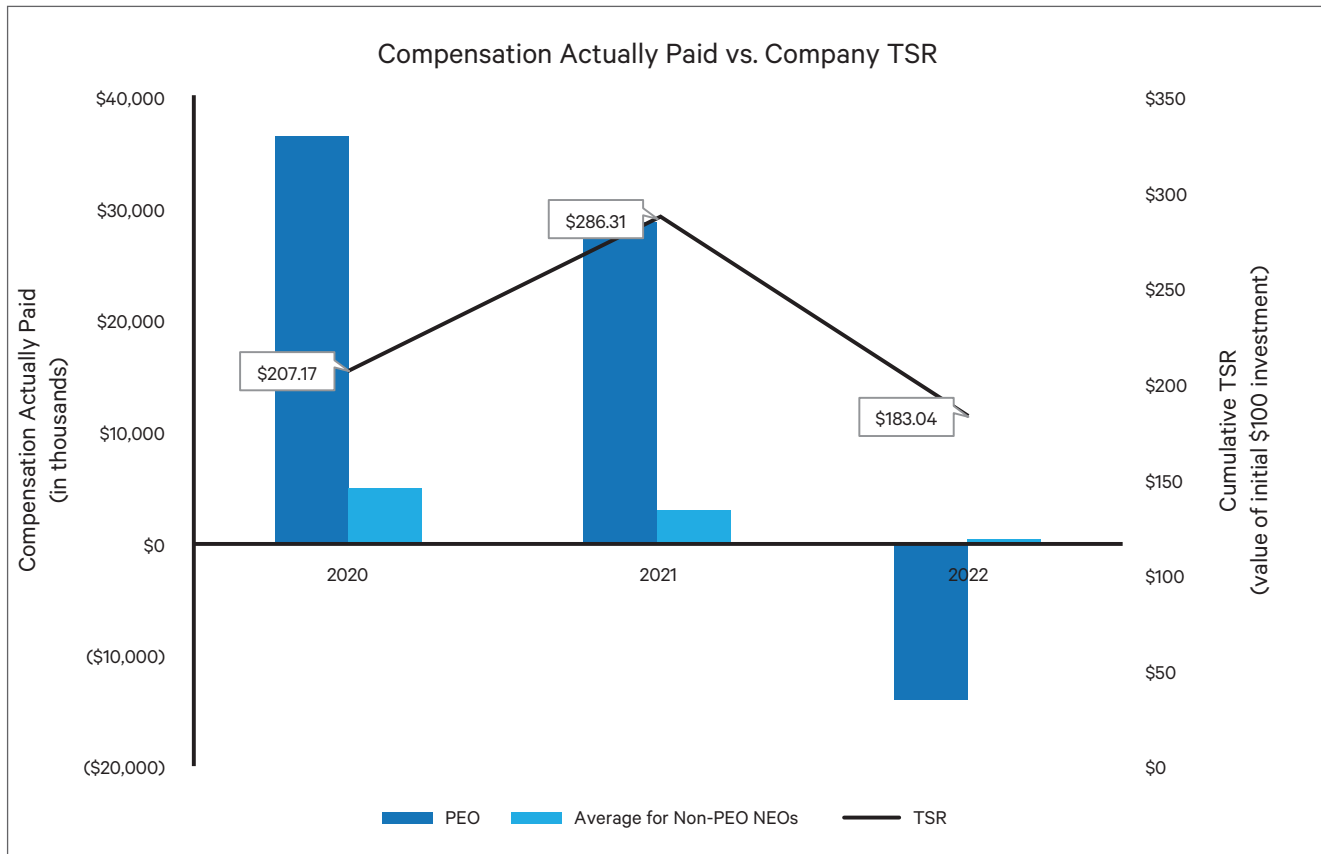
(8) Non-PEO NEOs for 2020 include Mr. Snodgres and Mr. Kuriyel.

Description of Relationship Between Compensation Actually Paid and Selected Performance Metrics

As described above in the section titled “*Compensation and Discussion Analysis – Compensation Objectives*” on page 38, the Company’s compensation program is designed to attract and retain high-performing talent in the bioprocessing industry, motivate the Company’s executive officers to create long-term, enhanced shareholder value, and provide a fair reward for executive effort and stimulate professional and personal growth. The Company uses several performance measures to align executive compensation with Company performance, not all of which are presented in the Pay Versus Performance Table above. Moreover, the Company calculates compensation to the CEO and other NEOs on a basis different than the amount reported in the Summary Compensation Table and compensation actually paid, as calculated in accordance with Item 402(v) of Regulation S-K, is not considered by the Board and the Compensation Committee in evaluating or determining executive compensation. In addition, the Board and the Compensation Committee do not use TSR or net income as performance measures when making pay compensation decisions. In accordance with Item 402(v) of Regulation S-K, the Company is providing the following descriptions of the relationships between compensation actually paid and the financial performance metrics presented in the Pay Versus Performance Table.

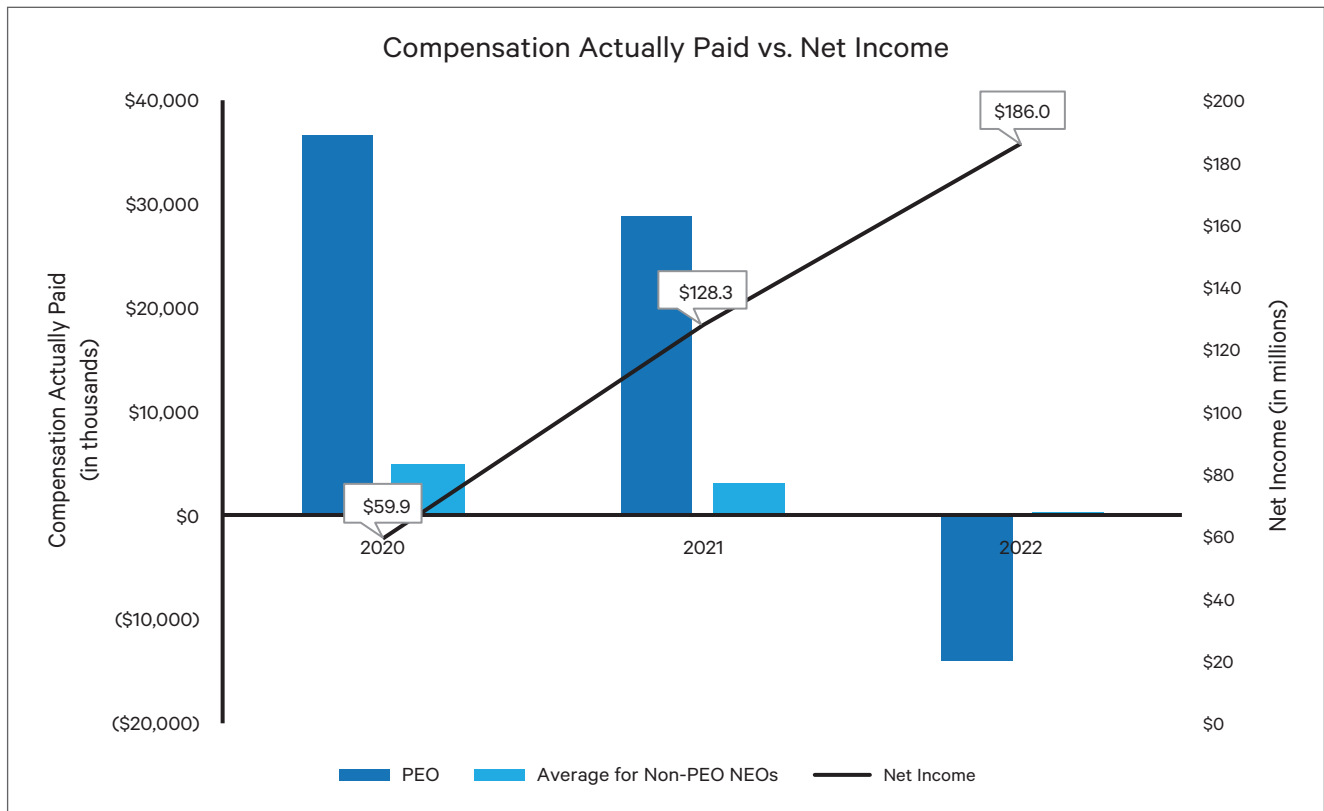
Compensation Actually Paid and Company TSR

The graph below describes the relationship between compensation actually paid to Mr. Hunt and the average compensation actually paid to the Company's other NEOs to the Company's TSR over the three-year period from December 31, 2019 to December 31, 2022, assuming an initial investment of \$100 on December 31, 2019. As the graph shows, this relationship is generally aligned in large part because a significant portion of the compensation actually paid to the Company's NEOs is in the form of equity awards, the value of which is impacted by the stock price changes.



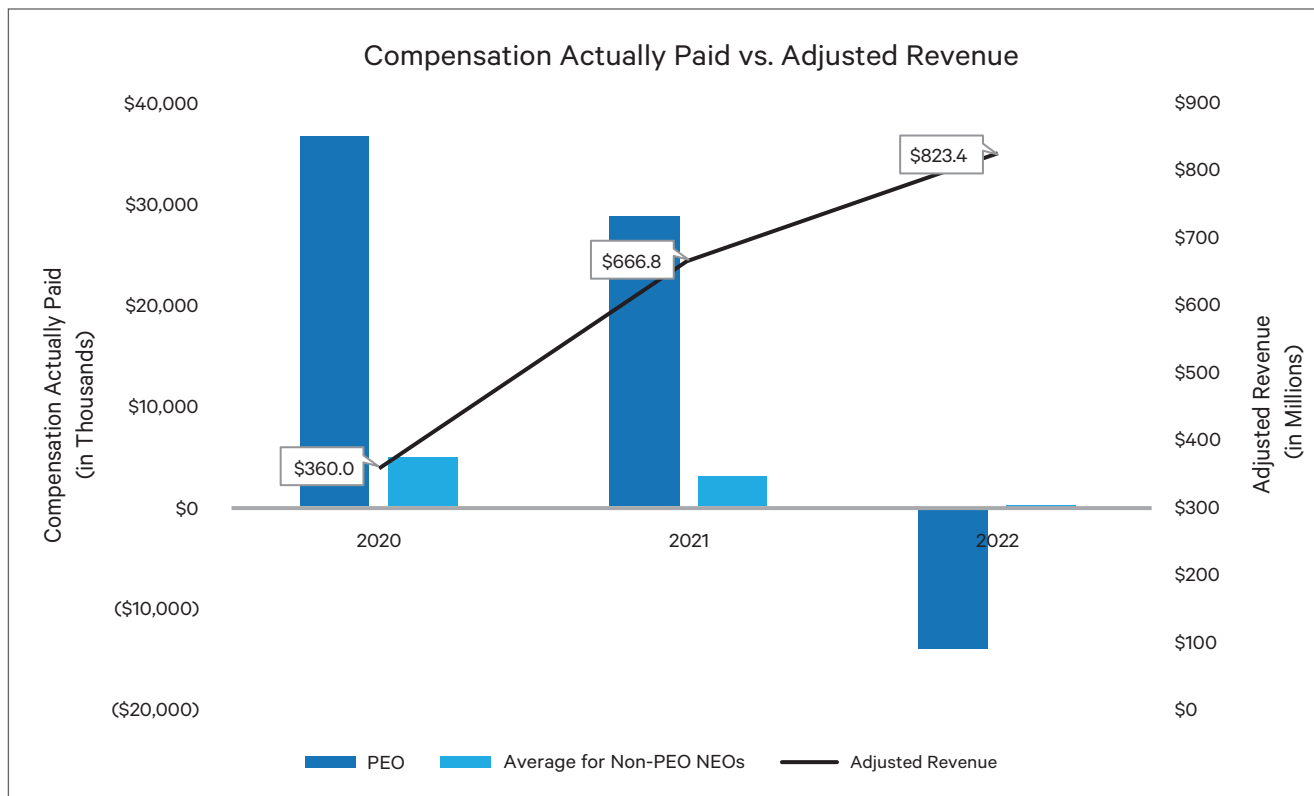
Compensation Actually Paid and Net Income

The graph below shows the relationship between compensation actually paid to Mr. Hunt and the average compensation actually paid to the Company's other NEOs to the Company's net income for the three years presented in the Pay Versus Performance Table. The Company does not use net income as a performance measure in its executive compensation program:



