



**Registrant's telephone number, including area code: (646) 975-2500**

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

<b>Title of each class</b>	<b>Name of each exchange on which registered</b>
Common Stock, par value \$0.0013 per share	The Nasdaq Stock Market LLC

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

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

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

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

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

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K.

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

Large accelerated filer Accelerated filer  
Non-accelerated filer Smaller reporting company

Emerging Growth Company

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

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

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The aggregate market value of the voting and non-voting stock held by non-affiliates of the registrant on June 30, 2018, based upon the closing price of the Common Stock on The Nasdaq Stock Market LLC on that date of \$8.04 per share, was \$380,418,164 <sup>(1)</sup>.

Calculated by excluding all shares that may be deemed to be beneficially owned by executive officers, directors and <sup>(1)</sup>five percent stockholders of the registrant, without conceding that any such person is an “affiliate” of the registrant for purposes of the federal securities laws.

As of April 25, 2019, a total of 84,542,514 shares of Common Stock, par value \$.0013 per share, were outstanding.

**DOCUMENTS INCORPORATED BY REFERENCE**

None.

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**EXPLANATORY NOTE**

This Amendment No. 1 on Form 10-K/A (this “Amendment”) amends the Annual Report on Form 10-K of Progenics Pharmaceuticals, Inc. (“Progenics” or the “Company”) for the year ended December 31, 2018, originally filed with the U.S. Securities and Exchange Commission (the “SEC”) on March 15, 2019 (the “Original Filing”). This Form 10-K/A is being filed solely to present the information required in Part III of Form 10-K that previously was omitted from the Original Filing in reliance on General Instruction G(3) to Form 10-K. General Instruction G(3) to Form 10-K allows such omitted information to be filed as an amendment to the Original Filing or incorporated by reference from the registrant’s definitive proxy statement that involves the election of directors not later than 120 days after the end of the fiscal year covered by the Original Filing. We are filing this Form 10-K/A to include the information required by Part III of the Original Filing because we do not intend to file a definitive proxy statement within 120 days after the end of our fiscal year covered by the Original Filing.

In accordance with Rule 12b-15 under the Securities Exchange Act of 1934, as amended (the “Exchange Act”), Part III of the Original Filing is hereby amended and restated in its entirety and Part IV, Item 15 of the Original Filing is hereby amended to reflect the new certifications filed by our principal executive officers and our principal financial officers as exhibits to this Form 10-K/A. Except as described in this explanatory note, no other information in the Original Filing is being modified or amended by this Form 10-K/A.

Except as described above and set forth in this Amendment, no other changes have been made to the Original Filing. Unless expressly stated, this Amendment does not reflect events occurring after the filing of the Original Report, nor does it modify or update in any way the disclosures contained in the Original Report, which speak as of the date of the Original Filing. Accordingly, this Amendment should be read in conjunction with the Original Filing and the Company’s other SEC filings subsequent to the filing of the Original Report. Some of the information provided in this Amendment may be superseded by the information provided in the 2019 Proxy Statement to be filed with the SEC.

Unless otherwise indicated by the context, references to “we,” “us,” and “our” refer specifically to Progenics Pharmaceuticals, Inc. All capitalized terms used but not defined herein have the meanings given to them in the Original Filing.

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**PART III**

**Item 10. Directors, Executive Officers and Corporate Governance**

**EXECUTIVE AND OTHER OFFICERS**

Information concerning our executive officers and members of our board of directors (the “Board”) is set forth below. There are no family relationships between any of our directors and executive officers. None of the organizations identified below with which an officer has previously been employed or associated is a parent, subsidiary or affiliate of the Company.

<b>Name</b>	<b>Position(s) with the Company</b>
Mark R. Baker	Chief Executive Officer
Asha Das	Chief Medical Officer
Patrick Fabbio	Executive Vice President and Chief Financial Officer
Benedict Osorio	Chief Operating Officer
Bryce Tenbarge	Senior Vice President, Commercial
Vivien Wong	Executive Vice President, Development
Peter J. Crowley	Director
Bradley L. Campbell	Director
Karen J. Ferrante	Director
Michael D. Kishbauch	Director
David A. Scheinberg	Director
Nicole S. Williams	Director

**Executive Officers**

*Mr. Baker*’s biographical information is set forth below under the heading “Directors.”

*Dr. Das*, 54, joined us in January 2019 as Chief Medical Officer. Dr. Das most recently served as Tocagen Inc.’s Chief Medical Officer, where she led the development of the company’s cancer-selective gene therapy platform. From April 2008 to April 2015, Dr. Das served at Genentech Inc., a member of the Roche Group, in positions of increasing responsibility, initially as Associate Medical Director and ultimately as Group Medical Director. She was responsible for leading activities related to the approval and launch of Avastin in recurrent glioblastoma, expansion into platinum-resistant ovarian cancer and metastatic cervical cancer as well as clinical activities related to TECENTRIQ®.

From 2005 to 2008, Dr. Das served as Associate Medical Director at Eisai Inc., a pharmaceutical company, where she focused on clinical activities related to the oncology therapeutics HALAVEN® and LENVIMA™. Prior to that, Dr. Das was head of the neuro-oncology program at Cedars-Sinai Medical Center.

Dr. Das is certified in neurology by the American Board of Psychiatry and Neurology and in the sub-specialty of neuro-oncology by the United Council for Neurologic Subspecialties and previously served as a clinical fellow in neuro-oncology at Massachusetts General Hospital. Dr. Das completed her residency in neurology at Cornell Medical Center and has held academic appointments at the University of California, Los Angeles; University of California, San Francisco; and National University of Singapore. Dr. Das obtained her medical degree and bachelor's degree from Cornell University.

**Mr. Fabbio**, 51, joined us in November 2015 as Senior Vice President and Chief Financial Officer. Prior to joining us, he was Chief Financial Officer of electroCore, a privately-held bioelectric medicine healthcare company, and Vice President, Finance for NPS Pharmaceuticals, Inc., a publicly traded, global rare disease company. Mr. Fabbio has more than 20 years of financial leadership experience in both public and private life science and pharmaceutical companies including: Vice President, Finance, Catalent Pharma Solutions; Chief Financial Officer of Ikano Therapeutics; senior corporate finance, commercial, and transactional roles at Sanofi; and Corporate Controller for Biomatrix Inc., a publicly traded biotechnology company that was acquired by Genzyme. He also joined the board of directors of BeyondSpring Inc. on January 1, 2018. He graduated from Pace University with a B.B.A. in Accounting and from the Stern School of Business at New York University with an M.B.A. in Finance. He received his certified public accountant license in New Jersey.



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**Mr. Osorio**, 62, initially joined us in July 2005 until October 2012 and returned in February 2018 and is currently our Chief Operating Officer. He has over three decades of experience in pharmaceutical quality control and quality assurance, including service as Vice President, Quality Assurance at Acorda Therapeutics, Vice President, Quality Assurance at Achillion Pharmaceuticals, Vice President, Quality Operations North America at Valeant Pharmaceuticals, Global Head of Quality for Braeburn Pharmaceuticals, Senior Consultant at Complya Consulting, Vice President and Senior Vice President, Quality at Progenics Pharmaceuticals, Director and Senior Director at Forest Laboratories, various positions of increasing responsibility with The PF Laboratories (a subsidiary of Purdue Pharma), ultimately as Executive Director, Quality Assurance and analytical chemist with Berlex Laboratories. He earned both an M.B.A. and an M.S. in chemistry from Seton Hall University and a B.S. in forensic science from John Jay College of Criminal Justice.

**Mr. Tenbarge**, 46, joined us in August 2016 and currently serves as Senior Vice President, Commercial. Prior to joining us, he was Vice President of Marketing and Commercialization at Celldex Therapeutics, a publicly-traded biotechnology company. Mr. Tenbarge has more than 15 years of commercial leadership experience with highly specialized products including: Senior Director of Global Oncology Marketing at Teva Pharmaceuticals and a variety of roles of increasing responsibility at Bristol-Myers Squibb Company in professional and payer marketing, market research and business intelligence. Mr. Tenbarge started his career as a commodity trader at Archer Daniels Midland in Chicago prior to receiving his M.B.A. from The Ross School of Business at the University of Michigan.

**Dr. Wong**, 62, joined us in September 2007 and currently serves as Executive Vice President, Development. For three years prior to joining us, Dr. Wong was Principal at Theritas Pharmaceutical Consultants. From 1989 to 2004, she held positions of increasing responsibility in preclinical development and pharmacology at Emisphere Technologies, Vivoquest, and Regeneron Pharmaceuticals. Dr. Wong has been a co-author on over 30 scientific articles for peer-reviewed journals. She received a B.Sc. in biology from the Mississippi University for Women, a Ph.D. in anatomy and neurobiology from the University of Maryland School of Medicine, and completed a postdoctoral fellowship in neurology at the Albert Einstein College of Medicine.

**Directors**

**Mr. Crowley**, 60, joined our Board in February 2009. He is currently an Advisory Partner of WindRose Health Investors (formerly MTS Health Partners, L.P.), a New York based healthcare merchant bank, and an Operating Partner at JH Partners LLC, a private equity firm, in which capacities he has served since 2011 and 2008, respectively. Mr. Crowley retired in 2008 as Managing Director of the Healthcare Investment Banking group at Oppenheimer & Co. Inc. (formerly CIBC World Markets Inc.), which he headed since 1995, with responsibility for public and private financing and advisory services for biotechnology, pharmaceutical, medical device and healthcare services companies. Mr. Crowley serves on the board of directors of the Foundation Fighting Blindness. He is also a board member at Medical Knowledge Group, an analytics driven marketing service company and Anabios, a private biotechnology company. He served until October 2017, as a director of Celerion, a contract research organization. Mr. Crowley holds an M.B.A. in finance from Columbia University Graduate School of Business and a B.A. in economics from Harvard University.

Mr. Crowley brings to the Board deep perspective into U.S. and international capital markets and strategic business trends. As a senior investment banker specializing in the healthcare industry, Mr. Crowley developed financial and analytic capabilities which are key inputs in the development of the Company's strategic direction, the setting of goals for its financial and operational plans, and the oversight of its financial reporting and audit functions. He has extensive knowledge of, and contacts with major participants in, the global biotechnology and pharmaceutical industries, as well as a wealth of experience evaluating the performance of businesses and products in the Company's industry and designing appropriate strategic and financial alternatives for them.

**Mr. Baker**, 64, Chief Executive Officer ("CEO"), joined us in 2005 as Senior Vice President & General Counsel and Secretary. In 2008, he was appointed Executive Vice President, Corporate, in 2009 became President and a director, and has been CEO since March 2011. From 2003 to 2005, Mr. Baker was Chief Business Officer, Secretary and a director of New York Trans Harbor LLC, a privately-held ferry operation in New York City. From 1997 to 2001, he was Executive Vice President, Chief Legal Officer and Secretary of Continental Grain Company, a privately-held international agribusiness and financial concern. Prior thereto, he was a partner and Co-Chairman of the Capital Markets Group of the New York law firm, Dewey Ballantine LLP. Mr. Baker also serves as Chairman of the board of directors of the Brooklyn Bridge Park Conservatory. He has an A.B. degree from Columbia College and a J.D. from the Columbia University School of Law.

Mr. Baker's qualifications for serving as a director of the Company include his 30 years of business and legal experience, a significant portion of which has been in the life sciences industry. Mr. Baker has been involved in the senior management of the organizations with which he worked before joining the Company, and has extensive experience managing public and private companies, including specific experience with respect to the financial, accounting, audit, human resources, intellectual property, legal, environmental, insurance, scientific and operational aspects of businesses in diverse industries. He has also served as a legal and business advisor to numerous boards of directors of public and private entities.

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**Mr. Campbell**, 43, joined our Board in June 2016. He has over 15 years of experience in the orphan drug industry and is currently serving as President and Chief Operating Officer and a director of Amicus Therapeutics, Inc. (Nasdaq: FOLD). In this capacity, he leads the global commercial organization responsible for the commercialization of Galafold™ for the treatment of Fabry Disease. He also oversees the Technical Operations, Market Access, and Program Management functions. Prior to Amicus, Mr. Campbell spent time in various commercial and business development roles at Genzyme Corp. and Bristol-Myers Squibb Company and as a strategy consultant for Marakon Associates. He is a member of the BioNJ board of directors and also a past President of the National Tay-Sachs and Allied Diseases Association where he currently serves on their Corporate Advisory Council. Mr. Campbell received a B.A. in Public Policy from Duke University and an M.B.A. from Harvard Business School.

Mr. Campbell's qualifications for serving as a member of our Board include his extensive experience in the pharmaceutical industry in the areas of corporate strategy, commercial operations and planning, business development and sales and marketing.

**Dr. Ferrante**, 61, joined our Board in January 2014. From April 2014 to August 2016, she was the head of Research and Development and Chief Medical Officer of Tokai Pharmaceuticals, Inc., a publicly traded biopharmaceutical company developing treatments for prostate cancer and other hormonally driven diseases. From 2007 to July 2013, Dr. Ferrante held senior positions at Millennium Pharmaceuticals, Inc. and its parent company, Takeda Pharmaceutical Company Limited, including Chief Medical Officer and most recently as Oncology Therapeutic Area Head and Cambridge USA Site Head from May 2013 to July 2013. From 1999 to 2007, she held positions of increasing responsibility at Pfizer Global Research & Development, culminating as Vice President, Oncology Development. She began her career in the pharmaceutical industry in 1995 as Associate Director of Clinical Oncology at Bristol-Myers Squibb Company. Prior to that, she was at the New England Deaconess Hospital in Boston (Beth Israel Deaconess), where she completed her internship and residency in internal medicine followed by her fellowship in hematology and oncology. While at Beth Israel Deaconess, she served as Instructor, Clinical Instructor and Clinical Fellow in Medicine at the Harvard Medical School. Dr. Ferrante serves on the Boards of MacroGenics, Inc., a publicly traded clinical-stage biopharmaceutical company focused on discovering and developing innovative monoclonal antibody-based therapeutics for the treatment of cancer, autoimmune disorders and infectious diseases; Hutchinson China MediTech Limited, a publicly traded innovative biopharmaceutical company which researches, develops, manufactures and sells pharmaceuticals and health care products; and, since February 2018, Unum Therapeutics Inc., a publicly traded clinical-stage biopharmaceutical company focused on the development and commercialization of novel immunotherapy products. Dr. Ferrante also served as a director of Baxalta Inc., a publicly traded global biopharmaceutical company until its acquisition by Shire Pharmaceuticals in June 2016. She holds a B.S. in Chemistry and Biology from Providence College and an M.D. from Georgetown University; she has also been an author of a number of papers in the oncology field, is an active participant in academic and professional associations and symposia, and holds several patents.

Dr. Ferrante's more than two decades' experience working with major biotechnology and pharmaceutical companies and leading their efforts in oncology research and development and clinical activities, together with her knowledge in our principal focus of operations, adds broad and significant insight into our developmental and clinical efforts for the perspective of our Board.

**Mr. Kishbauch**, 70, joined our Board in September 2013. He has held senior management positions in the life sciences industry for almost three decades, with extensive operational, strategic, product planning and promotion, sales, marketing and product launch experience. Mr. Kishbauch was most recently President and Chief Executive Officer of Achillion Pharmaceuticals, Inc., a publicly traded pharmaceutical company, in which capacities, as well as a director, he served from 2004 until his retirement in 2013. Before joining Achillion, Mr. Kishbauch founded in 1996 and served until 2004 as President and Chief Executive Officer of OraPharma, Inc., a publicly traded, commercial-stage pharmaceutical company focused on oral health care which was acquired by Johnson & Johnson in 2003. He previously held senior management positions with MedImmune, Inc. Mr. Kishbauch continues to serve on Achillion's board as a member of the Board, its Compliance Committee, and as a Chairman of its Strategy Committee. He also serves on the board of directors of Catabasis Pharmaceuticals, Inc., also a publicly traded biopharmaceutical company, where he is a member of the Audit Committee and the chair of the Compensation Committee. He was a director of ARIAD Pharmaceuticals, Inc. from 2004 to 2008 and has held board positions with several other life sciences companies. He holds an M.B.A. from the Wharton School of the University of Pennsylvania and a B.A. in biology from Wesleyan University.

Mr. Kishbauch's extensive experience as an entrepreneur and manager, as well as a public company senior executive, has provided him a uniquely comprehensive knowledge of and perspective on our industry and adds significant value to our Board.

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**Dr. Scheinberg**, 63, joined our Board in 1996. Since 1986, he has been associated with the Sloan-Kettering Institute for Cancer Research, where, since 2002, he has served as the Vincent Astor Chair and Member of the Leukemia Service; Chairman of the Molecular Pharmacology Program; and Chairman of the Experimental Therapeutics Center. He also holds the positions of Professor of Medicine (since 2002) and of Pharmacology (since 1999) at the Weill-Cornell Medical College of Cornell University, and is a Founder and Director of the Tri-Institutional Therapeutics Discovery Institute, a non-profit drug development corporation formed by Sloan-Kettering, Cornell and The Rockefeller University since 2013. Since January 2018, Dr. Scheinberg has been a director of SELLAS Life Sciences Group, Inc., a public biotechnology company. He received a B.A. from Cornell University and an M.D. and a Ph.D. in pharmacology and experimental therapeutics from The Johns Hopkins University School of Medicine.

Dr. Scheinberg's expertise as a leading academic oncologist at Sloan-Kettering and Cornell is exceptionally valuable to the Board and its Science and Strategy Committee, which he chairs. He evaluates potential research directions and the design and monitoring of resulting programs. His broad knowledge of and contacts in the highest levels of medical research are important to our efforts to advance our research and development initiatives.