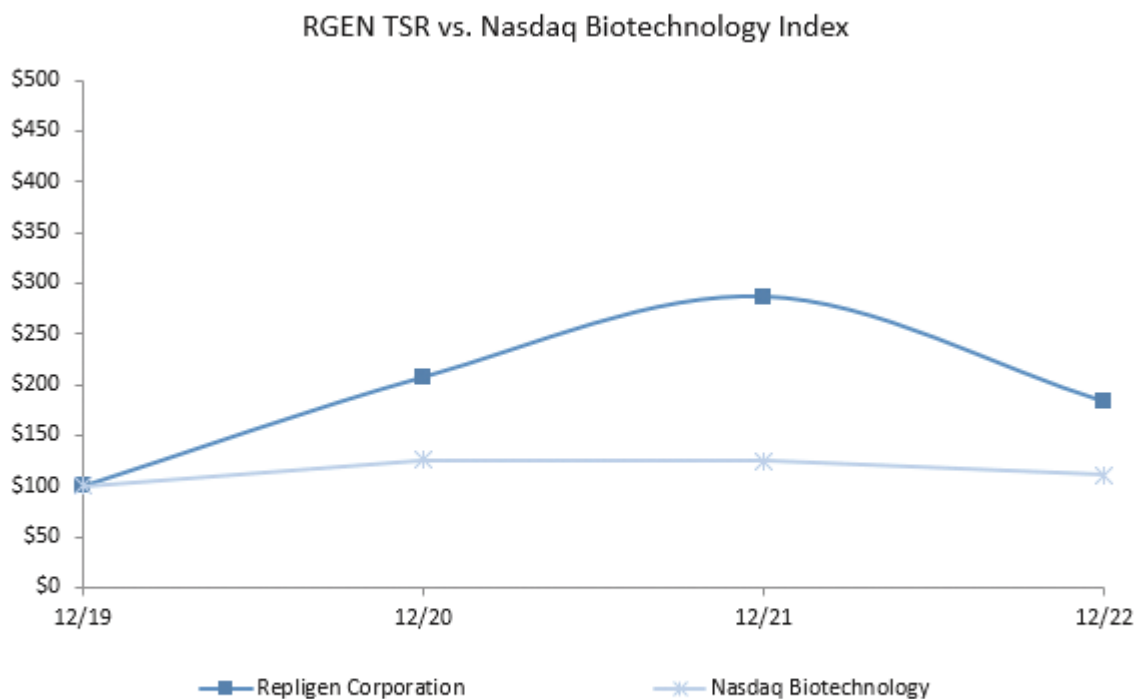
Compensation Actually Paid and Adjusted Revenue

The graph below shows the relationship between compensation actually paid to Mr. Hunt and the average compensation actually paid to the Company’s other NEOs to the Company’s adjusted revenue for the three years presented in the Pay Versus Performance Table. As described above, adjusted revenue is defined as the Company’s total consolidated revenue as reported under U.S. GAAP, adjusted to reflect the impact of acquisitions. While the Company uses numerous financial and non-financial performance measures in its compensation programs, the Company has determined that adjusted revenue is the most important performance measure used to link compensation actually paid to the Company’s NEOs for fiscal year 2022 to Company performance. The Company uses adjusted revenue (along with adjusted EPS, both of which are weighted equally) as one of the Corporate Objectives in the Company’s short-term incentive compensation program:



Total Shareholder Return

The graph below describes the relationship between Repligen Corporation’s (Nasdaq:RGEN) TSR and the TSR for the Nasdaq Biotechnology index:



*\$100 invested on 12/31/19 in stock or index, including reinvestment of dividends. Fiscal year ended December 31.

As mentioned above, the Company does not use TSR as a performance measure to make decisions on executive compensation.

Tabular List of Performance Measures

The following table includes financial performance measures that the Company has determined are its most important financial performance measures for 2022 and how they were used in relation to executive compensation:

Financial Measure	Application in Most Recently Completed Fiscal Year’s Compensation
Adjusted revenue	Annual Cash Incentive Compensation – Corporate Objectives
Adjusted EPS	Annual Cash Incentive Compensation – Corporate Objectives
Adjusted ROIC	Long-term Incentive Plan – PSU Portion (3-year goal)
Base Organic Growth	Long-term Incentive Plan – PSU Portion (3-year goal)

The description of how adjusted revenue and adjusted EPS are calculated can be found in the section titled *“Compensation Discussion and Analysis – Executive Compensation”* beginning on page 42. The definitions for Adjusted ROIC and Base Organic Growth can be found in the section titled *“Proxy Summary – Long-term Equity Incentive Breakout for NEOs”* beginning on page 9.

DIRECTOR COMPENSATION

For the fiscal year ended December 31, 2022, non-employee directors received an annual cash retainer for service on the Board and committees as set forth in the table below.

	Annual Retainer	
Board of Directors		
Each Non-Employee Member of the Board	\$	60,000
Additional Retainer for the Chairperson	\$	95,000
Audit Committee		
Committee Chairperson	\$	30,000
Other Committee Members	\$	10,000
Compensation Committee		
Committee Chairperson	\$	20,000
Other Committee Members	\$	10,000
Nominating and Corporate Governance Committee		
Committee Chairperson	\$	16,000
Other Committee Members	\$	5,000

Under the Company's Amended and Restated Director Compensation Policy, as amended in May 2022, each newly elected, non-employee director who joined the Board received an option to purchase shares of Common Stock with an aggregate value equal to the aggregate value of the stock option and restricted stock unit comprising the then-current annual award granted to the existing Board members. These initial option grants vest in equal annual installments over a three-year period from the date of grant, provided such person is still a director on such vesting date. Also, on the effective date of a new director's initial appointment or election to the Board, such new director shall receive an additional award of (i) a stock option to purchase shares of our Common Stock and (ii) a restricted stock unit award, each of which shall have a value equal to the value of the stock option and restricted stock unit award, respectively, comprising the then-current annual award, pro-rated based on the number of months from such effective date until the Company's next Annual Meeting of Shareholders.

In addition, at each Annual Meeting of Shareholders of the Company, each non-employee director re-elected to the Board by the shareholders is awarded annual equity compensation. In 2022, all non-employee directors, other than the Chairperson, were entitled to annual equity compensation with a grant date fair value of \$170,000, and the Chairperson was entitled to annual equity compensation with a grant date fair value of \$205,000. The annual equity compensation award is 50% in the form of RSUs, and 50% in the form of stock options. Annual equity awards vest in full on the earlier of the first anniversary of the date of the grant or the next Annual Meeting of Shareholders, provided such person is still a director on such vesting date. In the event of a Sale Event (as defined in the 2018 Plan), all equity retainer awards granted to such non-employee directors shall become 100% vested and exercisable or nonforfeitable immediately prior to such Sale Event.

In March 2023, the Board, based upon the recommendation of our independent compensation consultant, further amended its Amended and Restated Director Compensation Policy to increase the annual equity compensation for all directors, excluding the Chairperson, to \$215,000 and to increase the annual equity compensation for the Chairperson to \$250,000.

DIRECTOR COMPENSATION TABLE FOR THE FISCAL YEAR ENDED DECEMBER 31, 2022

The following table sets forth a summary of the compensation the Company paid to its non-employee directors in the year ended December 31, 2022.

Name	Fees Earned or Paid in Cash (\$)	Stock Awards (\$) ⁽¹⁾⁽²⁾⁽³⁾⁽⁴⁾	Option Awards (\$) ⁽¹⁾⁽²⁾⁽³⁾⁽⁴⁾	Total (\$)
Nicolas M. Barthelemy	85,000	84,997	85,000	254,997
Karen A. Dawes	176,989	102,505	102,485	381,979
Carrie Eglinton Manner	70,000	162,990	162,928	395,918
Konstantin Konstantinov	59,934	84,997	255,014	399,945
Rohin Mhatre	70,000	191,322	191,218	452,540
Glenn P. Muir	100,000	84,997	85,000	269,997

- (1) Represents the aggregate grant date fair value of awards granted in 2022 calculated in accordance with the ASC Topic 718. The assumptions the Company used for calculating the grant date fair values are set forth in Note 2, "Summary of Significant Accounting Policies – Stock Based Compensation," to the Company's consolidated financial statements included in the Company's Form 10-K for the fiscal year ended December 31, 2022.

- (2) The non-employee directors of the Board who held such position on December 31, 2022 held the following aggregate number of unexercised stock options and unvested RSUs as of that date:

Name	Number of Securities Underlying Unexercised Options	Number of Unvested Restricted Stock Units
Nicolas M. Barthelemy	2,449	534
Karen A. Dawes	19,819	644
Carrie Eglinton Manner	6,433	1,024
Konstantin Konstantinov	3,796	534
Rohin Mhatre	7,523	1,202
Glenn P. Muir	38,947	534

- (3) The following table presents the grant date fair value of each grant of RSUs or stock options in the fiscal year ended December 31, 2022 to non-employee directors, computed in accordance with the ASC Topic 718:

Name	Grant Date	Number of Restricted Stock Units (#)	Number of Securities Underlying Options (#)	Exercise Base Price of Option Awards (\$)	Grant Date Fair Value of Stock and Option Awards (\$)
Nicolas M. Barthelemy	5/26/2022	—	1,298	159.17	85,000
	5/26/2022	534	—	—	84,997
Karen A. Dawes	5/26/2022	—	1,565	159.17	102,485
	5/26/2022	644	—	—	102,505
Carrie Eglinton Manner	5/26/2022	—	2,488	159.17	162,928
	5/26/2022	1,024	—	—	162,990
Konstantin Konstantinov	5/26/2022	—	1,298	159.17	85,000
	5/26/2022	—	2,498	159.17	170,014
	5/26/2022	534	—	—	84,997
Rohin Mhatre	5/26/2022	—	2,920	159.17	191,218
	5/26/2022	1,202	—	—	191,322
Glenn P. Muir	5/26/2022	—	1,298	159.17	85,000
	5/26/2022	534	—	—	84,997

- (4) In 2022, the Board agreed to treat Ms. Eglinton Manner and Dr. Mhatre, who joined the Board in 2020, consistently with the Company's Amended and Restated Director Compensation Policy, as amended in May 2022, and therefore granted an equity award in the form of RSUs and stock options in the amount equal to the difference between what Ms. Eglinton Manner and Dr. Mhatre were granted when they joined the Board and what is now granted under the new policy to new Board members. See "Director Compensation" on page 62 for more information on the Company's Amended and Restated Director Compensation Policy.

COMPENSATION COMMITTEE INTERLOCKS AND INSIDER PARTICIPATION

Mr. Barthelemy, Mr. Muir and Dr. Mhatre were the members of the Compensation Committee during the year ended December 31, 2022. No member of the Compensation Committee is a current or former employee of the Company or had any relationship with the Company requiring disclosure herein. No interlocking relationship exists between any member of the Board or the Compensation Committee and any member of the board or compensation committee of any other company, and no such interlocking relationship has existed in the past.

GENERAL ANNUAL MEETING INFORMATION

This Proxy Statement is furnished in connection with the solicitation of proxies by the Board of Directors (“Board”) of Repligen Corporation (“Repligen”, or the “Company”), for use at the 2023 Annual Meeting of Shareholders (the “Annual Meeting”), to be held on Thursday, May 18, 2023 at 8:00 a.m. EDT, at www.virtualshareholdermeeting.com/RGEN2023, and at any adjournment or postponement thereof. The Annual Meeting will be held virtually.

Repligen’s Annual Report to Shareholders, containing financial statements for the fiscal year ended December 31, 2022 (the “Annual Report”), is being provided together with this Proxy Statement to all shareholders entitled to vote at the Annual Meeting. It is anticipated that this Proxy Statement and the accompanying proxy card will be first sent or given to shareholders on or about April 11, 2023.