**Ms. Williams**, 74, joined our Board in January 2007. In May 2006, she retired as Chief Financial Officer of Abraxis BioScience Inc., a biopharmaceutical company, and President of its Abraxis Pharmaceutical Products division, positions she assumed upon the April 2006 merger of American Pharmaceutical Partners, Inc. and American Bioscience Inc. From 2002 to 2006, Ms. Williams was the Executive Vice President and Chief Financial Officer of American Pharmaceutical Partners, Inc., as well as President from 2005 to 2006. Previously, she was Executive Vice President and Chief Financial Officer of R.P. Scherer Corp., a global drug delivery company. Ms. Williams is President of the Nicklin Capital Group, Inc., a firm she founded in 1999 to invest in and provide consulting to early-stage technology companies in the Midwest. She was a director and Audit Committee chair until November 2015 and a Compensation Committee member, at Intercept Pharmaceuticals, Inc., a publicly traded biotechnology company, and previously held the same positions, in addition to Nominating and Governance Committee chair, at Orchid Cellmark, Inc., a leading DNA identity testing service company, until its 2011 purchase by Laboratory Corporation of America Holdings. Ms. Williams received her Demi-Licence en Science Politique from the University of Geneva, Switzerland, her License en Science Politique from the Graduate Institute of International Affairs, University of Geneva, Switzerland and her M.B.A. from the Graduate School of Business, University of Chicago.

Ms. Williams' experience gives her special insight into the financial and operational issues that a company in the pharmaceutical industry faces. She brings expertise to us in the areas of financial analysis and reporting, internal auditing and controls, and risk management oversight. Her board and audit committee roles at other public companies give her a broad perspective in the areas of financial reporting, and audit and enterprise risk management ("ERM"). Her international training and experience with global corporations helps to guide us as our operations and activities have become more global.

**CORPORATE GOVERNANCE**

## Code of Business Ethics and Conduct

We have a Code of Business Ethics and Conduct (the “Code”) which is applicable to all of our directors, employees and consultants. The Code meets the criteria for a “code of ethics” under the SEC rules and “code of conduct” under the Nasdaq Marketplace rules. The Code is described in more detail under *Item 13. Certain Relationships and Related Transactions*, below, and is available on our website at [www.progenics.com](http://www.progenics.com). Waivers from, and amendments to, the Code that apply to our directors, executive officers or persons performing similar functions will be timely posted in the Investors—Corporate Governance section of our website at [www.progenics.com](http://www.progenics.com) to the extent required by applicable rules of the Securities and Exchange Commission or the Nasdaq Stock Market LLC.

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**Audit Committee**

We have a standing Audit Committee of the Board. The Audit Committee reviews our quarterly and annual financial statements and the reporting documents in which they are submitted to the SEC, consults with our independent auditors and examines and considers other matters relating to the audit of our financial statements and our financial condition and affairs generally, including the selection and retention of our independent auditors. It is responsible for oversight of our outsourced internal audit provider, which reports directly to it, oversees the work of management to identify, assess, and monitor risk, and liaises with management and the Board in risk mitigation efforts. The Audit Committee consists of Ms. Williams, Dr. Ferrante and Mr. Kishbauch. Ms. Williams, Chair of the Committee, is an “audit committee financial expert” as such term is defined in SEC rules and an “independent director” as such term is defined in Nasdaq Marketplace rules. See *Director Independence* under *Item 13. Certain Relationships and Related Transactions* for information about the independence of each of the other members of the Audit Committee.

**Section 16(a) Beneficial Ownership Reporting Compliance**

Based solely on our review of the reports under Section 16(a) of the Exchange Act and representations furnished to us with respect to the last fiscal year, we believe that each of the persons required to file such reports timely complied with all applicable filing requirements during 2018. We continue to monitor the effectiveness of our policies and procedures designed to ensure compliance with Section 16 reporting requirements.

**Item 11. Executive Compensation**

**Compensation Discussion and Analysis (“CD&A”)**

We are an oncology company focused on the development and commercialization of innovative targeted medicines and artificial intelligence to find, fight and follow cancer. Our pipeline includes therapeutic agents designed to precisely target cancer (1095 and PSMA TTC), as well as a prostate-specific membrane antigen (“PSMA”) targeted imaging agent for prostate cancer (PyL™). We compete with biopharmaceutical companies of all sizes to attract employees with the skills and expertise necessary to develop and commercialize drugs and achieve our objectives. Since the funds we can use for compensation are limited, we have worked to develop a compensation program that allows us to attract and retain talented individuals with the essential experience and skills we need at the executive level while being mindful of our limited resources. Our program combines base salary with an annual bonus opportunity and long-term equity incentives, primarily in the form of stock options. We strive to conserve cash resources by setting base salaries and total cash compensation at what we deem an appropriate level in view of market compensation data in our industry and other factors as discussed below, while providing meaningful long-term equity opportunities for our executives.

This CD&A outlines, among other things, our compensation philosophy, objectives and processes as they relate to the following executive officers named below in the *Summary Compensation Table* (our “NEOs”) in 2018: Mark R. Baker, our CEO; Patrick Fabbio, our Chief Financial Officer (“CFO”); Benedict Osorio, our COO; Bryce Tenbarge, our Senior Vice President, Commercial; and Vivien Wong, our Executive Vice President, Development.

**Overview.** We believe that the total compensation awarded to our NEOs for 2018 appropriately reflects the performance of the executive and the Company and is consistent with our compensation philosophy. We made significant progress in achieving strategic objectives and program development in 2018. During 2018, RELISTOR<sup>®</sup> (methylnaltrexone bromide) annual net sales totaled \$99.4 million (as reported by our partner, Bausch Health Companies Inc. (“Bausch”, which is the predecessor of Valeant Pharmaceuticals International, Inc.)).

In December 2018, we entered into an exclusive license agreement with Curium, the largest global nuclear medicine company formed through the union of Mallinckrodt and IBA Molecular, to develop, manufacture and commercialize PyL in Europe. Under the terms of the collaboration, Curium will be responsible for the development, regulatory approvals and commercialization of PyL in Europe while we are entitled to royalties on net sales. We understand from Curium that Curium plans to meet with European regulators in 2019 to agree upon the regulatory path forward for PyL in the territory.

In December 2018, we announced the first patient was dosed in the Phase 3 CONDOR trial evaluating the diagnostic performance and clinical impact of PyL, the Company’s PSMA-targeted small molecule PET/CT imaging agent designed to visualize prostate cancer. The Phase 3 CONDOR trial is a multi-center, open label trial that will enroll approximately 200 male patients with biochemical recurrence of prostate cancer in 14 sites in the United States and Canada. The Company expects to complete enrollment in the fourth quarter of 2019 and report data in early 2020.

On September 12, 2018, we announced top line data from our Phase 3 study of 1404, our PSMA-targeted small molecule SPECT/CT imaging agent that is designed to visualize prostate cancer. After review of the results of its Phase 3 study of 1404 and an assessment of the PSMA-targeted imaging agent commercial landscape, we decided to focus our efforts on PyL, a PSMA-targeted PET/CT imaging agent, and not further invest in 1404.



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On July 30, 2018, the U.S. Food and Drug Administration (“FDA”) approved the New Drug Application (“NDA”) for AZEDRA (iobenguane I 131) 555 MBq/mL injection for intravenous use. AZEDRA, which is a registered trademark, is a radiotherapeutic that is indicated for the treatment of adult and pediatric patients 12 years and older with iobenguane scan positive, unresectable, locally advanced or metastatic pheochromocytoma or paraganglioma who require systemic anticancer therapy. AZEDRA is the first and only FDA-approved therapy for this indication. AZEDRA’s approved U.S. label and full U.S. prescribing information is available at [www.AZEDRA.com](http://www.AZEDRA.com).

At the same time, we continued our focus on cost control and maintaining a sustainable cash burn rate and strong balance sheet.

We believe our program strongly links executive compensation with our performance. We have adopted a formal annual incentive plan based on metrics established by the Compensation Committee to provide a framework to determine annual bonus payments to NEOs and other key employees. As part of that process, we establish annual goals and objectives for the Company, and, as discussed below, determine bonuses based on how well we performed against these goals and objectives as determined by the Compensation Committee. For NEOs other than Mr. Baker, the annual bonus is also based on the Compensation Committee’s assessment of the executive’s individual performance during the year. We believe the annual bonus plan helps contribute to our growth and the creation of value for our stockholders.

A significant percentage of our NEOs’ compensation is provided in the form of stock options that we believe further align their interests with those of our stockholders. The options we grant to our NEOs have an exercise price equal to the closing price of our common stock on the date of grant and will therefore have value only if our stock price increases. The options vest over a multi-year period to provide an additional retention incentive for our executives.

**Executive Compensation Objectives.** We seek to achieve the following broad goals in our executive compensation programs and decisions regarding individual compensation:

- Attract and retain executives critical to our overall success.
- Reward executives for contributions to achieving strategic goals that enhance stockholder value.
- Foster and maintain a company culture of ownership, creativity and innovation.
- Motivate our NEOs to achieve critical long- and short-term development, product and financial milestones set by the Board in consultation with management.

**General Compensation Process.** The Compensation Committee is responsible for determining the elements and levels of compensation for our NEOs. In doing so, it reviews our corporate performance against financial and corporate achievement measures, assesses individual performance and evaluates recommendations of the CEO regarding compensation for other NEOs.

The process the Compensation Committee followed in assessing the NEOs' and the Company's performance for 2018 began, as has been the Compensation Committee's practice in the past, with meetings in early 2018 that were principally focused on approving bonuses relating to 2017 performance and establishing 2018 salary, target bonus and equity grant levels. In those meetings, Mr. Baker was invited to make an oral presentation and submit to the Compensation Committee written materials regarding the performance of the NEOs and other officers, his views regarding the performance of the Company, and his assessment of his own performance. Mr. Baker neither participated in nor was present for decisions regarding his own compensation.