Record Date:	March 20, 2023 (the “Record Date”). Only shareholders of record as of the Record Date, are entitled to notice of and to vote at the Annual Meeting and any adjournments or postponements thereof.
Quorum:	The representation, in person or by proxy, of at least a majority of the outstanding shares of Repligen Common Stock entitled to vote at the Annual Meeting is necessary to constitute a quorum for the transaction of business. Shares present virtually during the Annual Meeting will be considered shares of Common Stock represented in person at the meeting.
Voting Securities/Common Stock Outstanding:	As of the Record Date, the Company had 55,644,246 shares of Common Stock outstanding and entitled to vote. Each outstanding share of Common Stock entitles the record holder to one vote.
Voting Methods:	<p>Shareholders may vote online during the Annual Meeting or in advance of the Annual Meeting by proxy by completing, signing, dating and returning the accompanying proxy card or by voting by telephone or via the Internet in accordance with the instructions listed on the proxy card. Execution of a proxy card, or voting by telephone or via the Internet prior to the Annual Meeting, will not in any way limit a shareholder’s right to attend the Annual Meeting and vote during the meeting.</p> <p>If you complete and submit your proxy voting instructions, the persons named as proxies will follow your instructions. Any shareholder submitting a proxy has the right to abstain from voting for any individual nominee to the Board by writing that nominee’s number on the space provided on the proxy card, checking the box next to the name of such individual nominee if voting by proxy via the Internet or, if using the telephone to vote by proxy, by following the verbal instructions for entering the two-digit number appearing on the proxy card immediately before the name of such individual nominee. Where a choice has been specified on the proxy with respect to a matter, the shares represented by the proxy will be voted in accordance with such specifications. If a validly executed proxy card is returned without indicating how the shares should be voted on a matter, such proxies will be voted FOR election of the director nominees; FOR ratification of the appointment of the independent registered public accountants; FOR the approval, on a non-binding advisory basis, of the compensation of our NEOs; and for every 1 YEAR, on a non-binding, advisory basis, on the frequency of future non-binding, advisory votes to approve the compensation of our NEOs.</p> <p>Other than (i) the election of directors, (ii) the ratification of Ernst & Young LLP, (iii) the advisory vote to approve the compensation of our NEOs, (iv) the non-binding, advisory vote on the frequency of future non-binding, advisory votes to approve the compensation of our NEOs, (v) the amendment to our Certificate of Incorporation, and (vi) the ratification of our amended and restated By-laws, the Board knows of no other matters to be presented at the Annual Meeting. If any other matter should be properly presented at the Annual Meeting upon which a vote may be taken, shares represented by all proxies received by the Board will be voted with respect thereto in accordance with the judgment of the persons named as attorneys-in-fact in the proxies.</p>
Revoking Your Proxy:	Any proxy given pursuant to this solicitation may be revoked by the person giving it at any time before the taking of the vote at the Annual Meeting. Proxies may be revoked by: (1) giving written notice of revocation to the Corporate Secretary of Repligen at any time before the taking of the vote at the Annual Meeting; (2) duly executing a later-dated proxy card relating to the same shares and delivering it to the Corporate Secretary of Repligen or by telephone or the Internet, in accordance with the instructions listed on the proxy card; or (3) attending and voting at the Annual Meeting (although attendance at the Annual Meeting will not in and of itself constitute a revocation of a proxy). For those shareholders who submit a proxy by telephone or the Internet, the date on which the proxy is submitted in accordance with the instructions listed on the proxy card is deemed to be the date of the proxy. Any written notice of revocation or subsequent proxy should be sent so as to be delivered to the mailing address of our principal executive offices at Repligen Corporation, Attention: Corporate Secretary, 41 Seyon Street, Building #1, Suite 100, Waltham, Massachusetts 02453, at or before the taking of the vote at the Annual Meeting.

<p>Effect of Abstentions and Broker Non-Votes:</p>	<p>Shares represented by proxies that contain one or more abstentions or broker “non-votes,” are counted as present or represented for purposes of determining the presence or absence of a quorum for the Annual Meeting. A broker “non-vote” occurs when a broker or other nominee holding shares for a beneficial owner votes on one proposal, but does not vote on another proposal because, with respect to such other proposal, the broker does not have discretionary voting power and has not received instructions from the beneficial owner. Broker “non-votes” are not considered voted for the particular matter. If a shareholder holds shares in “street-name” through a broker or other nominee, absent voting instructions from the shareholder, such shares will not be counted as voting and will have no effect on those proposals, other than Proposal 2, requiring approval by a majority of the votes cast, and will have the same effect as if you voted against Proposals 5 and 6. Proposal 2 to ratify the appointment of the Company’s independent registered public accounting firm is a “routine” matter for which a broker does not need voting instruction in order to vote a shareholder’s shares.</p>
<p>Votes Required for Adoption of Proposals:</p>	<p><i>Election of Directors.</i> In accordance with our By-laws, directors are elected by a majority of the votes cast, in person or by proxy, at the Annual Meeting (meaning the number of shares voted “for” a nominee must exceed the number of shares voted against such nominee). Abstentions and broker non-votes will not be counted as votes cast with respect to the election of directors, and, therefore, will not have an effect on the election of director nominees.</p> <p><i>Ratification of Independent Accountants.</i> For the ratification of the appointment of Ernst & Young LLP as the Company’s independent registered public accounting firm for the fiscal year ending December 31, 2023, an affirmative vote of a majority of the shares present or represented by proxy and entitled to vote on such matter is required for approval (meaning that, of the shares represented at the meeting and entitled to vote, a majority of those shares must be voted “for” the proposal for it to be approved). Abstentions shall be included in determining the number of shares present and entitled to vote on the proposal, thus having the effect of a vote against the proposal. Broker “non-votes”, if any, are not counted in determining the number of shares present and entitled to vote and will therefore have no effect on the outcome.</p> <p><i>Advisory Vote to Approve the Compensation of our NEOs.</i> For the advisory vote to approve the compensation of our NEOs, the affirmative vote of the majority of shares present, in person or represented by proxy, and entitled to vote on that matter is required for approval. Abstentions shall be included in determining the number of shares present and entitled to vote on the proposal, thus having the effect of a vote against the proposal. Broker “non-votes”, if any, are not counted in determining the number of shares present and entitled to vote and will therefore have no effect on the outcome.</p> <p><i>Advisory Vote on the Frequency of Future Advisory Votes on the Compensation of our NEOs.</i> For the advisory vote on the frequency of future non-binding, advisory votes on the compensation of our NEOs shareholders may vote “1 Year”, “2 Years”, “3 Years”, or abstain from voting on this proposal. Assuming a quorum is present, the option that receives the most votes shall be the option selected by the shareholders. Abstentions and broker “non-votes” are not counted for the non-binding, advisory vote on frequency of future non-binding, advisory votes to approve the compensation of the NEOs and, therefore, will have no effect on the outcome of the proposal.</p> <p><i>Vote to Approve an Amendment to the Certificate of Incorporation to Permit the Board of Directors to Adopt, Amend or Repeal the By-laws.</i> For the approval of an amendment to our Certificate of Incorporation, the affirmative vote of the majority of the outstanding shares entitled to vote on such matter is required for approval. Abstentions and broker “non-votes” will have the same effect as if you voted against such proposal.</p> <p><i>Ratification of Third Amended and Restated By-laws of the Company.</i> For the approval of the ratification of the amendment and restatement of the By-laws, adopted by the Board on January 27, 2021 to implement stockholder proxy access, the affirmative vote of the majority of the outstanding shares entitled to vote on such matter is required for approval. Abstentions and broker “non-votes” will have the same effect as if you voted against such proposal.</p> <p><i>Other Matters.</i> The Board knows of no other matters to be presented at the Annual Meeting. If any other matter should be properly presented at the Annual Meeting upon which a vote may be taken, the persons named on the enclosed proxy card will have discretionary authority to vote the shares represented by such proxies in accordance with their best judgment.</p>

Cost of Proxy Solicitation:	The cost of solicitation will be borne by Repligen and, in addition to directly soliciting shareholders by mail, Repligen may request banks and brokers to solicit their customers who have stock of Repligen registered in the name of the nominee and, if so, will reimburse such banks and brokers for their reasonable out-of-pocket costs. Solicitation by officers and employees of Repligen may also be made of some shareholders in person or by mail or telephone following the original solicitation. Repligen has retained Okapi Partners LLC to aid in soliciting proxies and advise on certain matters relating to the Annual Meeting for a fee estimated to not exceed \$30,000.
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Important Notice Regarding the Availability of Proxy Materials for the Annual Meeting to be Held on May 18, 2023: The Company's Annual Report and this Proxy Statement will be available at www.proxyvote.com.

ADDITIONAL INFORMATION

SUBMITTING SHAREHOLDER PROPOSALS

Repligen must receive any proposal by a shareholder of Repligen, and (subject to shareholder approval of Proposal 6 of this proxy statement) who meets the proxy access eligibility requirements under our by-laws, for inclusion in the proxy statement furnished to all shareholders entitled to vote at our 2024 Annual Meeting of Shareholders (“2024 Annual Meeting”) at our principal executive office not later than December 13, 2023 in accordance with Rule 14a-8 issued under the Securities Exchange Act of 1934, as amended (“Exchange Act”).

If a shareholder wishes to propose a nomination of persons for election to our Board of Directors (“Board”) or present a proposal at an annual meeting but does not wish to have the proposal considered for inclusion in our proxy statement and proxy card, our amended and restated By-laws establish an advance notice procedure for such nominations and proposals. Shareholders at an annual meeting may only consider proposals or nominations specified in the notice of meeting or brought before the meeting by or at the direction of the Board or by a shareholder of record on the record date for the meeting, who is entitled to vote at the meeting and who has delivered timely notice in proper form to our Corporate Secretary of the shareholder’s intention to bring such business before the meeting.

The required notice must be in writing and received by our Corporate Secretary at our principal executive offices not earlier than 90 days nor later than 60 days prior to the first anniversary of the preceding year’s Annual Meeting of Shareholders. However, in the event that the date of the Annual Meeting of Shareholders is advanced by more than 30 days or delayed by more than 60 days, from the first anniversary of the preceding year’s Annual Meeting of Shareholders, a shareholder’s notice must be so received no later than the close of business of the 90th day prior to such Annual Meeting of Shareholders or of the tenth day following the day on which notice of the date of such Annual Meeting of Shareholders was first made, whichever occurs later. For shareholder proposals to be brought before the 2024 Annual Meeting, the required notice must be received by our Corporate Secretary at our principal executive offices no earlier than February 18, 2024 and no later than March 19, 2024. Shareholder proposals and the required notice should be delivered to Repligen Corporation, Attention: Corporate Secretary, 41 Seyon Street, Building #1, Suite 100, Waltham, Massachusetts 02453.

Subject to the Securities and Exchange Commission’s (“SEC’s”) proxy rules, if a shareholder who wishes to present a proposal at the 2024 Annual Meeting (which is not otherwise submitted for inclusion in the proxy statement in accordance with the preceding paragraph) fails to notify the Company by March 19, 2024 and such proposal is brought before the 2024 Annual Meeting, then under the SEC’s proxy rules, if the proxy statement or form of proxy for the 2024 Annual Meeting so provides, the proxies solicited by Repligen with respect to this year’s 2023 Annual Meeting of Shareholders (the “Annual Meeting”) will confer discretionary voting authority with respect to the shareholder’s proposal on the persons selected by Repligen to vote the proxies solicited by Repligen. If a shareholder makes a timely notification, the proxies may still exercise discretionary voting authority under circumstances consistent with the SEC’s proxy rules.

Any proposal intended to be presented at the 2024 Annual Meeting must also comply with the other requirements of the proxy solicitation rules of the SEC. In order to curtail any controversy as to the date on which a proposal was received by Repligen, it is suggested that proponents submit their proposal by Certified Mail with a Return Receipt requested or other means, including electronic means that permit them to prove date of delivery.

OTHER BUSINESS

Management does not know of any other matters to be brought before the Annual Meeting except those set forth in the notice thereof. If other business is properly presented for consideration at the Annual Meeting, the persons named on the enclosed proxy will have discretionary authority to vote the shares represented by such proxies in accordance with their best judgment.

VOTING PROXIES

The Board recommends an affirmative vote on all proposals specified. Proxies will be voted as specified. If authorized proxies are submitted without specifying an affirmative or negative vote on any proposal, the shares represented by such proxies will be voted in favor of the Board’s recommendations.

HOUSEHOLDING

Our Annual Report, including audited financial statements for the fiscal year ended December 31, 2022, is being mailed to you along with this Proxy Statement. In order to reduce printing and postage costs, Broadridge Financial Solutions, Inc., (“Broadridge”) and in accordance with SEC rules that permit “householding” of proxy materials, has undertaken an effort to deliver only one Annual Report and one Proxy Statement to multiple shareholders sharing an address. This delivery method, called “householding,” is not being used if Broadridge has received contrary instructions from one or more of the shareholders sharing an address. If your household has received only one Annual Report and one Proxy Statement, Repligen Corporation will deliver promptly a separate copy of the Annual Report and the Proxy Statement to any shareholder who sends a written request to Repligen Corporation, Attention: Corporate Secretary, 41 Seyon Street, Building #1, Suite 100, Waltham, MA 02453. If your household is receiving multiple copies of Repligen’s annual reports or proxy statements and you wish to request delivery of only a single copy, you may send a written request to Repligen Corporation, Attention: Corporate Secretary, 41 Seyon Street, Building #1, Suite 100, Waltham, MA 02453.

APPENDIX A
CERTIFICATE OF AMENDMENT
OF
CERTIFICATE OF INCORPORATION
OF
REPLIGEN CORPORATION

Pursuant to Section 242
of the General Corporation Law of the State of Delaware

Repligen Corporation, a corporation duly organized and existing under the General Corporation Law of the State of Delaware (the "Corporation"), does hereby certify that:

1. The Certificate of Incorporation of the Corporation, as amended, is hereby further amended by adding a new Article ELEVENTH to read in its entirety as follows:

"ELEVENTH. To the fullest extent permitted by law, the Board of Directors shall have the power to alter, amend or repeal the By-laws of the Corporation and to make new by-laws."

2. The foregoing amendment was duly adopted in accordance with the provisions of Section 242 of the General Corporation Law of the State of Delaware.

[Signature Page Follows]

APPENDIX B

SECOND-~~THIRD~~ AMENDED AND RESTATED BY-LAWS OF

REPLIGEN CORPORATION

ARTICLE I STOCKHOLDERS

SECTION 1. Place of Meetings. All meetings of stockholders shall be held at such place within or without the State of Delaware as may be designated from time to time by the Board of Directors or, if not so designated, at the principal office of ~~the corporation~~ **Repligen Corporation (the "Corporation")**.

SECTION 2. Annual Meeting. The annual meeting of stockholders of the election of directors and the transaction of such other business as may properly come before the meeting shall be held at 10 a.m. on the last Thursday in July of each year or on such other date or at such hour as may be specified by resolution of the Board of Directors. If the date of the annual meeting shall fall upon a legal holiday at the place of the meeting, the meeting shall be held at the same hour on the next succeeding business day. If the annual meeting is not held on the date designated therefor, the directors shall cause the meeting to be held as soon thereafter as convenient.

SECTION 3. Special Meetings. Special meetings of the stockholders may be called at any time by the President, the Chairman or the Board of Directors; and shall be called by the Secretary or any officer upon the written request of one or more stockholders holding, in the aggregate, at least 30% of the outstanding shares of stock of the ~~corporation~~ **Corporation** entitled to vote at such meeting. Such written request shall state the purpose or purposes of the proposed meeting. Business transacted at any special meeting of stockholders shall be limited to matters relating to the purpose or purposes stated in the notice of meeting.

SECTION 4. Notice of Meetings. Except where some other notice is required by law, written notice of each meeting of stockholders, stating the place, date and hour thereof and the purposes for which the meeting is called, shall be given by or under the direction of the Secretary, not less than ten nor more than sixty days before the date fixed for such meeting, to each stockholder entitled to vote at such meeting of record at the close of business on the day fixed by the Board of Directors as a record date for the determination of the stockholders entitled to vote at such meeting or, if not such date has been fixed, of record at the close of business on the day before the day on which notice is given. Notice shall be given personally to each stockholder or left at his or her residence or usual place of business or mailed postage prepaid and addressed to the stockholder at his or her address as it appears upon the records of the ~~corporation~~ **Corporation**. Without limiting the manner by which notice may otherwise be given to stockholders, any notice to stockholders may be given by electronic transmission in the manner provided in Section 232 of the Delaware General Corporation Law (the "DGCL"). In case of the death, absence, incapacity or refusal of the Secretary, such notice may be given by a person designated either by a Secretary or by the person or persons calling the meeting or by the Board of Directors. A waiver of such notice in writing, signed by the person or persons entitled to said notice, whether before or after the time stated therein, shall be deemed equivalent to such notice. Attendance of a person at a meeting of stockholders shall constitute a waiver of notice of such meeting, except when the stockholder attends a meeting for the express purpose of objecting, at the beginning of the meeting, to the transaction of any business because the meeting is not lawfully called or convened. Neither the business to be transacted at, nor the purpose of, any regular or special meeting of the stockholders need be specified in any written waiver of notice. Notice of any meeting of the stockholders shall be deemed to have been given to any person who may become a stockholder of record after the mailing of such notice and prior to such meeting. Except as required by statute, notice of any adjourned meeting of the stockholders shall not be required.

SECTION 5. Voting List. The officer who has charge of the stock ledger of the ~~corporation~~ **Corporation** shall prepare and make, at least ten days before every meeting of stockholders, a complete list of the stockholders, arranged in alphabetical order, and showing the address of each stockholder and the number of shares registered in the name of each stockholder. Such list shall be open to the examination of any stockholder, for any purpose germane to the meeting, during ordinary business hours, for a period of at least ten days prior to the meeting, either at a place within the city or other municipality or community where the meeting is to be held, which place shall be specified in the notice of the meeting, or if not so specified, at the place where the meeting is to be held. The list shall also be produced and kept at the time and place of the meeting during the whole time thereof, and may be inspected by ~~an~~ **any** stockholder who is present. The stock ledger shall be the only evidence as to who are the stockholders entitled to examine the stock ledger, the list required by this section or the books of the ~~corporation~~ **Corporation**, or to vote at any meeting of stockholders.

SECTION 6. Quorum of Stockholders. At any meeting of the stockholders, the holders of a majority in interest of all stock issued and outstanding and entitled to vote upon a question to be considered at the meeting, present in person or represented by proxy, shall constitute a quorum for the consideration of such question, but a smaller group may adjourn any meeting from time to time. When a quorum is present at any meeting, a majority of the stock represented and entitled to vote at such meeting shall, except where a larger vote is required by law, by the certificate of incorporation, or by these by-laws, decide any question brought before such meeting. A nominee for director shall be elected to the Board of Directors if the number of votes cast for such nominee's election exceed the number of votes cast against such nominee's election; provided, however, that in a contested election a nominee shall be elected by a

plurality of the vote cast by the stockholders entitled to vote on such election of directors. An election shall be considered contested if, as of the last date on which nominees for director may be submitted in accordance with these by-laws, the nominees for election to the Board of Directors exceeds the number of positions on the Board of Directors to be filled by election at that meeting. If an incumbent director is not re-elected, the director shall tender his or her resignation to the Board of Directors. The Nominating and Corporate Governance Committee of the Board of Directors (or any future committee the equivalent thereof) will make a recommendation to the Board of Directors on whether to accept or reject the resignation, or whether other action should be taken. The Board of Directors will act on the recommendation of such committee and will publicly disclose its decision within ninety (90) days from the date of the certification of the election results. An incumbent director who tenders his or her resignation may not participate in such decisions of the committee or the Board of Directors.

SECTION 7. Proxies and Voting. Each stockholder shall at every meeting of the stockholders be entitled to one vote in person or by proxy for each share of the capital stock held of record by such stockholder, but no proxy shall be voted on after three years from its date, unless said proxy provides for a longer period. Persons holding stock in a fiduciary capacity shall be entitled to vote the shares so held, and persons whose stock is pledged shall be entitled to vote, unless in the transfer by the pledgor on the books of the ~~corporation~~ **Corporation** the pledgee shall have been expressly empowered to vote thereon, in which case only the pledgee or the pledgee's proxy may represent said stock and vote thereon. Shares of the capital stock of the ~~corporation~~ **Corporation** belonging to the ~~corporation~~ **Corporation** or to another corporation, a majority of whose shares entitled to vote in the election of directors is owned by the ~~corporation~~ **Corporation**, shall not be entitled to vote nor counted for quorum purposes.

SECTION 8. Conduct of Meeting. Meetings of the stockholders shall be presided over by one of the following officers in the order of seniority and in present and acting: the Chairman of the Board, if any, the Vice-Chairman of the Board, if any, the President, a Vice-President, or, if none of the foregoing is in office and present and acting, a chairman to be chosen by the stockholders. The Secretary of the ~~corporation~~ **Corporation**, if present, or an Assistant Secretary, shall act as secretary of every meeting, but if neither the Secretary nor an Assistant Secretary is present the chairman of the meeting shall appoint a secretary of the meeting.

SECTION 9. Action Without Meeting. Any action required or permitted to be taken at any annual or special meeting of stockholders of the ~~corporation~~ **Corporation** may be taken without a meeting, without prior notice and without a vote, if a consent in writing, setting forth the action so taken, is signed by the holders or by proxy for the holders of outstanding stock having not less than the minimum number of votes that would be necessary to authorize or take such action at a meeting at which all shares entitled to vote on such action were present and voted. Prompt notice of the taking of corporate action without a meeting by less than unanimous written consent shall be given to those stockholders who have not consented in writing.

SECTION 10. Notice of Stockholder Business and Nominations Outside of Proxy Access.

(a) Annual Meetings of Stockholders.

(1) Nominations of persons for election to the Board of Directors and the proposal of other business to be considered by the stockholders may be brought before an annual meeting (i) by or at the direction of the Board of Directors or (ii) by any stockholder of the Corporation who **(A)** was a stockholder of record at the time of giving of notice provided for in **Section 10 or Section 11 of this by-law** **Article I**, who **(B)** is entitled to vote at the meeting, who **(C)** is present (in person or by proxy) at the meeting, and who **(D)** complies with the notice procedures set forth in **Section 10 or Section 11 of this by-law** **Article I** as to such nomination or business. For the avoidance of doubt, the foregoing clause (ii) shall be the exclusive means for a stockholder to bring nominations or business properly before an annual meeting (other than matters properly brought under Rule 14a-8 (or any successor rule) under the Securities Exchange Act of 1934, as amended (the "Exchange Act")), and such stockholder must comply with the notice and other procedures set forth in Article I, Section 10(a)(2) and (3) **or Article I, Section 11** of this by-law to bring such nominations or business properly before an annual meeting. In addition to the other requirements set forth in this by-law, for any proposal of business to be considered at an annual meeting, it must be a proper subject for action by stockholders of the Corporation under Delaware law.

(2) For nominations **(other than nominations pursuant to Article I, Section 11)** or other business to be properly brought before an annual meeting by a stockholder pursuant to clause (ii) of Article I, Section 10(a)(1) of this by-law, the stockholder must (i) have given Timely Notice (as defined below) thereof in writing to the Secretary of the Corporation, and (ii) together with the beneficial owner(s), if any, on whose behalf the nomination or business proposal is made, have acted in accordance with the representations set forth in the Solicitation Statement (as defined below) required by this by-law. To be timely, a stockholder's written notice shall be received by the Secretary at the principal executive offices of the Corporation not later than the close of business on the sixtieth (60th) day nor earlier than the close of business on the ninetieth (90th) day prior to the one-year anniversary of the preceding year's annual meeting; provided, however, that in the event the annual meeting is first convened more than thirty (30) days before or more than sixty (60) days after such anniversary date, or if no annual meeting were held in the preceding year, notice by the stockholder to be timely must be received by the Secretary of the Corporation not later than the close of business on the later of the ninetieth (90th) day prior to the scheduled date of such annual meeting or the tenth (10th) day following the day on which public announcement of the date of such meeting is first made (such notice within such time periods shall be referred to as "Timely Notice"). Such stockholder's Timely Notice shall set forth:

(A) as to each person whom the stockholder proposes to nominate for election or reelection as a director, all information relating to such person that is required to be disclosed in solicitations of proxies for election of directors in an

election contest, or is otherwise required, in each case pursuant to Regulation 14A under the Exchange Act (including such person's written consent to being named in the proxy statement as a nominee and to serving as a director if elected);

(B) as to any other business that the stockholder proposes to bring before the meeting, a brief description of the business desired to be brought before the meeting, the reasons for conducting such business at the meeting, and any material interest in such business of each Proposing Person (as defined below);

(C)(i) the name and address of the stockholder giving the notice, as they appear on the Corporation's books, and the names and addresses of the other Proposing Persons (if any) and (ii) as to each Proposing Person, the following information: (a) the class or series and number of all shares of capital stock of the Corporation which are, directly or indirectly, owned beneficially or of record by such Proposing Person or any of its affiliates or associates (as such terms are defined in Rule 12b-2 promulgated under the Exchange Act), including any shares of any class or series of capital stock of the Corporation as to which such Proposing Person or any of its affiliates or associates has a right to acquire beneficial ownership at any time in the future, (b) all Synthetic Equity Interests (as defined below) in which such Proposing Person or any of its affiliates or associates, directly or indirectly, holds an interest including a description of the material terms of each such Synthetic Equity Interest, including without limitation, identification of the counterparty to each such Synthetic Equity Interest and disclosure, for each such Synthetic Equity Interest, as to (x) whether or not such Synthetic Equity Interest conveys any voting rights, directly or indirectly, in such shares to such Proposing Person, (y) whether or not such Synthetic Equity Interest is required to be, or is capable of being, settled through delivery of such shares and (z) whether or not such Proposing Person and/or, to the extent known, the counterparty to such Synthetic Equity Interest has entered into other transactions that hedge or mitigate the economic effect of such Synthetic Equity Interest, (c) any proxy (other than a revocable proxy given in response to a public proxy solicitation made pursuant to, and in accordance with, the Exchange Act), agreement, arrangement, understanding or relationship pursuant to which such Proposing Person has or shares a right to, directly or indirectly, vote any shares of any class or series of capital stock of the Corporation, (d) any rights to dividends or other distributions on the shares of any class or series of capital stock of the Corporation, directly or indirectly, owned beneficially by such Proposing Person that are separated or separable from the underlying shares of the Corporation, and (e) any performance-related fees (other than an asset based fee) that such Proposing Person, directly or indirectly, is entitled to based on any increase or decrease in the value of shares of any class or series of capital stock of the Corporation or any Synthetic Equity Interests (the disclosures to be made pursuant to the foregoing clauses (a) through (e) are referred to, collectively, as "Material Ownership Interests") and (iii) a description of the material terms of all agreements, arrangements or understandings (whether or not in writing) entered into by any Proposing Person or any of its affiliates or associates with any other person for the purpose of acquiring, holding, disposing or voting of any shares of any class or series of capital stock of the Corporation;

(D)(i) a description of all agreements, arrangements or understandings by and among any of the Proposing Persons, or by and among any Proposing Persons and any other person (including with any proposed nominee(s)), pertaining to the nomination(s) or other business proposed to be brought before the meeting of stockholders (which description shall identify the name of each other person who is party to such an agreement, arrangement or understanding), and (ii) identification of the names and addresses of other stockholders (including beneficial owners) known by any of the Proposing Persons to support such nominations or other business proposal(s), and to the extent known the class and number of all shares of the Corporation's capital stock owned beneficially or of record by such other stockholder(s) or other beneficial owner(s); and

(E) a statement whether or not the stockholder giving the notice and/or the other Proposing Person(s), if any, will deliver a proxy statement and form of proxy to holders of, in the case of a business proposal, at least the percentage of voting power of all of the shares of capital stock of the Corporation required under applicable law to approve the proposal or, in the case of a nomination or nominations, at least the percentage of voting power of all of the shares of capital stock of the Corporation reasonably believed by such Proposing Person to be sufficient to elect the nominee or nominees proposed to be nominated by such stockholder (such statement, the "Solicitation Statement").