To assist in its deliberations regarding executive compensation for 2018, the Compensation Committee directly engaged Frederic W. Cook & Co. ("FW Cook") as its compensation consultant. FW Cook does not undertake any work for us other than its services for the Compensation Committee. The Compensation Committee has determined that FW Cook is independent and that its services do not raise any conflict of interest with us or any of our executive officers or directors. In carrying out its work for the Compensation Committee, FW Cook interacts from time to time directly with our management, as it determines appropriate, regarding its work product prior to presentation to the Compensation Committee in order to confirm alignment with our business strategy and obtain data or information necessary for its work.

FW Cook reviewed and discussed with the Compensation Committee competitive market compensation data for consideration when determining different levels and mix of compensation for 2018. The Compensation Committee reviewed publicly available compensation information of executive officers of a peer group of companies within the biotechnology industry, selected by the Compensation Committee with FW Cook's assistance, that were similar to the Company in size, business model and state of development. In selecting the peer group, we typically focus on companies with one-year average market capitalization of 0.2 to 5 times our one-year average market capitalization, total employees of 0.5 to 2 times our total employees and three-year average revenues of 0.4 to 2.5 times our three-year average revenue. We use averages for revenues and market capitalization because of the high volatility of these metrics at early-stage life sciences companies. We may also make exceptions to these parameters in certain cases as the Compensation Committee determines appropriate.

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For 2018, the peer group companies consisted of the following companies:

Agenus Inc.	MacroGenics, Inc.
Array Biopharma Inc.	OncoMed Pharmaceuticals, Inc.
BioCryst Pharmaceuticals, Inc.	Rigel Pharmaceuticals, Inc.
BioDelivery Sciences International, Inc.	Sucampo Pharmaceuticals, Inc.
CTI BioPharma Corp.	Vanda Pharmaceuticals, Inc.
Curis, Inc.	Xencor, Inc.
GTx Inc.	XOMA Corporation
Immunomedics Inc.	

The peer company compensation data provided by FW Cook is used by the Compensation Committee as a general reference point in its compensation review. The Compensation Committee does not set compensation levels at any specific level or percentile against this compensation data (*i.e.*, the Compensation Committee does not “benchmark” our executive compensation levels). The peer group data is only one point of information taken into account by the Compensation Committee in making compensation decisions as noted below.

In addition to Mr. Baker’s recommendations regarding the other NEOs and its review of market data, the Compensation Committee considered various other factors in setting the NEOs’ 2018 target compensation opportunities such as the individual’s corporate roles and responsibilities, particular experience and expertise, performance and specific duties, the scope of his or her position and the department(s) or group(s) for which he or she had responsibility, our overall corporate financial performance and the progress of our research and development programs and strategic initiatives during the year. The Compensation Committee does not assign any particular weighting to any factor and has discretion to consider whatever factors it may deem relevant to a particular decision. Except as otherwise noted in this *Compensation Discussion and Analysis*, decisions by the Compensation Committee are subjective and the result of the Compensation Committee’s business judgment, which is informed by the experiences of the members of the Compensation Committee as well as analysis and input from, and comparable peer data provided by, the Compensation Committee’s independent compensation consultants.

**Elements of Compensation.** We utilize a compensation structure that primarily includes base salary, an annual bonus opportunity and long-term incentives. These elements are designed to reward (i) core competence demonstrated in light of the executive’s duties and responsibilities (base salary), (ii) decision-making that supports our annual product, development and financial goals (annual bonus), and (iii) a focus on building shareholder value over the long term in a sustainable manner by making decisions that will not sacrifice long-term prospects for a particular short-term achievement or goal (long-term incentives).

**Base Salary.** In setting levels of base salary for our executives, the Compensation Committee generally takes into account the individual’s role and responsibilities, experience, expertise, individual performance and tenure. The Compensation Committee’s view is that the NEO’s base salaries should generally be set around the median level for the

executive's position relative to the peer data provided by the Compensation Committee's consultant.

The Compensation Committee approved the following base salary levels for the NEOs for 2018, in each case representing an increase of 3.0% over the executive's 2017 base salary, except that Mr. Tenbarge received an increase of 13% in light of his promotion to Senior Vice President, Commercial in March 2018: Mr. Baker \$632,755; Mr. Fabbio \$386,550; Mr. Tenbarge \$380,000; and Dr. Wong \$419,683. Mr. Osorio was rehired in February 2018 and his starting base salary was set at \$355,000. The Compensation Committee determined in its judgment that each of these 2018 salary levels was appropriate, taking into account the peer company data provided by FW Cook and in light of the executive's tenure in his or her position and the other factors noted above.

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**Annual Bonus.** Beginning in the fourth quarter of each year, the Compensation Committee works collaboratively with senior management to develop corporate goals and objectives for the annual bonus plan that are tied to strategic plans for the coming year. For 2018, the Compensation Committee established three corporate strategic and research and development goals, one commercial goal, and one financial goal to measure the Company's performance during the year. The table below reflects the weightings for each goal and the achievement scores awarded by the Compensation Committee at the end of the fiscal year in determining the NEOs' annual cash bonuses:

Performance Metric	Weight	Compensation	Score
		Committee Assessment	Awarded
Maximize value of AZEDRA	35%	80% (partially met)	28%
Increase value of pipeline	25%	100%	25%
Business development adds to the Company's pipeline	25%	75% (partially met)	19%
Finance manages expenses and financing	15%	125% (exceeded)	19%
<b>Total</b>	<b>100%</b>		<b>91%</b>

Target bonus amounts were established for each executive based on a percentage of the executive's base salary and are generally set at levels the Compensation Committee believes to be competitive. For 2018, Mr. Baker's bonus target was 50% of his base salary, and his bonus opportunity was based entirely on achievement of the corporate goals listed above. The target bonus amounts for the other NEOs were set by the Compensation Committee in its judgment, taking into account Mr. Baker's recommendations, and are presented in a table below. For each NEO other than Mr. Baker, the target bonus amount was 35% of the executive's base salary and the bonus opportunity was allocated 75% and 25% to the achievement of corporate goals and the NEO's individual performance, respectively. For Mr. Osorio, the bonus amount was prorated from his 2018 start date. In each case, the Compensation Committee caps the achievement percentage for each goal at 150% of target, which effectively caps annual incentive bonus payments at 150% of the target award amount regardless of how many goals are met or exceeded. Bonuses are generally paid in the first quarter of the following year.

The actual bonus amounts for the NEOs are determined by the Compensation Committee based on its assessment of achievement of the corporate goals identified above and, for each NEO other than Mr. Baker, the individual NEO's performance during the year (taking into account the recommendations of Mr. Baker with respect to the individual performance of the NEOs other than himself). As noted above, the Compensation Committee approved an achievement percentage of 91% for the corporate goals. Consistent with its decision over the last few years, the Compensation Committee did not establish individual goals for the NEOs. Instead, Mr. Baker reviewed with the Compensation Committee the individual performance of each NEO and the NEO's role in achieve the corporate goals. The Compensation Committee determined in reviewing the performance of the management team it would be appropriate to award each NEO an individual performance factor between 115% and 125% as specified below.

For the individual NEOs, the Compensation Committee awarded annual incentive bonus payments as follows:

NEO	2018 Salary	2018 Bonus	2018 Bonus	Corporate Weighting x		Individual Weighting x		% of Bonus Target	2018 Bonus Awarded
		Target as % of Salary		Target	Corporate Score	Individual Score	Awarded		
Mark R. Baker	\$ 632,755	50%	\$ 316,377	100%	x 91%	0%	x N/A	91.0%	\$ 287,904
Patrick Fabbio	\$ 386,550	35%	\$ 135,293	75%	x 91%	25%	x 125%	99.5%	\$ 134,616
Benedict Osorio <sup>(1)</sup>	\$ 355,000	35%	\$ 124,250	75%	x 91%	25%	x 125%	99.5%	\$ 106,321
Bryce Tenbarge	\$ 380,000	35%	\$ 133,000	75%	x 91%	25%	x 125%	99.5%	\$ 132,335
Vivien Wong	\$ 419,683	35%	\$ 146,889	75%	x 91%	25%	x 115%	97.0%	\$ 142,482

<sup>(1)</sup> Mr. Osorio's Bonus amount was prorated to reflect the period of his employment during 2018.

The Compensation Committee may also award discretionary bonuses from time to time as it deems appropriate. In January 2018, the Compensation Committee approved a bonus of \$80,000 for Mr. Osorio in connection with his rejoining the Company. Mr. Osorio is obligated to repay his bonus to the Company in case of his voluntary termination of employment within one year of his start date.

**Long-Term Incentives.** For 2018, as we have done in prior years, we granted long-term incentives to the NEOs in the form of stock options under our 2005 Stock Incentive Plan (the "2005 Plan"). The exercise prices of these options were set at the closing price of our common stock on the grant date, so the options will only have value if our stock price increases after the grant date, further aligning the interests of our executives with those of our stockholders. The options vest generally in equal annual installments over three years from the date of grant subject to the executive's continued employment through the vesting date, although the Compensation Committee may establish different vesting requirements as it deems appropriate for a particular award (for example, in connection with a new-hire or promotion grant). The Compensation Committee believes that stock options provide appropriate incentives for executives both to increase value on a long-term basis for our stockholders and to continue in service with us.