For purposes of this Article I of these by-laws, the term "Proposing Person" shall mean the following persons: (i) the stockholder of record providing the notice of nominations or business proposed to be brought before a stockholders' meeting, and (ii) the beneficial owner(s), if different, on whose behalf the nominations or business proposed to be brought before a stockholders' meeting is made. For purposes of this Section 10 of Article I of these by-laws, the term "Synthetic Equity Interest" shall mean any transaction, agreement or arrangement (or series of transactions, agreements or arrangements), including, without limitation, any derivative, swap, hedge, repurchase or so-called "stock borrowing" agreement or arrangement, the purpose or effect of which is to, directly or indirectly: (a) give a person or entity economic benefit and/or risk similar to ownership of shares of any class or series of capital stock of the Corporation, in whole or in part, including due to the fact that such transaction, agreement or arrangement provides, directly or indirectly, the opportunity to profit or avoid a loss from any increase or decrease in the value of any shares of any class or series of capital stock of the Corporation, (b) mitigate loss to, reduce the economic risk of or manage the risk of share price changes for, any person or entity with respect to any shares of any class or series of capital stock of the Corporation, (c) otherwise provide in any manner the opportunity to profit or avoid a loss from any decrease in the value of any shares of any class or series of capital stock of the Corporation, or (d) increase or decrease the voting power of any person or entity with respect to any shares of any class or series of capital stock of the Corporation.

(3) Notwithstanding anything in the second sentence of Article I, Section 10(a)(2) of this by-law to the contrary, in the event that the number of directors to be elected to the Board of Directors is increased and there is no public announcement naming all

of the nominees for director or specifying the size of the increased Board of Directors made by the Corporation at least ten (10) days before the last day a stockholder may deliver a notice of nomination in accordance with the second sentence of Article I, Section 10(a)(2), a stockholder's notice required by this by-law shall also be considered timely, but only with respect to nominees for any new positions created by such increase, if it shall be received by the Secretary of the Corporation not later than the close of business on the tenth (10th) day following the day on which such public announcement is first made by the Corporation.

(b) General.

(1) Only such persons who are nominated in accordance with the provisions of **Section 10 or Section 11 of this by-law Article I** shall be eligible for election and to serve as directors and only such business shall be conducted at an annual meeting as shall have been brought before the meeting in accordance with the provisions of **Section 10 or Section 11 of this by-law Article I** or in accordance with Rule 14a-8 under the Exchange Act. The Board of Directors or a designated committee thereof shall have the power to determine whether a nomination or any business proposed to be brought before the meeting was made in accordance with the provisions of this by-law. **If the Board of Directors or a designated committee thereof determines that any stockholder proposal or nomination was not made in accordance with the provisions of this by-law, such proposal or nomination shall be disregarded and shall not be presented for action at the annual meeting.**

(2) Except as otherwise required by law or **Article I, Section 11 of these by-laws**, nothing in this Article I, Section 10 shall obligate the Corporation or the Board of Directors to include in any proxy statement or other stockholder communication distributed on behalf of the Corporation or the Board of Directors information with respect to any nominee for director or any other matter of business submitted by a stockholder.

(3) Notwithstanding the foregoing provisions of this Article I, Section 10, if the nominating or proposing stockholder (or a qualified representative of the stockholder) does not appear at the annual meeting to present a nomination or any business, such nomination or business shall be disregarded, notwithstanding that proxies in respect of such vote may have been received by the Corporation. For purposes of this Article I, Section 10, to be considered a qualified representative of the proposing stockholder, a person must be authorized by a written instrument executed by such stockholder or an electronic transmission delivered by such stockholder to act for such stockholder as proxy at the meeting of stockholders and such person must produce such written instrument or electronic transmission, or a reliable reproduction of the written instrument or electronic transmission, to the presiding officer at the meeting of stockholders.

(4) For purposes of this by-law, "public announcement" shall mean disclosure in a press release reported by the Dow Jones Newswire, Bloomberg, GlobeNewswire, Associated Press or comparable national news service or in a document publicly filed by the Corporation with the Securities and Exchange Commission pursuant to Section 13, 14 or 15(d) of the Exchange Act.

(5) Notwithstanding the foregoing provisions of this by-law, a stockholder shall also comply with all applicable requirements of the Exchange Act and the rules and regulations thereunder with respect to the matters set forth in this by-law. Nothing in this by-law shall be deemed to affect any rights of stockholders to have proposals included in the Corporation's proxy statement pursuant to Rule 14a-8 (or any successor rule), as applicable, under the Exchange Act and, to the extent required by such rule, have such proposals considered and voted on at an annual meeting.

SECTION 11. Proxy Access Rights.

(a) Proxy Access Nomination.

(1) Whenever the Board of Directors solicits proxies with respect to the election of directors at an annual meeting of stockholders, nominations of individuals for election to the Board of Directors at such annual meeting may be made by (A) a stockholder or (B) a group of no more than 20 stockholders that satisfy the requirements of this Section 11 (as further qualified by the provisions of this Section 11, any such individual or group, including as the context requires each member thereof, being hereinafter referred to as an "Eligible Stockholder"). The nomination provisions set forth in this Section 11 are separate from, and in addition to, the nomination provisions set forth in Article I, Section 10. Subject to the provisions of this Section 11 and to the extent permitted by applicable law, the Corporation shall include in its proxy materials for such annual meeting, in addition to any persons nominated for election by, or at the direction of, a majority of the Board of Directors, the name, together with the Required Information (as defined below), of any person nominated for election (each such person being hereinafter referred to as a "Stockholder Nominee") to the Board of Directors by an Eligible Stockholder pursuant to this Section 11.

(2) For purposes of this Section 11, the "Required Information" that the Corporation will include in its proxy materials is (A) the information concerning the Stockholder Nominee and the Eligible Stockholder that is required to be disclosed in the Corporation's proxy statement by the rules and regulations promulgated under the Exchange Act, by these by-laws, by the certificate of incorporation and/or by the listing standards of each principal United States exchange upon which the common stock of the Corporation is listed and (B) the written statement, if any, consisting of five hundred (500) words or less delivered by the Eligible Stockholder pursuant to procedures set forth in Section 11(d)(4), in support of the Stockholder Nominee's candidacy that is clearly and specifically identified as the written statement that the Eligible Stockholder requests the Corporation to include in its proxy materials and does not include any references to any other statements or written materials in support of the Stockholder Nominee's candidacy or any website or other locations where any such statements or written materials may be found (the "Statement"). If the Eligible Stockholder has not provided to the Secretary a Statement within the time period specified in this Section 11 for delivering the Notice of Proxy Access Nomination, the Eligible Stockholder will be

deemed to have not provided the Statement and the Required Information will not include the Statement. Notwithstanding anything to the contrary contained in this Section 11, the Corporation may omit from its proxy materials any information or Statement (or portion thereof) if the Corporation believes that (A) such information is not true in all material respects or omits a material statement necessary to make the statements made not misleading; (B) such information directly or indirectly impugns the character, integrity or personal reputation of, or directly or indirectly makes charges concerning improper, illegal or immoral conduct or associations, without factual foundation, with respect to, any person; or (C) the inclusion of such information in the proxy statement would otherwise violate the Securities and Exchange Commission's proxy rules or any other applicable law, rule or regulation.

(b) Notice Requirements.

(1) In order to nominate a Stockholder Nominee pursuant to this Section 11, an Eligible Stockholder must, in addition to satisfying the other requirements of Section 11, provide to the Secretary a written notice expressly nominating its Stockholder Nominee(s) and electing to have its Stockholder Nominee(s) included in the Corporation's proxy materials pursuant to this Section 11 that complies with the requirements set forth in this Section 11 (a "Notice of Proxy Access Nomination") within the time period set forth below. In order for an Eligible Stockholder to nominate a Stockholder Nominee pursuant to this Section 11, the Eligible Stockholder's Notice of Proxy Access Nomination must be received by the Secretary at the principal executive office of the Corporation not later than 5:00 p.m., Eastern Time, on the one hundred twentieth (120th) calendar day prior to the first anniversary of the date of the proxy statement for the preceding year's annual meeting of stockholders and not earlier than the one hundred fiftieth (150th) calendar day prior to the first anniversary of the date of the proxy statement for the preceding year's annual meeting of stockholders; *provided, however*, that in the event that the date of the annual meeting of stockholders is advanced or delayed by more than thirty (30) calendar days from the first (1st) anniversary of the date of the preceding year's annual meeting of stockholders, the Notice of Proxy Access Nomination to be timely must be delivered not earlier than the one hundred fiftieth (150th) calendar day prior to the date of such annual meeting of stockholders and not later than 5:00 p.m., Eastern Time, on the later of the one hundred twentieth (120th) calendar day prior to the date of such annual meeting or the tenth (10th) calendar day following the day on which public announcement of the date of such meeting is first made. In no event shall an adjournment, postponement or rescheduling of any previously scheduled meeting of stockholders, or the public announcement thereof, commence a new time period for the giving of a Notice of Proxy Access Nomination under this Section 11.

(2) In order to nominate a Stockholder Nominee pursuant to this Section 11, an Eligible Stockholder providing the Required Information within the time period specified in Section 11(b)(1) for delivering the Notice of Proxy Access Nomination must further update and supplement such Required Information, if necessary, so that all such information provided or required to be provided shall be true and correct as of the close of business on the record date for purposes of determining the stockholders entitled to vote at such annual meeting and as of the date that is ten (10) business days prior to such annual meeting, and such update and supplement (or a written notice stating that there is no such update or supplement) must be delivered in writing to the Secretary at the principal executive office of the Corporation not later than 5:00 p.m., Eastern Time, on the fifth (5th) business day after the record date for purposes of determining the stockholders entitled to vote at the meeting (in the case of the update and supplement required to be made as of the record date), and not later than 5:00 p.m., Eastern Time, on the fifth (5th) business day prior to the date for the meeting (in the case of the update and supplement required to be made as of ten (10) business days prior to the meeting).

(3) In the event that any of the information or communications provided by the Eligible Stockholder or the Stockholder Nominee to the Corporation or its stockholders ceases to be true and correct in all material respects or omits a material fact necessary in order to make the statements made, in light of the circumstances under which they were made, not misleading, each Eligible Stockholder or Stockholder Nominee, as the case may be, shall promptly notify the Secretary of any defect in such previously provided information or communications and of the information that is required to correct any such defect.

(c) Maximum Number of Stockholder Nominees.

(1) The maximum number of Stockholder Nominees nominated by all Eligible Stockholders that will be included in the Corporation's proxy materials with respect to an annual meeting shall not exceed twenty percent (20%) of the number of directors in office as of the last day on which a Notice of Proxy Access Nomination may be timely delivered pursuant to and in accordance with this Section 11 (the "Final Proxy Access Nomination Date"), rounded down to the nearest whole number; *provided that* the maximum number of Stockholder Nominees that will be included in the Corporation's proxy materials with respect to an annual meeting will be reduced by (A) each Stockholder Nominee whose nomination is withdrawn by the Eligible Stockholder nominating such Stockholder Nominee or who becomes unwilling to serve on the Board of Directors, (B) each Stockholder Nominee who ceases to satisfy, or each Stockholder Nominee of an Eligible Stockholder that ceases to satisfy, the eligibility requirements in this Section 11, as determined by the Board of Directors, (C) each Stockholder Nominee whose name is submitted for inclusion in the Corporation's proxy materials pursuant to this Section 11 but who the Board of Directors has nominated as a Board nominee, and (D) the number of incumbent directors who had been Stockholder Nominees at either of the preceding two (2) annual meetings of stockholders and whose reelection at the upcoming annual meeting of stockholders is being recommended by the Board of Directors.