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When determining the grant levels of long-term incentive awards to our NEOs, the Compensation Committee compares (i) the value of the grant with the value of comparable grants made to executive officers in our peer group as discussed above; (ii) the number of shares granted by position as a percentage of our total common shares outstanding, compared with the applicable percentages of comparable grants made to executives in our peer group; and (iii) the executive's overall equity incentive opportunity, compared with the applicable overall equity incentive for executives in our peer group. The Compensation Committee believes these comparisons provide a meaningful context for assessing the competitive level of our equity grants and help ensure that we are not at a competitive disadvantage in terms of hiring or retaining key executive talent. As noted above, the Compensation Committee determines the levels of equity grants and other compensation in its judgment, uses the peer group information as background reference only and does not benchmark equity awards at any particular level relative to the peer group.

In March 2018, the Compensation Committee approved grants of stock options to each of the NEOs. Based on the number of shares subject to each NEO's grant (other than Mr. Osorio), these grants were slightly higher than the grant levels awarded to these executives for 2017. As Mr. Osorio had rejoined the Company in February 2018, the Compensation Committee approved a new grant to him of 100,000 options that will vest over a five-year period. More information on the options granted to our NEOs during 2018 and awards outstanding from prior grants are presented in the *Grants of Plan-Based Awards in 2018* and *Outstanding Equity Awards at Fiscal Year-End* tables, below.

We generally grant annual equity awards near the beginning of the year (typically in March) to coincide with other compensation decisions. We may also grant awards to newly-hired employees or at other times during the year as deemed appropriate by the Compensation Committee.

**Retirement, Welfare Benefits.** We make available to our NEOs retirement and welfare benefits, consisting of participation in, and partial matching contributions by us to, our 401(k) retirement plan and access to medical, dental, and other welfare plans, all of which are available to all full-time employees. NEOs also receive reimbursement of premiums for enhanced life and disability insurance, totaling less than \$10,000 per NEO, and we generally do not provide material perquisites to our NEOs. This approach is consistent with our view that company resources are generally best utilized in research, development and commercialization efforts. The total of these benefits in 2018 for each NEO is presented in the *Summary Compensation Table*, below.

**Severance Benefits; No Tax Gross-Ups.** We do not have employment or other severance agreements with any of our NEOs, although we do provide accelerated vesting of equity awards if an NEO is terminated by the Company without cause in connection with a change in control. We do not provide any of our executives with reimbursements or "gross-up" payments for any taxes incurred pursuant to Section 280G of the Internal Revenue Code of 1986, as amended (the "IRC") or otherwise.

**Compensation and Risk.** We do not believe, given the nature of our activities and the manner in which our employees are compensated, that risks arising from our compensation policies and practices relating to all of our employees are

reasonably likely to have a material adverse effect on us. As described above, the Compensation Committee establishes multiple performance goals for the annual incentive plan and believes that this structure mitigates the risk associated with overemphasis on a particular performance metric. In its assessment of the achievement of these annual performance goals, the Compensation Committee caps the annual incentive bonus payments at 150% of the target award amount regardless of how many goals are met or exceeded. A significant portion of our NEOs' compensation is in the form of equity-based awards that are intended to further align the interests of our executives with those of our stockholders and provide additional incentives to focus on the long-term success of our company.

***Tax Considerations.*** Federal income tax law generally prohibits a publicly-held company from deducting compensation paid to a current or former named executive officer that exceeds \$1 million during the tax year. Certain awards granted before November 2, 2017 that were based upon attaining pre-established performance measures that were set by the Compensation Committee under a plan approved by the Company's stockholders, as well as amounts payable to former executives pursuant to a written binding contract that was in effect on November 2, 2017, may qualify for an exception to the \$1 million deductibility limit. As one of the factors in its consideration of compensation matters, the Compensation Committee notes this deductibility limitation. However, the Compensation Committee has the flexibility to take any compensation-related actions that it determines are in the best interests of the Company and our stockholders, including awarding compensation that may not be deductible for tax purposes. There can be no assurance that any compensation will in fact be deductible.



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**Stockholder Advisory Vote on Executive Compensation.** We provide our stockholders with the opportunity to cast an annual advisory vote to approve our executive compensation program (referred to as a “say-on-pay proposal”). At our annual meeting of stockholders held in June 2018, approximately 98.3% of the votes actually cast on the say-on-pay proposal were voted in favor of the proposal. The Compensation Committee believes these strong results affirm stockholders’ support of our approach to our executive compensation program. In general, the Compensation Committee did not change its approach in 2018 and believes the program in place reflects the goals of our program and best practices in the market. The Compensation Committee will continue to consider the outcome of our say-on-pay proposals when making future compensation decisions for the NEOs.

**Compensation Committee Report**

The Compensation Committee has submitted the following report for inclusion in this Amendment:

The Compensation Committee has reviewed and discussed the Compensation Discussion and Analysis contained in this Amendment with management. Based on the Compensation Committee’s review of and the discussions with management with respect to the Compensation Discussion and Analysis, the Compensation Committee recommended to the Board that the Compensation Discussion and Analysis be included in this Annual Report on Form 10-K.

By the Compensation Committee of the Board of Directors,

Peter J. Crowley, Chair

Michael D. Kishbauch

**Summary Compensation Table – 2016 – 2018**

The table and footnotes below describe the total compensation paid to our NEOs for the years 2018, 2017, and 2016 as identified in the table below. As reflected in the table and discussed above in the CD&A, we compensate these executive officers primarily with a combination of cash and stock options, the latter of which is presented in this table in dollar values (see note 1 and the equity compensation tables that follow). We did not issue any other types of equity awards (such as restricted stock or stock unit awards) in 2018.

Name and Principal Position	Year	Salary	Bonus (1)	Option Awards (2)	Non-Equity	All Other	Total
					Incentive Plan Compensation (1)	Compensation (3)	
Mark R. Baker <i>Chief Executive Officer</i>	2018	\$632,755	\$-	\$928,058	\$ 287,904	\$ 18,693	\$1,867,410
	2017	\$614,325	\$-	\$1,373,141	\$ 307,163	\$ 18,507	\$2,313,136
	2016	\$593,551	\$53,224	\$556,774	\$ 296,776	\$ 19,093	\$1,519,418
Patrick Fabbio (4) <i>Executive Vice President and Chief Financial Officer</i>	2018	\$386,550	\$-	\$437,513	\$ 134,616	\$ 15,472	\$974,151
	2017	\$375,291	\$-	\$647,338	\$ 131,352	\$ 15,185	\$1,169,166
	2016	\$362,600	\$-	\$262,479	\$ 134,842	\$ 11,629	\$771,550
Benedict Osorio (5) <i>Chief Operating Officer</i>	2018	\$305,391	\$80,000	\$461,147	\$ 106,321	\$ 14,555	\$967,414
Bryce Tenbarge <i>Senior Vice President, Commercial</i>	2018	\$374,972	\$-	\$350,011	\$ 132,335	\$ 11,746	\$869,063
	2017	\$336,375	\$-	\$517,870	\$ 109,339	\$ 11,436	\$975,020
	2016	\$118,333	\$-	\$346,852	\$ 52,821	\$ 691	\$518,697
Vivien Wong <i>Executive Vice President, Development</i>	2018	\$419,683	\$-	\$437,513	\$ 142,482	\$ 18,045	\$1,017,723
	2017	\$407,459	\$-	\$647,338	\$ 151,524	\$ 17,971	\$1,224,292
	2016	\$390,152	\$-	\$262,479	\$ 146,400	\$ 18,578	\$817,609

(1) The amounts reported in the “Non-Equity Incentive Plan Compensation” column represent cash bonuses awarded under our annual incentive plan, while the amounts in the “Bonus” column represent discretionary bonuses awarded to certain NEOs during the applicable fiscal year. Each of the NEOs’ 2018 bonuses is described in the *Compensation Discussion and Analysis* above.

(2) The amounts reported in this column for each NEO reflect the aggregate grant date fair value of stock options granted to the NEO during the applicable fiscal year. The fair values were determined based on the assumptions for calculating expense amounts as set forth in the notes to our consolidated financial statements included in our Annual Report on Form 10-K for the relevant years (For 2018 grants, see Note 11 – Stock-Based Compensation, in our 2018 Annual Report, filed with the SEC on March 15, 2019). Additional information on the 2018 awards is included in the *Grants of Plan-Based Awards for 2018* and *Outstanding Equity Awards at 2018 Fiscal Year-End* tables, below.

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The amounts reported in this column for 2018 for each NEO include our matching contribution under our 401(k) Plan in the amount of \$12,250 for Mr. Baker, \$12,250 for Mr. Fabbio, \$8,875 for Mr. Osorio, \$9,250 for Mr. (3) Tenbarga, and \$11,450 for Dr. Wong. This column also includes payments of premiums for enhanced life and disability insurance for Mr. Baker (\$6,443), Mr. Fabbio (\$3,222), Mr. Osorio (\$5,680), Mr. Tenbarga (\$2,496), and Dr. Wong (\$6,595).

(4) Mr. Fabbio was promoted from Senior Vice President to Executive Vice President on March 1, 2019.

(5) Mr. Osorio joined us as Senior Vice President, Quality in February 2018 and was promoted to COO on March 1, 2019.

## **Employment Letters**

In connection with his appointment as Senior Vice President and CFO in November 2015, we entered into an offer letter with Mr. Fabbio. The letter provides for a starting annual base salary of \$350,000 and eligibility to participate in our annual cash incentive plan, with a target bonus opportunity equal to 35% of base salary. Mr. Fabbio was promoted to Executive Vice President and CFO on March 1, 2019. The Compensation Committee increased Mr. Fabbio's base salary most recently to \$427,012 per year for 2019. The letter includes certain non-competition, non-solicitation, and other restrictive covenants in our favor.

In connection with his appointment as Vice President, Commercial in August 2016, we entered into an offer letter with Mr. Tenbarga. The letter provides for a starting annual base salary of \$325,000 and eligibility to participate in our annual cash incentive plan, with a target bonus opportunity equal to 30% of base salary. Mr. Tenbarga was promoted to Senior Vice President, Commercial on March 1, 2018. The Compensation Committee increased Mr. Tenbarga's base salary most recently to \$395,200 per year for 2019. The letter includes certain non-competition, non-solicitation, and other restrictive covenants in our favor.

In connection with his appointment as Senior Vice President, Quality in February 2018, we entered into an offer letter with Mr. Osorio. The letter provides for a starting annual base salary of \$355,000, sign on bonus of \$80,000 and eligibility to participate in our annual cash incentive plan, with a target bonus opportunity equal to 35% of base salary. Mr. Osorio was promoted to COO on March 1, 2019. The Compensation Committee approved Mr. Osorio's promotion to COO and increased his base salary most recently to \$394,200 per year for 2019. The letter includes certain non-competition, non-solicitation, and other restrictive covenants in our favor.

## **Grants of Plan-Based Awards in 2018**

The following table sets forth information regarding grants of incentive compensation awards we made to our NEOs during 2018.

Name	Grant Date	Estimated Future Payouts Under Non-Equity Incentive Plan Awards <sup>(1)</sup>		All Other Option Awards: Number of Securities Underlying Options (#) <sup>(2)</sup>	Exercise or Base Price of Option Awards (\$/Share)	Grant Date Fair Value of Stock and Option Awards <sup>(3)</sup>	
		Through	Maximum				
Mr. Baker	3/1/2018 N/A	-	\$316,377	\$474,566	201,250	\$ 6.62	\$ 928,058
Mr. Fabbio	3/1/2018 N/A	-	\$135,293	\$202,939	94,875	\$ 6.62	\$ 437,513
Mr. Osorio	3/1/2018 N/A	-	\$124,250	\$186,375	100,000	\$ 6.62	\$ 461,147
Mr. Tenbarge	3/1/2018 N/A	-	\$133,000	\$199,500	75,900	\$ 6.62	\$ 350,011
Dr. Wong	3/1/2018 N/A	-	\$146,889	\$220,334	94,875	\$ 6.62	\$ 437,513

<sup>(1)</sup> These columns reflect opportunities to receive a bonus under our annual incentive plan for 2018. The terms of the plan are described in the *Annual Bonus* discussion under *Compensation Discussion and Analysis*, above.

<sup>(2)</sup> These option grants vest in equal annual installments over the three-year period beginning March 1, 2018 (except that Mr. Osorio's grant vests over five years). In each case, vesting is contingent on the executive's continued employment through the vesting date.

<sup>(3)</sup> These amounts reflect the aggregate grant date fair value of the award determined based on the assumptions described in note 1 to the *Summary Compensation Table* above.

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Each of the stock option awards reported in the table above was granted under our 2005 Plan. The 2005 Plan is administered by the Compensation Committee, which has authority to interpret the plan provisions and make all required determinations. Plan awards are generally only transferable to a beneficiary of an awardee upon his or her death or, in certain cases, to family members for tax or estate planning purposes. If there is a Change of Control of the Company, the Compensation Committee may provide for the treatment of outstanding awards upon the transaction, including acceleration of vesting, elimination, or modification of performance or other conditions, extension of time to exercise or realize gain, acceleration of payment or cash settlement. The Compensation Committee has determined that all outstanding stock incentive awards held by a Company employee will vest in full if the employee is Terminated without Cause during the one-year period following a Change of Control (as such terms are defined in the 2005 Plan and our form of stock incentive award agreement).

**Outstanding Equity Awards at 2018 Fiscal Year-End**

The table below sets forth information regarding unexercised stock options held by our NEOs as of December 31, 2018. None of our NEOs held any unvested restricted stock or stock unit awards at December 31, 2018.

Name	Option Awards		Equity Incentive Plan			Option Expiration Date
	No. of Securities		Awards: No. of Securities Underlying			
	Unexercised	Unexercised	Unexercised	Unearned	Exercise Price	
	Options (#)	Options (#)	Options (#)	Options (#)		
Mr. Baker	-	201,250	(1)	-	\$ 6.62	3/1/2028
	58,333	116,667	(2)	-	\$ 11.32	3/1/2027
	116,666	58,334	(3)	-	\$ 4.52	3/1/2026
	132,000	-		-	\$ 6.65	3/2/2025
	132,000	-		-	\$ 4.70	3/3/2024
	120,000	-		-	\$ 5.03	4/3/2023
	66,666	-		-	\$ 9.81	3/1/2022
	62,500	-		-	\$ 7.40	7/1/2021
	46,875	-		-	\$ 7.40	7/1/2021
	200,000	-		-	\$ 7.66	6/8/2021
125,000	-		-	\$ 5.35	7/1/2020	
150,000	-		-	\$ 5.35	7/1/2020	

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Mr. Fabbio	-	94,875	(1)	-	\$ 6.62	3/1/2028
	27,500	55,000	(2)	-	\$ 11.32	3/1/2027
	55,000	27,500	(3)	-	\$ 4.52	3/1/2026
	75,000	50,000	(4)	-	\$ 6.77	12/1/2025
Mr. Osorio	-	100,000	(6)	-	\$ 6.62	3/1/2028
Mr. Tenbarga	-	75,900	(1)	-	\$ 6.62	3/1/2028
	22,000	44,000	(2)	-	\$ 11.32	3/1/2027
	30,000	45,000	(5)	-	\$ 6.77	10/3/2026
Dr. Wong	-	94,875	(1)	-	\$ 6.62	3/1/2028
	27,500	55,000	(2)	-	\$ 11.32	3/1/2027
	55,000	27,500	(3)	-	\$ 4.52	3/1/2026
	66,000	-	-	-	\$ 6.65	3/2/2025
	52,800	-	-	-	\$ 4.70	3/3/2024
	75,000	-	-	-	\$ 4.70	3/3/2024
	48,000	-	-	-	\$ 5.03	4/4/2023
	40,000	-	-	-	\$ 9.81	3/1/2022
	60,000	-	-	-	\$ 7.40	7/1/2021
	25,000	-	-	-	\$ 4.83	11/1/2020
	6,000	-	-	-	\$ 5.35	7/1/2020
	3,375	-	-	-	\$ 5.33	7/1/2019

(1) These options vest in three annual installments measured from March 1, 2018.

(2) These options vest in three annual installments measured from March 1, 2017.

(3) These options vest in three annual installments measured from March 1, 2016.

(4) These options vest in five annual installments measured from December 1, 2015.

(5) These options vest in five annual installments measured from October 3, 2016.

(6) These options vest in five annual installments measured from March 1, 2018.

Table of Contents**Option Exercises and Stock Vested in 2018**

None of our NEOs exercised any stock options or held any restricted stock or other stock awards during 2018.

**Potential Payments upon Termination or Change in Control**

We have no employment or other agreements with any of our NEOs that provide for severance benefits. As a result, the only benefits which the NEOs who are currently employed by us would be entitled to receive upon termination of employment or a change in control of the Company would be accelerated vesting of their equity awards if the executive is terminated by the Company without cause during the one-year period following a change in control, as provided in the applicable award agreements. As of December 31, 2018, the exercise price of each executive's then-outstanding and unvested stock options was greater than the closing price on that date of \$4.20.

As noted above, we do not provide reimbursement or gross-up payments to NEOs for parachute payment taxes incurred in connection with a change in control.

**Director Compensation - 2018**

The following table sets forth information regarding the aggregate compensation we paid for 2018 to the members of our Board who are not employed by us or any of our subsidiaries ("non-employee directors"). Mr. Baker did not receive any additional compensation for services provided as a Board member during 2018 and continues to serve as a director without compensation for such services.

Name	Fees Earned or		All Other	Total (\$)
	Paid in Cash	Option Awards <sup>(1)</sup>		
Mr. Crowley	\$ 107,000	\$ 345,750	\$ -	\$452,750
Mr. Campbell	68,000	157,159	-	225,159
Dr. Ferrante	65,000	157,159	-	222,159
Mr. Kishbauch	80,000	157,159	-	237,159
Dr. Scheinberg	80,000	157,159	-	237,159
Ms. Williams	85,000	157,159	-	242,159

At December 31, 2018, the aggregate number of stock options outstanding for each of our non-employee directors was as follows: Mr. Campbell, 85,000; Mr. Crowley, 485,000; Dr. Ferrante, 145,000; Mr. Kishbauch, 160,342; Dr. Scheinberg, 165,000; and Ms. Williams, 165,000. Each non-employee director was granted a fully-vested option with respect to 25,000 shares of our common stock on the date of our 2018 annual meeting (except that the (1) Chair option grant for Mr. Crowley covered 55,000 shares). The grant date fair value of each of these options was \$157,159 (or \$345,750 in the case of Mr. Crowley's grant). In each case, the grant date fair values of the options granted to our non-employee directors are determined based on the assumptions described in Note 2 to the Summary Compensation Table for NEOs.