(2) Any Eligible Stockholder submitting more than one Stockholder Nominee for inclusion in the Corporation's proxy materials pursuant to this Section 11 shall rank such Stockholder Nominees based on the order that the Eligible Stockholder

desires such Stockholder Nominees to be selected for inclusion in the Corporation's proxy statement in the event that the total number of Stockholder Nominees submitted by Eligible Stockholders pursuant to this Section 11 exceeds the maximum number of Stockholder Nominees provided for in Section 11(c)(1) (including by operation of Section 11(c)(3)). In the event that the number of Stockholder Nominees submitted by Eligible Stockholders pursuant to this Section 11 for an annual meeting exceeds the maximum number of Stockholder Nominees provided for in Section 11(c)(1) (including by operation of Section 11(c)(3)), the highest ranking Stockholder Nominee who meets the requirements of this Section 11 from each Eligible Stockholder (with such determination and the determination of whether a stockholder or group of stockholders constitutes an Eligible Stockholder to be based on compliance with the provisions of this Section 11 as of the Final Proxy Access Nomination Date) will be selected for inclusion in the Corporation's proxy materials until the maximum number is reached, going in order from the largest to the smallest of such Eligible Stockholders based on the number of shares of common stock of the Corporation each Eligible Stockholder disclosed as owned by such Eligible Stockholder in the Notice of Proxy Access Nomination submitted to the Corporation hereunder. If the maximum number of Stockholder Nominees provided for in this Section 11 is not reached after the highest ranking Stockholder Nominee who meets the requirements of this Section 11 from each Eligible Stockholder determined in the manner set forth above has been selected, this selection process will continue as many times as necessary, following the same order each time, until the maximum number of Stockholder Nominees provided for in this Section 11 is reached. The Stockholder Nominees initially selected in accordance with this Section 11(c)(2) will be the only Stockholder Nominees eligible to be nominated or included in the Corporation's proxy materials pursuant to this Section 11. The Notices of Proxy Access Nomination and nominations of all of the remaining Stockholder Nominees not initially selected pursuant to this Section 11(c)(2) will be deemed to have been withdrawn by each of the applicable stockholders as of the Final Proxy Access Nomination Date, and, following such initial selection, if any one or more of the Stockholder Nominees so selected are (A) nominated by the Board of Directors or (B) not included in the Corporation's proxy materials or are not submitted for election for any reason, including, without limitation, a subsequent failure to comply with this Section 11 by the Eligible Stockholder or the Eligible Stockholder's withdrawal of the nomination, then, in each case, no additional Stockholder Nominees will be included in the Corporation's proxy materials or otherwise submitted for stockholder election pursuant to this Section 11.

(3) In the event that one or more vacancies for any reason occurs on the Board of Directors after the Final Proxy Access Nomination Date but before the date of the applicable annual meeting of stockholders and the Board of Directors reduces the size of the Board of Directors in connection therewith, the maximum number of Stockholder Nominees eligible to be nominated or included in the Corporation's proxy materials pursuant to this Section 11 shall be calculated based on the number of directors in office as so reduced. The Notices of Proxy Access Nomination and nominations of any Stockholder Nominees who cease to be eligible to be nominated or included in the Corporation's proxy materials pursuant to this Section 11 as a result of the operation of this Section 11(c)(3) will be deemed to have been withdrawn by each of the applicable Eligible Stockholders as of the Final Proxy Access Nomination Date.

(d) Stockholder Eligibility.

(1) For purposes of this Section 11, an Eligible Stockholder shall be deemed to "own" only those outstanding shares of common stock of the Corporation as to which the Eligible Stockholder possesses both (A) the entire voting and investment rights pertaining to the shares and (B) the entire economic interest in (including the opportunity for profit from and risk of loss on) such shares; provided that the number of shares calculated in accordance with clauses (A) and (B) (x) shall not include any shares (1) borrowed by such Eligible Stockholder for any purposes or purchased by such Eligible Stockholder pursuant to an agreement to resell, (2) sold by such Eligible Stockholder or any of its affiliates in any transaction that has not been settled or closed or (3) subject to any option, warrant, forward contract, swap, contract of sale, other derivative or similar agreement entered into by such Eligible Stockholder or any of its affiliates, whether any such instrument or agreement is to be settled with shares or with cash based on the notional amount or value of shares of outstanding common stock of the Corporation, in any such case which instrument or agreement has, or is intended to have, the purpose or effect of (I) reducing in any manner, to any extent or at any time in the future, such Eligible Stockholder's or its affiliates' full right to vote or direct the voting of any such shares by such Eligible Stockholder or any of its affiliates and/or (II) hedging, offsetting or altering to any degree any gain or loss realized or realizable from maintaining the entire economic ownership of such shares by such Eligible Stockholder or affiliate, and (y) shall be reduced by the notional amount of shares of common stock of the Corporation subject to any option, warrant, forward contract, swap, contract of sale, other derivative or similar agreement entered into by such Eligible Stockholder or any of its affiliates, whether or not any such instrument is to be settled with shares or with cash, to the extent the number of shares owned by the Eligible Stockholder was not already reduced by such amount pursuant to clause (x)(3) above, and a number of shares of common stock of the Corporation equal to the net "short" position in the common stock of the Corporation held by such Eligible Stockholder's affiliates, whether through short sales, options, warrants, forward contracts, swaps, contracts of sale, other derivatives or similar agreements or any other agreement or arrangement. An Eligible Stockholder shall "own" shares held in the name of a nominee or other intermediary so long as the Eligible Stockholder retains the right to instruct how the shares are voted with respect to the election of directors and possesses the entire economic interest in the shares. An Eligible Stockholder's ownership of shares shall be deemed to continue during any period in which the Eligible Stockholder (a) has delegated any voting power by means of a proxy, power of attorney or other instrument or arrangement which is unconditionally revocable at any time by the Eligible Stockholder and (b) has loaned the shares if the Eligible Stockholder has the power to recall such loan on three (3) business days' notice and has in fact recalled such loaned shares as of the time of the Notice of Proxy Access Nomination is provided and through and including the date of the Annual Meeting of Eligible Stockholders. The terms "owned," "owning" and other variations of the word "own" shall have correlative

meanings. Whether outstanding shares of common stock of the Corporation are “owned” for these purposes shall be determined by the Board of Directors or any committee thereof. For purposes of this Section 11, the term “affiliate” or “affiliates” shall have the meaning ascribed thereto under the General Rules and Regulations of the Exchange Act.

(2) In order to make a nomination pursuant to this Section 11, an Eligible Stockholder must have owned the Required Ownership Percentage (as defined below) of the Corporation’s outstanding common stock (the “Required Shares”) continuously for the Minimum Holding Period (as defined below) or longer as of both the Final Proxy Access Nomination Date and the close of business on the record date for determining stockholders entitled to vote at the applicable annual meeting, and must continue to own the Required Shares through the applicable annual meeting date (and any postponement or adjournment thereof); provided that, up to, but not more than, twenty (20) individual stockholders who otherwise meet all of the requirements to be an Eligible Stockholder may aggregate their stockholdings in order to meet the Required Ownership Percentage of the Required Shares; provided, however, that each member of such group must have owned such Required Shares continuously for the Minimum Holding Period or longer as of the Final Proxy Access Nomination Date, and must continue to own its portion of the Required Shares through the applicable annual meeting date (and any postponement or adjournment thereof). For purposes of this Section 11, the “Required Ownership Percentage” is three percent (3%) or more of the Corporation’s issued and outstanding common stock, and the “Minimum Holding Period” is the three- (3-) year period prior to the submission of the Notice of Proxy Access Nomination.

(3) Whenever the Eligible Stockholder consists of a group of more than one stockholder, each provision in this Section 11 that requires the Eligible Stockholder to provide any written statements, representations, undertakings, agreements or other instruments or to meet any other conditions shall be deemed to require each stockholder that is a member of such group to provide such statements, representations, undertakings, agreements or other instruments and to meet such other conditions. When an Eligible Stockholder is comprised of a group, a violation of any provision of these by-laws by any member of the group shall be deemed a violation by the entire Eligible Stockholder group. No stockholder may be a member of more than one group of persons constituting an Eligible Stockholder with respect to any annual meeting of stockholders.

(4) In addition to providing the Notice of Proxy Access Nomination in accordance with Section 11(b)(1) above, in order to nominate a Stockholder Nominee pursuant to this Section 11, an Eligible Stockholder or the Stockholder Nominee, as applicable, must provide the following information in writing to the Secretary within the time period specified in this Section 11 for delivering the Notice of Proxy Access Nomination:

(A) one or more written statements from the record holders of the Required Shares or from the intermediaries through which the shares are or have been held during the Minimum Holding Period verifying that, as of a date within seven (7) business days prior to the date the Notice of Proxy Access Nomination is received by the Secretary, the Eligible Stockholder owns, and has owned continuously for the Minimum Holding Period, the Required Shares, and the Eligible Stockholder’s agreement to provide the updates and supplements (or written notices stating that there are no such updates or supplements) described in Section 11(b)(2) within the time periods set forth therein;

(B) a copy of the Schedule 14N filed or to be filed with the Securities and Exchange Commission in accordance with Rule 14a-18 of the Exchange Act (and, if not included in such Schedule 14N, the details of any relationship that existed within the past three years and that would have been described pursuant to Item 6(e) of Schedule 14N (or any successor item) if it existed on the date of submission of the Schedule 14N);

(C) the Required Information (with the Statement, if any, clearly and specifically identified as such) and all other information, representations and agreements that are required to be set forth in a stockholder’s notice of nomination, or provided to the Corporation in order to nominate a Proposed Nominee, pursuant to Section 11;

(D) the written consent of each Stockholder Nominee to being named in the proxy statement as a nominee and to serving as a director if elected;

(E) in the case of a Notice of Proxy Access Nomination that is submitted by an Eligible Stockholder that is comprised of a group of stockholders, the designation by all of such stockholders of one of such stockholders that is authorized to act on behalf of all of such stockholders with respect to all matters relating to the nomination or inclusion in the Corporation’s proxy materials of the Stockholder Nominee(s) nominated by such Eligible Stockholder (the “Eligible Stockholder Designee”), including, without limitation, the withdrawal of such nomination;

(F) an agreement by each Stockholder Nominee, upon such Stockholder Nominee’s election, to make such acknowledgements, enter into such agreements and provide such information as the Board of Directors requires of all directors at such time, including without limitation, agreeing to be bound by the Corporation’s code of ethics, insider trading policies and procedures and other similar policies and procedures;

(G) an irrevocable resignation of the Stockholder Nominee, which shall become effective upon a determination in good faith by the Board of Directors or any committee thereof that the information provided to the Corporation by such individual pursuant to this Section 11 was untrue in any material respect or omitted to state a material fact necessary in order to make the statements made, in light of the circumstances under which they were made, not misleading;

(H) a representation (in the form provided by the Secretary upon written request) that the Eligible Stockholder (i) acquired the Required Shares in the ordinary course of business and not with the intent to change or influence control at the Corporation, and that the Eligible Stockholder does not presently have such intent, (ii) has not nominated

and will not nominate for election to the Board of Directors at the annual meeting (or any postponement or adjournment thereof) any person other than the Stockholder Nominee(s) being nominated pursuant to this Section 11, (iii) has not engaged and will not engage in, and has not and will not be a “participant” in, another person’s “solicitation” within the meaning of Rule 14a-1(l) under the Exchange Act in support of the election of any individual as a director at the annual meeting other than its Stockholder Nominee(s) or a nominee of the Board of Directors, (iv) will not distribute to any stockholder any form of proxy for the annual meeting other than the form of proxy distributed by the Corporation, (v) agrees to comply with all other laws and regulations applicable to any solicitation in connection with the annual meeting, including, without limitation, Rule 14a-9 promulgated under the Exchange Act, (vi) meets the requirements set forth in this Section 11, and (vii) has provided and will continue to provide facts, statements and other information in all communications with the Corporation and its stockholders in connection with the nomination hereunder that is or will be true and correct in all material respects and does not and will not omit to state a material fact necessary in order to make the statements made, in light of the circumstances under which they were made, not misleading; and

(l) a written undertaking (in the form provided by the Secretary upon written request) that the Eligible Stockholder agrees to (i) assume all liability stemming from any legal or regulatory violation arising out of the communications with stockholders of the Corporation by the Eligible Stockholder, its affiliates and associates, or their respective agents or representatives, either before or after the furnishing of the Notice of Proxy Access Nomination, or out of the facts, statements or information that the Eligible Stockholder or its Stockholder Nominee(s) has provided or will provide to the Corporation or filed with the Securities and Exchange Commission, (ii) indemnify and hold harmless the Corporation and each of its directors, officers, agents, employees, affiliates, control persons or other persons acting on behalf of the Corporation individually against any liability, loss or damages in connection with any threatened or pending action, suit or proceeding, whether legal, administrative or investigative, against the Corporation or any of its directors, officers, agents, employees, affiliates, control persons or other persons acting on behalf of the Corporation arising out of any nomination of a Stockholder Nominee submitted by the Eligible Stockholder pursuant to this Section 11, and (iii) promptly provide to the Corporation such additional information as requested pursuant to this Section 11.

(J) in connection with Section 11(d)(4)(A) above, if any intermediary which verifies the Eligible Stockholder’s ownership of the Required Shares for the Minimum Holding Period is not the record holder of such shares, a Depository Trust Company (“DTC”) participant or an affiliate of a DTC participant, then the Eligible Stockholder will also need to provide a written statement as required by Section 11(d)(4)(A) from the record holder of such shares, a DTC participant or an affiliate of a DTC participant that can verify the holdings of such intermediary.

(e) Stockholder Nominee Requirements.

(1) Notwithstanding anything in these by-laws to the contrary, the Corporation shall not be required to include, pursuant to this Section 11, any Stockholder Nominee in its proxy materials (and no such Stockholder Nominee may be nominated pursuant to this Section 11) for any annual meeting of stockholders (A) for which the Secretary receives a notice that the Eligible Stockholder or any other stockholder of the Corporation has nominated one or more persons for election to the Board of Directors pursuant to the advance notice requirements for Stockholder Nominees set forth in Article I, Section 10, (B) if the Eligible Stockholder who has nominated such Stockholder Nominee has engaged in or is currently engaged in, or has been or is a “participant” in another person’s “solicitation” within the meaning of Rule 14a-1(l) under the Exchange Act, in support of the election of any individual as a director at the annual meeting other than its Stockholder Nominee(s) or a nominee of the Board of Directors, (C) if such Stockholder Nominee is or becomes a party to any compensatory, payment or other financial agreement, arrangement or understanding with any person or entity other than the Corporation, or is receiving or will receive any such compensation or other payment from any person or entity other than the Corporation, in each case, in connection with service as a director of the Corporation, (D) who is not independent under the listing standards of each principal United States exchange upon which the common stock of the Corporation is listed, any applicable rules of the Securities and Exchange Commission and any publicly disclosed standards used by the Board of Directors in determining and disclosing independence of the Corporation’s directors, in each case, as determined by the Board of Directors or any committee thereof, (E) who does not meet the audit committee and compensation committee independence requirements under the rules of the primary stock exchange on which the common stock of the Corporation is listed, (F) who does not meet the director qualifications set forth in the Corporation’s Corporate Governance Guidelines and any other standards established by the Corporation, (G) whose election as a member of the Board of Directors would cause the Corporation to be in violation of these by-laws, the certificate of incorporation, the rules and listing standards of the principal United States exchanges upon which the common stock of the Corporation is listed or over-the-counter market on which any securities of the Corporation are traded, or any applicable state or federal law, rule or regulation, (H) who provides any information to the Corporation or its stockholders required or requested pursuant to any provision of these by-laws that is not accurate, truthful and complete in all material respects, or that otherwise contravenes any of the agreements, representations or undertakings made by the Stockholder Nominee in connection with the nomination, (I) who is or has been, within the past three years, an officer or director of a competitor, as defined in Section 8 of the Clayton Antitrust Act of 1914, (J) who is a defendant in or named subject of a pending criminal proceeding (excluding traffic violations) or has been convicted or has pleaded *nolo contendere* in such a criminal proceeding within the past ten (10) years, (K) is subject to any order of the type specified in Rule 506(d) of Regulation D promulgated under the Securities Act of 1933, as amended, (L) if such Stockholder Nominee or the applicable Eligible Stockholder shall have provided information to the Corporation in respect of such nomination that was untrue in any material respect or omitted to

state a material fact necessary in order to make the statement made, in light of the circumstances under which they were made, not misleading, as determined by the Board of Directors or any committee thereof, or (M) the Eligible Stockholder or applicable Stockholder Nominee fails to comply with its obligations pursuant to this Section 11.

(2) Any Stockholder Nominee who is included in the Corporation's proxy materials for a particular annual meeting of stockholders but either (A) withdraws from or becomes ineligible or unavailable for election to the Board of Directors at such annual meeting, or (B) does not receive a number of "for" votes equal to at least twenty five percent (25%) of the number of shares present and entitled to vote for the election of directors, will be ineligible for nomination or inclusion in the Corporation's proxy materials as a Stockholder Nominee pursuant to this Section 11 for the following two (2) annual meetings of stockholders.

(3) Notwithstanding anything to the contrary set forth herein, if the Board of Directors or a designated committee thereof determines that any stockholder nomination was not made in accordance with the terms of this Section 11 or that the information provided in a Notice of Proxy Access Nomination does not satisfy the informational requirements of this Section 11 in any material respect, then such nomination shall not be considered at the applicable annual meeting of stockholders. Additionally, such nomination will not be considered at the annual meeting in question if the Eligible Stockholder (or a qualified representative thereof) or, in the case of an Eligible Stockholder that is comprised of a group of stockholders, the Eligible Stockholder Designee (or a qualified representative thereof) does not appear at the applicable annual meeting to present any nomination of the Stockholder Nominee(s) included in the Corporation's proxy materials pursuant to this Section 11. For purposes of this Section 11, to be considered a qualified representative of a stockholder, a person must be duly authorized officer, manager or partner of such stockholder or must be authorized by a writing executed by such stockholder or an electronic transmission delivered by such stockholder to act for such stockholder as its proxy at the annual meeting and such person must produce such writing or electronic transmission, or a reliable reproduction thereof, at such annual meeting.

(4) For purposes of this Section 11, any determination to be made by the Board of Directors may be made by the Board of Directors, any committee thereof or any officer of the Corporation designated by the Board of Directors or a committee thereof, and any such determination shall be final and binding on any Eligible Stockholder, any Stockholder Nominee and any other person for purposes of this Section 11 so long as made in good faith (without any further requirements). If any intervening events, facts or circumstances arise subsequent to any such determination, the presiding officer of any annual meeting of stockholders, in addition to making any other determinations that may be appropriate to the conduct of the meeting, shall have the power and duty to determine whether a Stockholder Nominee has been nominated in accordance with the requirements of this Section 11 and, if not so nominated, shall direct and declare at the meeting that such Stockholder Nominee shall not be considered.

(f) This Section 11 provides the exclusive method for stockholders to include nominees for director in the Corporation's proxy materials. A stockholder's compliance with the procedures set forth in this Section 11 will not also be deemed to constitute compliance with the procedures set forth in, or notice of nomination pursuant to, Article I, Section 10.

(g) For the avoidance of doubt, the Corporation may solicit against, and include in the proxy statement its own statement relating to, any Stockholder Nominee.

ARTICLE II DIRECTORS

SECTION 1. General Powers. The business and affairs of the ~~corporation~~ **Corporation** shall be managed by or under the direction of a Board of Directors, who may exercise all of the powers of the ~~corporation~~ **Corporation** which are not by law required to be exercised by the stockholders. In the event of a vacancy in the Board of Directors, the remaining directors, except as otherwise provided by law, may exercise the powers of the full Board until the vacancy is filled.

SECTION 2. Number; Election; Tenure and Qualification. The initial Board of Directors shall consist of three persons and shall be elected by the incorporator. Thereafter, the number of directors which shall constitute the whole Board shall be fixed by resolution of the stockholders or the Board of Directors, but in no event shall be less than one. Each director shall be elected by the stockholders at the annual meeting and all directors shall hold office until the next annual meeting and until their successors are elected and qualified, or until their earlier death, resignation or removal. The number of directors may be increased or decreased by action of the stockholders or the Board of Directors. Directors need not be stockholders of the corporation.

SECTION 3. Enlargement of the Board. The number of the Board of Directors may be increased at any time, such increase to be effective immediately, by resolution of the stockholders or the Board of Directors.

SECTION 4. Vacancies. Any vacancy in the Board of Directors, however occurring, including a vacancy resulting from an enlargement of the Board and an unfilled vacancy resulting from an enlargement of the Board and an unfilled vacancy resulting from the removal of any director for cause or without cause, may be filled by resolution of the Board. A director elected to fill a vacancy shall hold office until the next annual meeting of stockholders and until his or her successor is elected and qualified or until his or her earlier death,

resignation or removal. When one or more directors shall resign from the Board, effective at a future date, the Board, shall have the power to fill such vacancy or vacancies, the vote thereon to take effect when such resignation or resignations shall become effective. If at any time there are no directors in office, then an election of directors may be held in accordance with the General Corporation Law of the State of Delaware.

SECTION 5. Resignation. Any director may resign at any time upon written notice to the corporation. Such resignation shall take effect at the time specified therein, or if no time is specified, at the time of its receipt by the President or Secretary.

SECTION 6. Removal. Except as may otherwise be provided by the General Corporation Law, any director or the entire Board of Directors may be removed, with or without cause, at an annual meeting or at a special meeting called for that purpose, by the holders of a majority of the shares then entitled to vote at an election of directors. The vacancy or vacancies thus created may be filled by the stockholders at the meeting held for the purpose of removal.

SECTION 7. Committees. The Board of Directors may, by resolution or resolutions passed by a majority of the whole Board of Directors, designate one or more committees, each committee to consist of two or more directors of the corporation. The Board of Directors may designate one or more directors as alternate members of any committee, who may replace any absent or disqualified member at any meeting of the committee. In the absence or disqualification of any member of such committee or committees, the member or members thereof present at any meeting and not disqualified from voting, whether or not such member or members constitute a quorum, may unanimously appoint another member of the Board of Directors to act at the meeting in the place of such absent or disqualified member.

A majority of all the members of any such committee may fix its rules of procedure, determine its action and fix the time and place, whether within or without the State of Delaware, of its meetings and specify what notice thereof, if any, shall be given, unless the Board of Directors shall otherwise by resolution provide. The Board of Directors shall have the power to change the members of any such committee at any time, to fill vacancies therein and to discharge any such committee, either with or without cause, at any time.

Any such committee, unless otherwise provided in the resolution of the Board of Directors, or in these by-laws, shall have and may exercise all the powers and authority of the Board of Directors in the management of the business and affairs of the corporation, and may authorize the seal of the corporation to be affixed to all papers which may require it; but no such committee shall have such power or authority in reference to amending the certificate of incorporation, adopting an agreement of merger or consolidation, recommending to the stockholders the sale, lease or exchange of all or substantially all of the corporation's property and assets, recommending a dissolution of the corporation or a revocation of a dissolution, or amending the by-laws of the corporation, and, unless the resolution or these by-laws expressly so provide, no such committee shall have the power or the authority to declare a dividend or to authorize the issuance of stock.

Each committee shall keep regular minutes of its meetings and make such reports as the Board of Directors may from time to time request.

SECTION 8. Meetings of the Board of Directors. Regular meetings of the Board of Directors may be held without call or formal notice at such places either within or without the State of Delaware and at such times as the Board may by vote from time to time determine. A regular meeting of the Board of Directors may be held without call or formal notice immediately after and at the same place as the annual meeting of the stockholders, or any special meeting of the stockholders at which a Board of Directors is elected.

Special meetings of the Board of Directors may be held at any place either within or without the State of Delaware at any time when called by the Chairman of the Board of Directors, the President, Treasurer, Secretary, or two or more directors. Reasonable notice of the time and place of a special meeting shall be given to each director unless such notice is waived by attendance or by written waiver in the manner provided in these by-laws for waiver of notice of stockholders. No notice of any adjourned meeting of the Board of Directors shall be required. In any case it shall be deemed sufficient notice to a director to send notice by mail at least seventy-two hours, or by telegram at least forty-eight hours, before the meeting, addressed to such director at his or her usual or last known business or home address.

Directors or members of any committee designated by the directors may participate in a meeting of the Board of Directors or such committee by means of conference telephone or similar communications equipment by means of which all persons participating in the meeting can hear each other, and participation by such means shall constitute presence in person at such meeting.

SECTION 9. Quorum and Voting. A majority of the total number of directors shall constitute a quorum, except that when a vacancy or vacancies exist in the Board, a majority of the directors then in office (but not less than one-third of the total number of the directors) shall constitute a quorum, and except that a lesser number of directors consisting of a majority of the directors then in office who are not officers (but not less than one-third of the total number of directors) may constitute a quorum for the purpose of acting on any matter relating to the compensation (including fringe benefits) of an officer of the corporation. A majority of the directors present, whether or not a quorum is present, may adjourn any meeting from time to time. The vote of a majority of the directors present at any meeting at which a quorum is present shall be the act of the Board of Directors, except where a different vote is required or permitted by law, by the certificate of incorporation, or by these by-laws.

SECTION 10. Compensation. The Board of Directors may fix fees for their services and for their membership on committees, and expenses of attendance may be allowed for attendance at each meeting. Nothing herein contained shall be construed to preclude any director from serving the corporation in any other capacity as an officer, agent or otherwise, and receiving compensation therefor.

SECTION 11. Action Without Meeting. Any action required or permitted to be taken at any meeting of the Board of Directors, or of any committee thereof, may be taken without a meeting, and without notice, if a written consent thereto is signed by all members of the Board of Directors, or of such committee, as the case may be, and such written consent is filed with the minutes of proceedings of the Board of Directors or such committee.

ARTICLE III OFFICERS

SECTION 1. Titles. The officers of the corporation shall consist of a President, a Secretary, a Treasurer, and such other officers with such other titles as the Board of Directors shall determine, including without limitation a Chairman of the Board, a Vice-Chairman of the Board, and one or more Vice-Presidents, Assistant Treasurers, or Assistant Secretaries.

SECTION 2. Election and Term of Office. The officers of the corporation shall be elected annually by the Board of Directors at its first meeting following the annual meeting of the stockholders. Each officer shall hold office until his or her successor is elected and qualified, unless a different term is specified in the vote electing such officer, or until his or her earlier death, resignation or removal.