For Board and committee service under our director compensation policy our non-employee directors are entitled to receive:

a \$45,000 annual retainer for Board service (\$75,000 for service as Chair), an annual retainer fee for committee service as (i) Audit Committee member (\$10,000) or Chair (\$35,000; currently Ms. Williams); (ii) Compensation Committee member (\$7,000) or Chair (\$22,000; currently Mr. Crowley); (iii) Nominating and Corporate Governance Committee member (\$5,000) or Chair (\$13,000; currently Mr. Kishbauch); (iv) Science Committee member (\$10,000) or Chair (\$35,000; currently Dr. Scheinberg); and (v) Compliance Committee member (\$5,000) or Chair (\$13,000; currently Mr. Campbell); and

a fully-vested option for 25,000 common shares (55,000 in the case of the Chair) and, for newly-appointed directors joining the Board, a one-time option for 40,000 common shares vesting over five years.

Option awards for Board service are granted under the 2005 Plan (or any successor plan thereto). These options each have a ten-year term and have an exercise price equal to the closing price of our stock on the grant date.



Table of Contents**Pay Ratio Disclosure**

In accordance with Item 402(u) of Regulation S-K, promulgated by the SEC pursuant to the Dodd-Frank Wall Street Reform Act and Consumer Protection Act of 2010, we are required to disclose the ratio of the annual total compensation of Mr. Baker, our CEO, relative to the median annual total compensation of all of our employees (excluding our CEO).

**Based on SEC rules for this disclosure and the methodology described below, for 2018, the ratio of the annual total compensation of our CEO to the median of the annual total compensation of all employees was 11 to 1.**

**Employee Population.** We selected December 31, 2018, which is a date within the last three months of fiscal 2018, as the date we would use to identify our median employee. As of December 31, 2018, our global employee population consisted of 79 full-time employees at Progenics and its consolidated subsidiaries. This includes 67 U.S. employees.

**Methodology.** In determining the median employee, a list of all employees, exclusive of our CEO, Mr. Baker, was prepared based on all active employees included in our payroll records as of December 31, 2018. We used base compensation as the measure to identify the median employee from this list. Salaries and wages were annualized for those employees who were employed by us on December 31, 2018 but were not employed for the full year of 2018.

**Pay-Ratio Calculation.** The total annual compensation of the median employee was then calculated in the same manner as the total compensation disclosed for Mr. Baker in the *Summary Compensation Table* shown above.

Annual total compensation of Mr. Baker , CEO	\$	1,867,410
Annual total compensation of the median employee		177,233
Ratio of CEO to median employee compensation:	11:	1

This pay ratio is an estimate calculated in a manner consistent with SEC rules based on the methodology described above. The SEC rules for identifying the median compensated employee and calculating the pay ratio based on that employee's annual total compensation allow companies to adopt a variety of methodologies, to apply certain exclusions, and to make reasonable estimates and assumptions. As such, the pay ratio reported by other companies may not be comparable to the pay ratio reported above, as other companies may have different employment and compensation practices and may utilize different methodologies, exclusions, estimates, and assumptions in calculating their own pay ratios.

**Compensation Committee Interlocks and Insider Participation.** Messrs. Crowley and Kishbauch were the sole members of the Compensation Committee during all of 2018. No member of the Compensation Committee is or has been an executive officer of the Company or had any relationships requiring disclosure by us under rules of the SEC requiring disclosure of certain relationships and related person transactions. None of our executive officers currently serves, or in the past fiscal year has served, as a member of the board of directors or compensation committee of any entity that has one or more executive officers serving on our Board or its Compensation Committee.

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

The following table sets forth certain information as of April 15, 2019, except as noted, regarding the beneficial ownership of the common stock by (i) each person or group known to us to be the beneficial owner of more than 5% of our common stock outstanding, (ii) each of our directors and named executive officers, and (iii) all of our directors and executive officers as a group.

Name and Address of Beneficial Owner <sup>(1)</sup>	Shares Beneficially Owned <sup>(2)</sup>	
	Number	Percent
BlackRock, Inc. and affiliates <sup>(3)</sup> 55 East 52nd Street New York, NY 10055	13,530,763	16.00%
Altiva Management Inc. and affiliates <sup>(4)</sup> 1055b Powers Place  Alpharetta, GA 30009	6,233,796	7.37%
Armistice Capital, LLC and affiliates <sup>(5)</sup> 510 Madison Avenue, 7th Floor New York, NY 10022	5,700,000	6.74%
State Street Corporation and affiliates <sup>(6)</sup> One Lincoln Street Boston MA 02111	5,151,528	6.09%
Point72 Asset Management, L.P. and affiliates <sup>(7)</sup> 72 Cummings Point Road Stamford, CT 06902	4,775,000	5.65%
Eagle Asst Management <sup>(8)</sup> 880 Carillon Parkway St. Petersburg, FL 33716	4,495,365	5.32%
Mark R. Baker <sup>(9)</sup>	1,554,930	1.84%
Bradley L. Campbell <sup>(10)</sup>	69,000	*
Peter J. Crowley <sup>(11)</sup>	460,000	*
Karen J. Ferrante <sup>(12)</sup>	145,000	*

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Michael D. Kishbauch <sup>(13)</sup>	160,342 *
David A. Scheinberg <sup>(14)</sup>	211,182 *
Nicole S. Williams <sup>(15)</sup>	170,000 *
Patrick Fabbio <sup>(16)</sup>	244,125 *
Benedict Osorio <sup>(17)</sup>	41,202 *
Bryce Tenbarga <sup>(18)</sup>	99,300 *
Vivien Wong <sup>(19)</sup>	549,421 *
All directors and executive officers as a group <sup>(20)</sup>	3,704,502 4.21%

\* Less than one percent.

(1) The address of each beneficial owner who is a director or officer of the Company is in care of the Company.

With respect to our directors and executive officers, and except as indicated and/or pursuant to applicable community property laws, each stockholder possesses sole voting and investment power with respect to the shares of common stock listed. The number of shares of common stock beneficially owned includes shares issuable

(2) pursuant to stock options held by the stockholder that are currently exercisable (*i.e.*, within 60 days of April 15, 2019). Shares issuable upon exercise of these options are deemed outstanding for computing the percentage of beneficial ownership of the person holding the options but not of any other person. None of the shares held by our directors and executive officers are pledged as collateral.

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With respect to other stockholders identified above, the percent reported is calculated by dividing (i) the number of shares reported by the stockholder in the Schedule 13G or Schedule 13D filing described in the related note by (ii) the aggregate number of our common shares outstanding on April 15, 2019, and differs from the Percent of Class reported in the stockholder's Schedule 13G or Schedule 13D; it assumes that the stockholder continued to own the number shares reported in its Schedule 13G or Schedule 13D on April 15, 2019.

- Based on a Schedule 13G (Amendment No. 6) filed on January 31, 2019, BlackRock (Netherlands) B.V., BlackRock Advisors, LLC, BlackRock Asset Management Canada Limited, BlackRock Asset Management Ireland Limited, BlackRock Asset Management Schweiz AG, BlackRock Financial Management, Inc.,
- (3) BlackRock Fund Advisors, BlackRock Institutional Trust Company, N.A. and BlackRock Investment Management, LLC acquired the securities reported. According to the Schedule 13G, BlackRock, Inc., in its capacity as a parent-holding company of the foregoing BlackRock funds, has sole voting power over 13,069,292 shares of our common stock and sole dispositive power over 13,530,763 shares of our common stock.

- Based on a Schedule 13D filed on April 5, 2019, Altiva Management Inc., Velan Capital, L.P., Balaji Venkataraman, Dr. Virinder Nohria, LTE Partners, LLC, LTE Management, LLC, Melkonian Capital Management, LLC and Ryan Melkonian acquired the securities reported. According to the Schedule 13D, Velan Capital, L.P., Altiva Management Inc., as general partner of Velan Capital, L.P., and Balaji Venkataraman, as the sole shareholder of Altiva Management Inc., have sole voting and dispositive power over 5,100,000 shares of our common stock, Dr. Virinder Nohria has sole voting and dispositive power over 110,000 shares of our common stock, and LTE Partners, LLC, LTE Management, LLC, Melkonian Capital Management, LLC and Ryan Melkonian have sole voting and dispositive power over 1,023,796 shares of our common stock.
- (4)

- Based on a Schedule 13G (Amendment No. 1) filed on February 14, 2019, Armistice Capital, LLC, Armistice Capital Master Fund Ltd. and Steven Boyd acquired the securities reported. According to the Schedule 13G,
- (5) Armistice Capital, LLC, Armistice Capital Master Fund Ltd. and Steven Boyd share voting and dispositive power over the 5,700,000 shares of our common stock.