SECTION 3. Qualification. Unless otherwise provided by resolution of the Board of Directors, no officer, other than the Chairman or Vice-Chairman of the Board, need be a director. No officer need be a stockholder. Any number of offices may be held by the same person, as the directors shall determine, but no person may hold the offices of President and Secretary simultaneously.

SECTION 4. Removal. Any officer may be removed, with or without cause, at any time, by resolution adopted by the Board of Directors.

SECTION 5. Resignation. Any officer may resign by delivering a written resignation to the corporation at its principal office or to the President or Secretary. Such resignation shall be effective upon receipt or at such later time as shall be specified therein.

SECTION 6. Vacancies. The Board of Directors may at any time fill any vacancy occurring in any office for the unexpired portion of the term and may leave unfilled for such period as it may determine any office other than those of President, Treasurer and Secretary.

SECTION 7. Powers and Duties. The officers of the corporation shall have such powers and perform such duties as are specified herein and as may be conferred upon or assigned to them by the Board of Directors, and shall have such additional powers and duties as are incident to their office except to the extent that resolutions of the Board of Directors are inconsistent therewith.

SECTION 8. President and Vice-Presidents. The President shall be the chief executive officer of the corporation, shall preside at all meetings of the stockholders and the Board of Directors unless a Chairman or Vice-Chairman of the Board is elected by the Board, empowered to preside, and present at such meeting, shall have general and active management of the business of the corporation and general supervision of its officers, agents and employees, and shall see that all orders and resolutions of the Board of Directors are carried into effect.

In the absence of the President or in the event of his or her inability or refusal to act, the Vice-President if any (or in the event there be more than one Vice-President, the Vice-Presidents in the order designated by the directors, or in the absence of any designation, then in the order of their election) shall perform the duties of the President, and when so acting, shall have all the powers of and be subject to all the restrictions upon the President. The Board of Directors may assign to any Vice-President the title of Executive Vice-President, Senior Vice-President or any other title selected by the Board of Directors.

SECTION 9. Secretary and Assistant Secretaries. The Secretary shall attend all meetings of the Board of Directors and of the stockholders and record all the proceedings of such meetings in a book to be kept for that purpose, shall give, or cause to be given, notice of all meetings of the stockholders and special meetings of the Board of Directors, shall maintain a stock ledger and prepare lists of stockholders and their addresses as required and shall have custody of the corporate seal which the Secretary or any Assistant Secretary shall have authority to affix to any instrument requiring it and attest by any of their signatures. The Board of Directors may give general authority to any other officer to affix and attest the seal of the corporation.

The Assistant Secretary if any (or if there be more than one, the Assistant Secretaries in the order determined by the Board of Directors or if there be no such determination, then in the order of their election) shall, in the absence of the Secretary or in the event of the Secretary's inability or refusal to act, perform the duties and exercise the powers of the Secretary.

SECTION 10. Treasurer and Assistant Treasurers. The Treasurer shall have the custody of the corporate funds and securities, shall keep full and accurate accounts of receipts and disbursements in books belonging to the corporation and shall deposit all moneys and

other valuable effects in the name and to the credit of the corporation in such depositories as may be designated by the Board of Directors. The Treasurer shall disburse the funds of the corporation as may be ordered by the Board of Directors or the President, taking proper vouchers for such disbursements, and shall render to the President and the Board of Directors, at its regular meetings, or whenever they may require it, an account of all transactions and of the financial condition of the corporation.

The Assistant Treasurer if any (or if there be more than one, the Assistant Treasurers in the order determined by the Board of Directors or if there be no such determination, then in the order of their election) shall, in the absence of the Treasurer or in the event of his or her inability or refusal to act, perform the duties and exercise the powers of the Treasurer.

SECTION 11. Bonded Officers. The Board of Directors may require any officer to give the corporation a bond in such sum and with such surety or sureties as shall be satisfactory to the Board of Directors upon such terms and conditions as the Board of Directors may specify, including without limitation a bond for the faithful performance of the duties of such officer and for the restoration to the corporation of all property in his or her possession or control belonging to the corporation.

SECTION 12. Salaries. Officers of the corporation shall be entitled to such salaries, compensation or reimbursement as shall be fixed or allowed from time to time by the Board of Directors.

ARTICLE IV STOCK

SECTION 1. Certificates of Stock. One or more certificates of stock, signed by the Chairman or Vice-Chairman of the Board of Directors or by the President or Vice-President and by the Treasurer or an Assistant Treasurer or the Secretary or an Assistant Secretary, shall be issued to each stockholder certifying, in the aggregate, the number of shares owned by the stockholder in the corporation. Any or all signatures on any such certificate may be facsimile. In case any officer who shall have signed or whose facsimile signature shall have been placed upon a certificate shall have ceased to be such officer before such certificate is issued, it may be issued by the corporation with the same effect as if he were such officer at the date of issue.

Each certificate for shares of stock which are subject to any restriction on transfer pursuant to the certificate of incorporation, the by-laws, applicable securities laws, or any agreement among any number of shareholders or among such holders and the corporation shall have conspicuously noted on the face or back of the certificate either the full text of the restriction or a statement of the existence of such restriction.

SECTION 2. Transfer of Share of Stock. Subject to the restrictions, if any, stated or noted on the stock certificates, shares of stock may be transferred on the books of the corporation by the surrender to the corporation or its transfer agent of the certificate representing such shares properly endorsed or accompanied by a written assignment or power of attorney properly executed, and with such proof of authority or the authenticity of signature as the corporation or its transfer agent may reasonably require. The corporation shall be entitled to treat the record holder of stock as shown on its books as the owner of such stock for all purposes, including the payment of dividends and the right to vote with respect to that stock, regardless of any transfer, pledge or other disposition of that stock, until the shares have been transferred on the books of the corporation in accordance with the requirements of these by-laws.

SECTION 3. Lost Certificates. A new certificate of stock may be issued in the place of any certificate theretofore issued by the corporation and alleged to have been lost, stolen, destroyed, or mutilated, upon such terms in conformity with law as the Board of Directors shall prescribe. The directors may, in their discretion, require the owner of the lost, stolen, destroyed or mutilated certificate, or the owner's legal representatives, to give the corporation a bond, in such sum as they may direct, to indemnify the corporation against any claim that may be made against it on account of the alleged loss, theft, destruction or mutilation of any such certificate, or the issuance of any such new certificate.

SECTION 4. Record Date. The Board of Directors may fix in advance a record date for the determination of the stockholders entitled to notice of or to vote at any meeting of stockholders or to express consent to corporate action in writing without a meeting, or entitled to receive payment of any dividend or other distribution or allotment of any rights in respect of any change, conversion or exchange of stock, or for the purpose of any other lawful action. Such record date shall not be more than 60 nor less than 10 days before the date of such meeting, nor more than 60 days prior to any other action to which such record date relates.

If no record date is fixed, the record date for determining stockholders entitled to notice of or to vote at a meeting of stockholders shall be at the close of business on the day before the day on which notice is given, or, if notice is waived at the close of business on the day before the day on which the meeting is held. The record date for determining stockholders entitled to express consent to corporate action in writing without a meeting, when no prior action by the Board of Directors is necessary, shall be the day on which the first written consent is expressed. The record date for determining stockholders for any other purpose shall be at the close of business on the day on which the Board of Directors adopts the resolution relating to such purpose.

A determination of stockholders of record entitled to notice of or to vote at a meeting of stockholders shall apply to any adjournment of the meeting; provided, however, that the Board of Directors may fix a new record date for the adjourned meeting.

SECTION 5. Fractional Share Interests. The corporation may, but shall not be required to, issue fractions of a share. If the corporation does not issue fractions of a share, it shall (1) arrange for the disposition of fractional interests by those entitled thereto, (2) pay in cash the fair value of fractions as determined, or (3) issue scrip or warrants in registered or bearer form which shall entitle the holder to receive a certificate for a full share upon the surrender of such scrip or warrants aggregating a full share. A certificate for a fractional share shall, but scrip or warrants shall not unless otherwise provided therein, entitle the holder to exercise voting rights, to receive dividends thereon, and to participate in any of the assets of the corporation in the event of liquidation. The Board of Directors may cause scrip or warrants to be issued subject to the conditions that they shall become void if not exchanged for certificates representing full shares before a specified date, or subject to the conditions that the shares for which scrip or warrants are exchangeable may be sold by the corporation and the proceeds thereof distributed to the holders of scrip or warrants, or subject to any other conditions which the Board of Directors may impose.

SECTION 6. Dividends. Subject to the provisions of the certificate of incorporation, the Board of Directors may, out of funds legally available therefor, at any regular or special meeting, declare dividends upon the common stock of the corporation as and when they deem expedient.

ARTICLE V INDEMNIFICATION AND INSURANCE

SECTION 1. Indemnification. The corporation shall, to the full extent permitted by the General Corporation Law of the State of Delaware, as amended from time to time, and the certificate of incorporation, indemnify each person whom it may indemnify pursuant thereto.

SECTION 2. Insurance. The corporation shall have power to purchase and maintain insurance on behalf of any person who is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise against any liability asserted against such person and incurred by such person in any capacity or arising out of such person's status as such, whether or not the corporation would have the power to indemnify such person against such liability under the provisions of the General Corporation Law of the State of Delaware.

ARTICLE VI GENERAL PROVISIONS

SECTION 1. Fiscal Year. Except as otherwise designated from time to time by the Board of Directors, the fiscal year of the corporation shall begin on the first day of January and end on the last day of December.

SECTION 2. Corporate Seal. The corporate seal shall be in such form as shall be approved by the Board of Directors. The Secretary shall be the custodian of the seal. The Board of Directors may authorize a duplicate seal to be kept and used by any other officer.

SECTION 3. Certificate of Incorporation. All references in these by-laws to the certificate of incorporation shall be deemed to refer to the certificate of incorporation of the corporation, as in effect from time to time.

SECTION 4. Execution of Instruments. The President, any Vice-President, or the Treasurer shall have power to execute and deliver on behalf and in the name of the corporation any instrument requiring the signature of an officer of the corporation, including deeds, contracts, mortgages, bonds, notes, debentures, checks, drafts, and other orders for the payment of money. In addition, the Board of Directors may expressly delegate such powers to any other officer or agent of the corporation.

SECTION 5. Voting of Securities. Except as the directors may otherwise designate, the President or Treasurer may waive notice of, and act as, or appoint any person or persons to act as, proxy or attorney-in-fact for this corporation (with or without power of substitution) at any meeting of stockholders or shareholders of any other corporation or organization the securities of which may be held by this corporation.

SECTION 6. Evidence of Authority. A certificate by the Secretary, or an Assistant Secretary, or a temporary secretary, as to any action taken by the stockholders, directors, a committee or any officer or representative of the corporation shall, as to all persons who rely on the certificate in good faith, be conclusive evidence of that action.

SECTION 7. Transactions with Interested Parties. No contract or transaction between the corporation and one or more of the directors or officers, or between the corporation and any other corporation, partnership, association, or other organization in which one or more of the directors or officers are directors or officers, or have a financial interest, shall be void or voidable solely for that reason, or

solely because the director or officer is present at or participates in the meeting of the Board of Directors or a committee of the Board of Directors which authorizes the contract or transaction or solely because the vote of any such director is counted for such purpose, if:

(1) The material facts as to the relationship or interest and as to the contract or transaction are disclosed or are known to the Board of Directors or the committee, and the Board or committee in good faith authorizes the contract or transaction by the affirmative votes of a majority of the disinterested directors, even though the disinterested directors be less than a quorum; or

(2) The material facts as to the relationship or interest and as to the contract or transaction are disclosed or are known to the stockholders entitled to vote therein, and the contract or transaction is approved by the stockholders; or

(3) The contract or transaction is fair as to the corporation as of the time it is authorized, approved or ratified by the Board of Directors, a committee of the Board of Directors, or the stockholders.

Common or interested directors may be counted in determining the presence of a quorum at a meeting of the Board of Directors or of a committee which authorizes the contract or transaction.

SECTION 8. Books and Records. The books and records of the corporation shall be kept at such places within or without the State of Delaware as the Board of Directors may from time to time determine.

ARTICLE VII AMENDMENTS

SECTION 1. By the Stockholders or the Board of Directors. These by-laws may be altered, amended or repealed by the affirmative vote of the holders of a majority of the shares of the capital stock of the corporation issued and outstanding and entitled to vote at any regular meeting of stockholders, or at any special meeting of stockholders provided notice of such alteration, amendment, repeal or adoption of new by-laws shall have been stated in the notice of such special meeting. These by-laws also may be altered, amended or repealed by a vote of the majority of the Board of Directors; provided, however, that the Board of Directors shall not have power to alter, amend or repeal the provisions of Section 6 of Article I, Section 1 of Article V or this Article VII of the by-Laws and provided, further, that the Board of Directors may not alter, amend or repeal any amendment to these by-laws adopted by the stockholders after May 18, 2017.