- Based on a Schedule 13G filed on February 14, 2019, SSGA Funds Management, Inc., State Street Global Advisors Limited (UK) and State Street Global Advisors Trust Company acquired the securities reported.
- (6) According to the Schedule 13G, State Street Corporation, in its capacity as a parent-holding company of the foregoing State Street funds, shares voting power over 4,872,495 shares of our common stock and shares dispositive power over the 5,151,528 shares of our common stock.

- Based on a Schedule 13G filed on January 2, 2019, Point72 Asset Management, L.P., Point72 Capital Advisors, Inc., Cubist Systematic Strategies, LLC and Steven A. Cohen acquired the securities reported. According to the Schedule 13G, Point72 Asset Management, L.P. and Point72 Capital Advisors, Inc. share voting and dispositive power over the 4,775,000 shares of our common stock, Cubist Systematic Strategies, LLC shares voting and dispositive power over 6,895 shares of our common stock, and Steven A. Cohen shares voting and dispositive power over 4,781,895 shares of our common stock.
- (7)

- Based on a Schedule 13G (Amendment No. 3) filed on January 16, 2019, Eagle Asset Management, Inc.
- (8) acquired the securities reported. According to the Schedule 13G, Eagle Asset Management, Inc. has sole voting and dispositive power over the 4,495,365 shares of our common stock.

- (9) Includes 161,140 shares outstanding and 1,393,790 issuable upon exercise of currently exercisable options.

- (10) Consists of 69,000 shares issuable upon exercise of currently exercisable options.

- (11) Consists of 460,000 shares issuable upon exercise of currently exercisable options.
- (12) Consists of 145,000 shares issuable upon exercise of currently exercisable options.
- (13) Consists of 160,342 shares issuable upon exercise of currently exercisable options.
- (14) Includes 46,182 shares outstanding and 165,000 issuable upon exercise of currently exercisable options.
- (15) Includes 5,000 shares outstanding and 165,000 issuable upon exercise of currently exercisable options.
- (16) Includes 244,125 shares issuable upon exercise of currently exercisable options.
- (17) Includes 21,202 shares outstanding and 20,000 issuable upon exercise of currently exercisable options.
- (18) Includes 99,300 shares issuable upon exercise of currently exercisable options.
- (19) Includes 4,121 shares outstanding and 545,300 issuable upon exercise of currently exercisable options.
- (20) Includes 237,645 shares outstanding and 3,466,857 issuable upon exercise of currently exercisable options held by directors, NEOs, and other executive officers of the Company.

Table of Contents**Equity Compensation Plan Information**

The following table sets forth certain information related to our equity compensation plans as of December 31, 2018.

	<b>Number of shares to be issued upon exercise of outstanding options <sup>(1)</sup></b>	<b>Weighted average exercise price of outstanding options</b>	<b>Number of shares remaining available for future issuance (excluding securities reflected in first column) <sup>(2)</sup></b>
Equity compensation plans approved by stockholders	6,264,288	\$ 6.79	7,742,519
Equity compensation plans not approved by stockholders	-	-	-
Total	6,264,288	\$ 6.79	7,742,519

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Of these shares, 6,208,288 were subject to options granted under the 2005 Plan and 56,000 were subject to options (1) granted under the 2018 Performance Incentive Plan (the "2018 Plan"). No awards other than stock options were outstanding under any of our plans.

All of these shares were available for award grant purposes under the 2018 Plan. Subject to certain express limits (2) of the 2018 Plan, shares available under the 2018 Plan generally may be used for any type of award authorized under that plan including options, stock appreciation rights, stock awards, restricted stock and restricted stock units. No new awards will be granted under the 2005 Plan.

**Item 13. Certain Relationships and Related Transactions, and Director Independence****Certain Relationships and Related Transactions**

We have entered into indemnification agreements with each of our directors and executive and other officers. These agreements require us to indemnify such individuals to the fullest extent permitted by Delaware law for certain liabilities to which they may become subject as a result of their affiliation with us.

Our Code of Business Ethics and Conduct, which our Corporate Governance Guidelines make applicable to all directors and employees, including our CEO and CFO, requires all Progenics personnel to act in the best interests of the Company consistent with their duty of loyalty to it, including by avoiding situations and relationships that involve actual or potential conflicts of interest. Situations that could be perceived as conflicts of interest include related party transactions. Our Code of Business Ethics and Conduct requires our personnel who believe they are involved in or become aware of a potential conflict of interest to discuss the matter with the individual's manager and our General Counsel. Our Audit Committee is required and empowered to meet with our management and independent auditors to review all related party transactions that would be required to be disclosed in our annual proxy statement for potential conflicts of interest situations and, on an ongoing basis, approve such transactions. The Audit Committee's policy is to approve only those transactions that are in the best interests of our stockholders. In addition, our Nominating and Corporate Governance Committee is required and empowered to conduct any and all investigations into alleged violations of our Corporate Governance Guidelines or Code of Business Ethics and Conduct, and present the results of such investigations to our Board.

### **Director Independence**

The Board has determined each of Messrs. Crowley, Kishbauch, and Campbell, Drs. Ferrante and Scheinberg and Ms. Williams to be an "independent director" as such term is defined in Nasdaq Marketplace rules. None of the independent directors of the Company has any relationship, direct or indirect, to us other than as stockholders of the Company or through their service as our directors.

The Board has also determined that each member of the Audit Committee and the Compensation Committee meets the independence standards applicable to those committees prescribed by the Nasdaq Marketplace rules, the SEC and the Internal Revenue Service.

With the assistance of our legal counsel, the Nominating and Corporate Governance Committee reviews the applicable legal standards for Board member and Board committee independence and the criteria applied to determine "audit committee financial expert" status, as well as the answers to annual questionnaires completed by each of our directors. On the basis of this review, the Nominating and Corporate Governance Committee delivered a report to the full Board and the Board made its independence and "audit committee financial expert" determinations based upon the Nominating and Corporate Governance Committee's report and each member's review of the information made available to the Nominating and Corporate Governance Committee.



Table of Contents**Item 14. Principal Accountant Fees and Services**

The following table discloses the fees that EY billed or is expected to bill for professional services rendered to us for 2018 and 2017. There were no audit-related fees billed or expected to be billed during 2018 and 2017.

	<b>2018</b>	<b>2017</b>
Audit Fees <sup>(1)</sup>	\$827,876	\$789,003
Tax Fees <sup>(2)</sup>	\$16,000	\$-
All Other Fees <sup>(3)</sup>	\$1,595	\$2,172

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- In connection with (i) the audit of our annual financial statements, including attestation services required under section 404 of the Sarbanes-Oxley Act of 2002, and reviews of quarterly interim financial statements (\$717,876 in 2018 and \$689,003 in 2017) and (ii) the filing of a replacement shelf registration statement on Form S-3 with the SEC and issuance of comfort letters for at-the-market transactions (\$110,000 in 2018 and \$100,000 in 2017).
- (1) 2018 and \$689,003 in 2017) and (ii) the filing of a replacement shelf registration statement on Form S-3 with the SEC and issuance of comfort letters for at-the-market transactions (\$110,000 in 2018 and \$100,000 in 2017).
- (2) In connection with tax consultation services for the IRC Section 382 analysis (\$16,000 for 2018).
- (3) For proprietary internet-based services (\$1,595 in 2018 and \$2,172 in 2017).

**Pre-Approval of Audit and Non-Audit Services by the Audit Committee**

Audit and non-audit services performed for us by our independent registered public accounting firm must be pre-approved by the Audit Committee in order to assure that the provision of such services does not impair the accounting firm's independence. During the first quarter of each year, the Audit Committee reviews a schedule prepared by the accounting firm of certain types of services to be provided for that year along with projected fees. The Audit Committee reviews the schedule and provides general pre-approval of those types of services. The fee amounts are updated to the extent necessary at regularly scheduled meetings of the Audit Committee. Any additional service proposed to be provided after the annual pre-approval process requires specific pre-approval by the Audit Committee. The Audit Committee may delegate either general or specific pre-approval authority to its chair or any other member(s). The member(s) to whom such authority is delegated must report, for informational purposes only, any pre-approval decisions to the Audit Committee at its next meeting. The Audit Committee approved all services described above during 2018 and 2017.

**PART IV****Item 15. Exhibits, Financial Statement Schedules**

**(a)(3) Item 601 Exhibits**

The exhibits required to be filed by Item 601 of Regulation S-K are listed in the Exhibit Index immediately following the signature page of the Original Filing and in the Exhibit Index below included in this Amendment and incorporated herein by reference:

**EXHIBIT INDEX**

<b>Exhibit Number</b>	<b>Description</b>
31.3	<u>Certification of Mark R. Baker, Chief Executive Officer of the Registrant pursuant to 13a-14(a) and Rule 15d-14(a) under the Securities Exchange Act of 1934, as amended.</u>
31.4	<u>Certification of Patrick Fabbio, Executive Vice President and Chief Financial Officer of the Registrant pursuant to 13a-14(a) and Rule 15d-14(a) under the Securities Exchange Act of 1934, as amended.</u>

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**SIGNATURES**

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

PROGENICS PHARMACEUTICALS,  
INC.

By: /s/ MARK R. BAKER  
Mark R. Baker  
Chief Executive Officer and Director

(Principal Executive Officer)

Date: April 30, 2019